RLPNC 17-4 and 17-5: Products Impact Evaluation of In-service and Short-Term Retention Rates Study

FINAL

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SUBMITTED TO:
Massachusetts Electric Program Administrators and Energy Efficiency Advisory Council Consultants

SUBMITTED BY:
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MA Products Impact Evaluation of In-Service and Short-Term Retention Rates Study

NMR conducted a study to establish estimates of in-service rates (IRS) and short-term retention rates (on average 14.5 months for products respondents and within a year for direct install respondents) for products offered through the Residential Consumer Products Core Initiative and Mass Save® Home Energy Assessment (HEA) Program. The study also examined participant satisfaction with product performance and installation experiences.

Approach

Surveys	Advance Letters + $5 Incentive	Email Reminders	Web Surveys	Response Rates
Products and APS	2,950	2	1,268	43%
Direct Install	1,000	2	250	25%

Key Findings

Dehumidifiers

ISR 99%
Short term Retention 97%
Combined 96%

Dryers

ISR 98%
Short term Retention 99%
Combined 97%

Room Air Cleaners

ISR 100%
Short term Retention 97%
Combined 97%

Showerheads & Adapters

ISR 86%
Short term Retention 91%
Combined 78%

Leave Behind Tier 1 APS

ISR 91%
Short term Retention 94%
Combined 76%

Online Tier 1 APS

ISR 89%
Short term Retention 97%
Combined 86%

Online Tier 2 APS IR+OS

ISR 83%
Short term Retention 94%
Combined 78%

Online Tier 2 APS IR

ISR 81%
Short term Retention 87%
Combined 70%

Customer Satisfaction

82% of respondents stated they were satisfied with product or APS performance

Dehumidifiers	Dryers	Room Air Cleaners	Showerheads & Adapters	Tier 1 APS	Tier 2 APS
99%	96%	91%	75%	81%	70%

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ES Executive Summary

The Program Administrators (PAs) and Energy Efficiency Advisory Council Consultants (EEAC) have contracted NMR Group, Inc. (NMR), to evaluate key Massachusetts-specific impact factors for general products (RLPNC 17-5 General Products Net-to-Gross) and advanced power strips (APS) (RLPNC 17-4 Advanced Power Strip Literature Review and Consumer Survey). The products addressed in this joint study were distributed by the PAs through either the Residential Consumer Products Core Initiative or the Mass Save® Home Energy Assessment (HEA) Program. This document refers to these programs as the *products program* and the *direct install program*, respectively, but we stress that the HEA energy technicians left Tier 1 APS behind during audits and did not install them directly. Thus, the program is the direct install program, but the Tier 1 APS are left behind for customers to install on their own.

The objectives of the study include establishing current estimates of in-service rates (ISRs) and short-term retention rates (on average 14.5 months for products respondents and within a year for direct install respondents[1]) for products currently offered through the program. Process research questions focused on product installation experiences, satisfaction with product performance, and likelihood of recommending the product.[2]

The results are based on web-based surveys of two different populations of PA program participants: (1) those who purchased products via the Mass Save® Website or using a mail-in (or online-submitted) rebate between January 2016 and June 2017, and (2) those who received Tier 1 APS through a direct install program from January to October 2017 (the program did not distribute Tier 2 APS). NMR recruited respondents for the studies using an advance letter sent to randomly selected participants in both programs, providing them with a unique login for the survey and a pre-paid $5 incentive. The survey achieved response rates ranging from 38% to 51% for consumer products and 25% for direct install. NMR additionally conducted literature reviews of products and APS programs to ascertain recent estimates of ISRs in other jurisdictions.[3]

The executive summary presents key findings, conclusions, recommendations, and considerations. The remaining report has three separate sections plus appendices. Section 1 presents the study background and an overview of the approaches taken. Section 2 summarizes the study results on ISR and short-term retention rates. Section 3 addresses information such as customer satisfaction, likelihood of recommendation, motives for purchase and removal, and demographics. A series of appendices provides additional detail on each of these topics.

[1] This length of lag from obtaining the item is most often included in impact evaluations for gross savings.
[2] The literature review and surveys also included net-to-gross research. The results of this research are not presented in this report but instead will feed into a future NTG-focused analysis and report. The scope of work for that study had not been finalized at the time this report was completed.
[3] NMR also explored savings from refrigerator and freezer recycling programs, but these results will be incorporated into the RLPNC 18-1 Appliance Recycling Impact Evaluation, currently being planned.

KEY FINDINGS

Evaluated Impact Factors

Combined ISRs and short-term retention rates range from 75% to 97%, with smaller, easily removed products (APS, showerheads) having lower rates and appliances having higher rates.

Table 1 presents the ISR and short-term retention rates, separately and combined, that were directly measured in this impact evaluation. ISR represents the proportion of all products that were ever installed regardless of whether they remained installed at the time of the survey. Short-term retention measures the percentage of measures ever installed that remained installed at the time of the survey.

The 2016-2018 Massachusetts TRM[4] assumes an ISR of 100% for each of these products and does not directly account for short-term retention. The PAs indicated to NMR that they anticipate applying the combined ISR/short-term retention rate, presented in the last column, in their Annual Report.

As Table 1 shows,

- Combined ISR/short-term retention rates range from a low of 70% for online-purchased Tier 2 APS (70% for Tier 2 APS with Infrared technology (IR) and 78% for Tier 2 APS with Infrared Occupancy Sensing technology (IR+OS))[5] to a high of 97% for dryers and room air cleaners.
- Focusing on ISR alone, only one of the seven measured ISRs (room air cleaners) maintained the TRM assumption of 100%, although clothes dryers and dehumidifiers came very close at 98% and 99%, respectively. ISR ranged from 81% to 100%.
- Short-term retention rates range from a low of 91% to a high of 99%. The survey did not distinguish why respondents removed products, so we cannot determine how many stopped working (and would then be captured under effective useful life, not addressed in this study) or removed for other reasons.
- Massachusetts ISR alone and combined ISR/short-term retention rates do not show a consistent pattern in comparison to the ISR ranges found in the literature (some jurisdictions fold ISR and retention together, although the reports do not regularly specify if they do so). Massachusetts sometimes falls within or near literature ranges and point estimates, sometimes above and sometimes below.

[4] http://ma-eeac.org/wordpress/wp-content/uploads/2016-2018-Plan-1.pdf

[5] While multiple technological differences exist between the two Tier 2 APS technologies, for the sake of simplicity, we use Infrared (IR) and Infrared-Occupancy Sensing (IR+OS) as the defining terminology to distinguish between strip types throughout this report. The evaluation team chose the terminology because the presence of an occupancy sensor is a clear technological difference and to remain consistent with previous literature (for example, see: "Energy Savings of Tier 2 Advanced Power Strips in Residential AV Systems," *Prepared for Pacific Gas and Electric by AESC, Inc.* (Feb 2016).

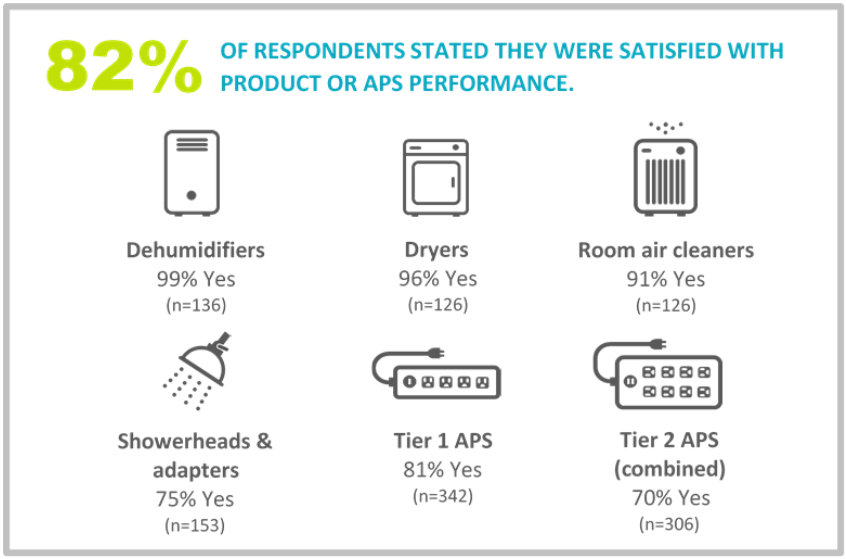
Table 1: Evaluated ISR and Short-term Retention Rates

Product Name	MA Primary Research				Literature Range
	Sample Size	ISR	Short-term Retention	Combined	
Low to Moderate Price Measures					
Leave behind Tier 1 APS	252	81%	94%	76%	42% - 86%
Online Tier 1 APS	359	89%	97%	86%	80%
Online Tier 2 APS IR+OS	60	83%	94%	78%	80% - 87%
Online Tier 2 APS IR	280	81%	87%	70%	
Online Tier 2 APS All	340	82%	91%	75%	
Dehumidifiers	137	99%	97%	96%	94%
Room Air Cleaners	126	100%	97%	97%	100%
Temperature Sensitive Showerheads, Adapters	178	86%	91%	78%	N/A
High Price Measures					
Dryers	128	98%	99%	97%	N/A

* Note that two dyers had never been installed and one was removed. While we do not have further details on the two never installed, the respondent who removed one plans to reinstall it in the future.

Customer Experience

Overall, 82% of respondents who purchased products through the program voice satisfaction with product performance and similar percentages say they would recommend the products Customers voice relatively high levels of satisfaction with all the products, but the results vary, as the discussion below and Section 3.2 explain.



Purchasers of online APS and showerhead products voice lower levels of satisfaction compared to appliance purchasers, with Tier 2 APS purchasers being the least satisfied. About three-quarters of leave behind Tier 1 APS recipients (74%, not shown in figure, which is based on product purchasers only) said they were satisfied with the performance of their APS, which is significantly lower (statistically) than online Tier 1 APS respondents (81%).

Respondents who removed APS (both tiers and program delivery modes) and showerheads from service voice skepticism about whether they will reinstall the products. While a minority of all respondents removed APS and showerheads, among removers, 22% of online Tier 1 APS, 42% of online Tier 2 APS, 50% of leave behind Tier 1 APS, and 69% of showerhead have no plans to reinstall the devices.

Respondents who received leave behind Tier 1 APS through the direct install program self-reported which devices they had installed in the control, switched, and always on outlets in their device (Section 2.1.1). Respondents used an average of 4.1 outlets. Most of the units delivered by the program had a seven-outlet design, with two always on outlets, one control outlet, and four switched outlets. The always on outlets were most frequently in use (85%), followed by control outlets (80%) and switched outlets (40%). These percentages already imply less than optimal use of many leave behind Tier 1 APS, a closer look at the self-reported devices plugged into each confirms this. Only 25% of control outlets had televisions and 11% computers plugged into them, which are the optimal electronics for this type of outlet. In contrast, 19% of always on outlets had televisions and 11% had computers. Thus, respondents remain confused about how to use the APS to optimize efficiency and reduce plug load. Switched outlets had a wide variety of devices plugged into them, most of which are appropriate for such locations.

RECOMMENDATION, CONSIDERATION, AND GUIDANCE

Recommendation

Recommendation 1: The PAs should use the combined Massachusetts ISR/short-term retention rates listed in Table 1 for the 2017 Annual Report, the 2018 Annual Report, updates to the TRM, and program planning for 2019 to 2021 for all evaluated products.

> *Rationale: The evaluated results are based on recent participants and strong sample sizes. Ideally, the PAs and EEAC would update these rates during the 2019 to 2021 program cycle.*

Consideration

Consideration 1: The PAs and EEAC consultants should expand and revise their efforts to educate Tier 1 and Tier 2 APS program participants in all three delivery modes (upstream, online, and leave behind) regarding the optimal set-up of the devices for efficiency and reducing plug load.

> *Rationale: Respondents voiced concerns about Tier 1 and Tier 2 APS not functioning properly or being difficult to set up. Those receiving leave behind Tier 1 APS also self-reported less-than-optimal set-up of the devices. These results collectively suggest that consumers remain confused about how to best use APS. Therefore, we recommend that the PAs and EEAC consider expanding and revising their APS educational materials. NMR believes it is safe to generalize this recommendation to upstream APS purchasers as well, even though they were not surveyed for this study.*

Guidance for Future Study Planning

Guidance 1: The PAs should consider conducting online or in-person focus groups with APS online purchasers and leave behind recipients to learn more about understanding and use of the measures by different demographic groups. The results could inform program education, outreach, and marketing.

> *Rationale: The survey results indicate a great deal of confusion about how best to use Tier 1 and Tier 2 APS to optimize plug load reduction. Additionally, as discussed in* Section 3.3*, the results suggest that younger, renting customers exhibit higher Tier 1 APS ISRs and short-term retention – and higher FR too – compared to other respondents. Focus groups could provide insights into the greater APS acceptance of younger customers that may help increase the device's adoption among other demographic groups. The study design could consider using online focus groups or group video chats as well as in-person focus groups to include a wide variety of participants with different preferred methods of sharing information.*

Guidance 2: Future surveys that address retention should consider exploring the reasons for removal, to distinguish between removals for failure/breakage (which then get factored into effective useful life) versus other reasons for removal (which remain retention).

> *Rationale: The current survey did not distinguish why respondents removed products, so we cannot determine how many stopped working, which means accounting for short-term retention and EUL for lifetime savings could lead to a small amount of double-discounting of savings.*

1 Section 1 Background and Methods

The Residential Consumer Products Core Initiative (the products program) seeks to increase customer adoption of various energy-efficient measures by offering rebates on select products.[6] The PAs and EEAC consultants directed NMR to examine in-service rates (ISR) and short-term retention rates (defined below) as part of the study. Later, the PAs and EEAC consultants decided to field a similar study for advanced power strips (APS), delivered as leave behind measures through the Home Energy Assessment (HEA) Direct Install Program (direct install program).

1.1 Program Descriptions

The PAs implement the products program using the following three approaches:

1. **Upstream**: incentives are paid directly to manufacturers and retailers who in turn lower the shelf price of supported measures.
2. **On-line sales**: customers purchase discounted products through an online catalog.
3. **Mail-in rebates**: customers purchase goods from a retailer and then submit a mail-in or online rebate form to receive a check to offset a portion of the original price.

The PAs also offer various direct install programs aimed at different sections of the residential population. This study focused on the HEA program, which targets residents in single-family homes (including two-to-four-unit buildings). This direct install program distributed free Tier 1 APS to qualified households, directing the energy specialists to leave the APS behind and not install them.

[6] The Appliance Recycling program also falls under the same core initiative. NMR is currently working with the PAs and EEAC consultants to plan the RLPNC 18-1 Appliance Recycling Impact Evaluation. Likewise, the surveys completed for 17-4 and 17-5 also included NTG elements, which will be addressed in 18-3 Products NTG, currently being planned.

Table 2 lists the products supported through the approaches and addressed in this study. Most of the products addressed in the literature review only are not currently supported by the program.

Table 2: Products Currently Supported by Delivery Method

Product	Upstream	On-line	Mail-in	Leave Behind
Addressed in Surveys and Literature Review				
Tier 1 APS	X	X		X
Tier 2 APS IR+OS	X	X		
Tier 2 APS IR	X	X		
Dehumidifiers			X	
Dryers			X	
Room Air Cleaners	X		X	
Temperature Sensitive Showerheads / Adapters	X	X		
Addressed in Literature Review Only				
Clothes Washers			After HEA	
Dishwashers				
Freezers				
Pool Pumps	X			
Refrigerators			After HEA	
Room Air Conditioners			X	
Showerheads, Low Flow	Fundraiser[2]			

[1] Some measures require a home energy assessment for rebate eligibility.
[2] Offered as a fundraiser product.

1.2 PARTICIPANT SURVEY

The results presented in this report are based on web surveys of 1,268 consumer products participants and 250 direct install program participants. NMR fielded the consumer products survey in October and November of 2017, and the direct install survey in January 2018. Table 3 presents the sample design, as well as the participation periods, response rates, and sampling error. Appendix A provides more detail on survey recruitment.

The smaller response rate for the Tier 1 APS distributed through the direct install program likely stems from their leave behind status, compared to online respondents who sought out and purchased the APS, making online purchasers more engaged with the product and the survey. This difference may suggest possible non-response bias – leave behind APS recipients who answered the survey may differ from those who did not. Mail-in rebate users with *listed* email addresses also responded disproportionately higher than those lacking listed email addresses (Table 12). Given the high incidence rate of email access generally, it is likely that nearly all mail-in rebate users have email addresses but declined to list them on their rebate form. Therefore, we acknowledge this potential source of bias but do not believe it adversely affected the results.

Table 3: Sample Design and Response Rates

	Participation Period[1]	Products	Households			
		Population	Population	Sample	Response Rate[2]	Sampling Error
Leave Behind Tier 1 APS[3]	Jan. to Nov. 2017	76,665	54,213	250	25%	7%
Online Tier 1 APS	Jan. 2016 to Jun. 2017	1,459	903	359	45%	6%
Online Tier 2 APS IR+OS		164	133	60	47%	15%
Online Tier 2 APS IR		900	611	280	46%	7%
Dehumidifiers		11,098	10,880	137	41%	10%
Dryers		5,806	5,797	128	39%	10%
Room Air Cleaners		1,954	1,922	126	38%	10%
Temperature Sensitive Showerheads and Adapters		747	677	178	51%	9%

[1] Based on EFI invoice dates. Actual participation dates vary.
[2] Response rate = Sample/(Number of Mailers – Number of Returned Mailers).
[3] Distributed as part of the Home Energy Assessment program. Unlike the leave behind APS, most measures distributed by the program are directly installed or obtained post-assessment via a rebate program.

1.3 LITERATURE REVIEW

NMR reviewed approximately 32 different evaluation reports, technical reference manuals (TRMs), and program plans from across the nation to identify ISRs and short-term retention rates for APS and select consumer products. We only report values obtained through primary research and completed since 2014, rejecting deemed or negotiated values and older studies. We examined findings for the products addressed in the Participant Survey, but also for a wider range of products commonly supported by product programs across the nation or discussed in the RLPNC 16-10 What's Next for Products Study.[7] Table 4 lists all of the products addressed in the literature review.

Table 4: Products Addressed in Literature Review and Survey[1]

Products	Literature	Survey
Low to Moderate Price		
Tier 1 APS[2]	X	X
Tier 2 APS	X	X
Dehumidifiers	X	X
Room Air Cleaners	X	X
Room Air Conditioners	X	
Temperature Sensitive Showerheads and Adapters		X
Low-flow Showerheads		
High Price		
Clothes Washers	X	
Dishwashers	X	
Dryers		X
Freezers	X	
Pool Pumps	X	
Refrigerators	X	

[1] The literature review also examined appliance recycling programs, but these will be reported in the RLPNC 18-Appliance Recycling Impact Evaluation, currently being planned.
[2] Distributed through a variety of approaches.

1.4 ANALYSIS METHODS

For the products addressed in the Participant Survey, NMR estimated ISRs and short-term retention rates, and combined these into a single rate to be used in the estimation of gross energy and demand savings. By consensus, we agreed to develop the categories based on price (Table 5).

[7] NMR Group. 2018. *RLPNC 16-10 What's Next for Products*. http://ma-eeac.org/wordpress/wp-content/uploads/RLPNC-16-10-What-Is-Next-for-Products-Market-Scan.pdf (Feb. 9, 2018).

NMR calculated the ISR for each measure in both programs using the following equation:

$$ISR = \frac{Total\ ever\ installed}{Total\ purchased}$$

Where *Total ever installed* includes all products that were ever installed regardless of whether they remained installed at the time of survey and *Total purchased* is the sum of survey respondent products purchased or left behind through the program.

The team also calculated short-term retention using the following equation:

$$Short-term\ Retention = \frac{Still\ installed}{Total\ ever\ installed}$$

Where *Still installed* are all the products that are still installed during the time of the survey.

NMR calculated ISRs and short-term retention rates using the same approach for mail-in, online, and leave behind products. The study bases short-term retention on the answers of all survey respondents regardless of how long they have had their measures. For products respondents, the average was 14.5 months, while all direct install respondents had their devices for less than a year. Appendix A presents more detail on the elapsed time between respondents obtaining measures and NMR fielding the surveys.

NMR also analyzed survey results covering process-related questions, such as installation experiences, satisfaction, and likelihood to recommend the product. We do not do the same for ISR or short-term retention, as it is unlikely that the PAs will apply different assumptions in the TRM based on manufacturer.

2 Section 2 In-service Rates and Short-term Retention

This section reports evaluated ISR and short-term product retention – and the combined rate – for the study measures distributed through the products and direct install programs. We compare the survey results with estimates derived from a literature review of studies in other jurisdictions (Appendix C lists the sources), with the literature review covering a wider variety of products. The ISR tables are categorized by product shelf-price, as agreed by consensus.

2.1 In-service Rate

Table 5 provides a summary of evaluated ISR values and those found in the literature. We define ISR as the percentage of products obtained that were ever installed, regardless of whether they were still installed at the time of the survey.

The literature suggests – and the survey results confirm – that ISRs tend to be 90% or higher for both large (e.g., dryers) and small (e.g., room air cleaners) appliances. Specifically, the survey found the ISR to be 98% for dryers, 99% for dehumidifiers, and 100% for room air cleaners. In contrast, APS and low-flow showerheads exhibited a wide range of values in the literature (42% - 86% for Tier 1 APS and 30% - 100% for low flow showerheads),[8] but fell in the 80% to 90% range for survey respondents. For online Tier 1 APS, the MA primary research found an ISR of 89%, above that of the literature median for similarly delivered Tier 1 APS (80%). The Tier 2 APS IR+OS ISR was 83%, equal to that of the literature median (83%). The Tier 2 APS IR ISR was slightly lower at 81%.[9] Temperature sensitive showerheads and adapters both have ISRs of 86%, for which there is no direct literature comparison.

Though discussed in greater detail in Section 3.3, disaggregating the ISR and short-term retention figures for APS respondents reveals statistically higher levels of both quantities measured among apartment-dwellers (5+ units), renters, and those under 30 years old.

[8] Some jurisdictions include short-term retention as part of the ISR, making the ISR appear lower than how ISR is defined in MA. See Section 2.3 for the combined short-term retention/ISR rate.
[9] Tier 2 APS IR+OS and Tier 2 APS IR ISR are not statistically significantly different at the 90 or 80 percent confidence levels.

Table 5: In-Service Rate (ISR) Comparison

Product Name (Sample Size)	MA Primary Research ISR (CI)[1]	Literature Review			
		ISR Range	Median	Study Count	Sources[10]
Low to Moderate Price Measures					
Leave Behind Tier 1 APS (250)	81% (77%, 85%)	42% - 86%	78%	5 studies; 6 values	OK 2016; NM 2016; MO Ameren 2014; PA ADM 2013-14; LA 2012-13
Online/Downstream Tier 1 APS (359)	89% (87%, 92%)	80%	80%	1 study	Ontario 2015
Online Tier 2 APS IR+OS (60)	83% (75%, 91%)	80% - 87%	83%	2 studies with 3 values	CA SDG&E 2014-15; CA PG&E & SDG&E 2014-15
Online Tier 2 APS IR (280)	81% (77%, 85%)				
Online Tier 2 APS All (340)	82% (78%, 86%)				
Dehumidifiers (137)	99% (98%,100%)	94%	94%	1 study	Eff ME 2014
Room Air Cleaners (126)	100% (100%, 100%)	100%	100%	1 study	Ameren IL 2014
Room Air Conditioners	N/A	100%	100%	1 study	Ameren IL 2014

[10] Please refer to Appendix C for full citations of these sources.

Product Name (Sample Size)	MA Primary Research ISR (CI)[1]	Literature Review			
		ISR Range	Median	Study Count	Sources[10]
Showerheads & Adapters, Temperature Sensitive (178)	86% (82%, 91%)	N/A	N/A	N/A	N/A
Showerheads, Low Flow	N/A	30% to 100% Direct install 60%-100% Kits/leave behind 30%-86%	55%	5 studies; 10 values	PA MEC 2016; WI FOE 2016; Public Service Co NM 2015; PA PPL 2015; Ameren MO 2014
High Price Measures					
Clothes Washers	N/A	98%	99%	1 study	Eff ME 2014
Dishwashers[2]	N/A	99%-100%	99%	1 study; 3 values	CA PUC 2010
Dryers (128)	98% (97%,100%)	N/A	N/A	N/A	N/A
Freezers	N/A	97%	97%	1 study	PA MEC 2016
Pool Pumps[2]	N/A	97%-99%	98%	1 study; 2 values	CA PUC 2010
Refrigerators	N/A	97% - 97%	97%	2 studies	PA MEC 2016; Eff ME 2014

[1] Confidence interval shown in parentheses.
[2] NMR could not locate studies more recent than 2010 that addressed dishwasher and pool pump ISRs.

2.1.1 Leave Behind Tier 1 APS Use

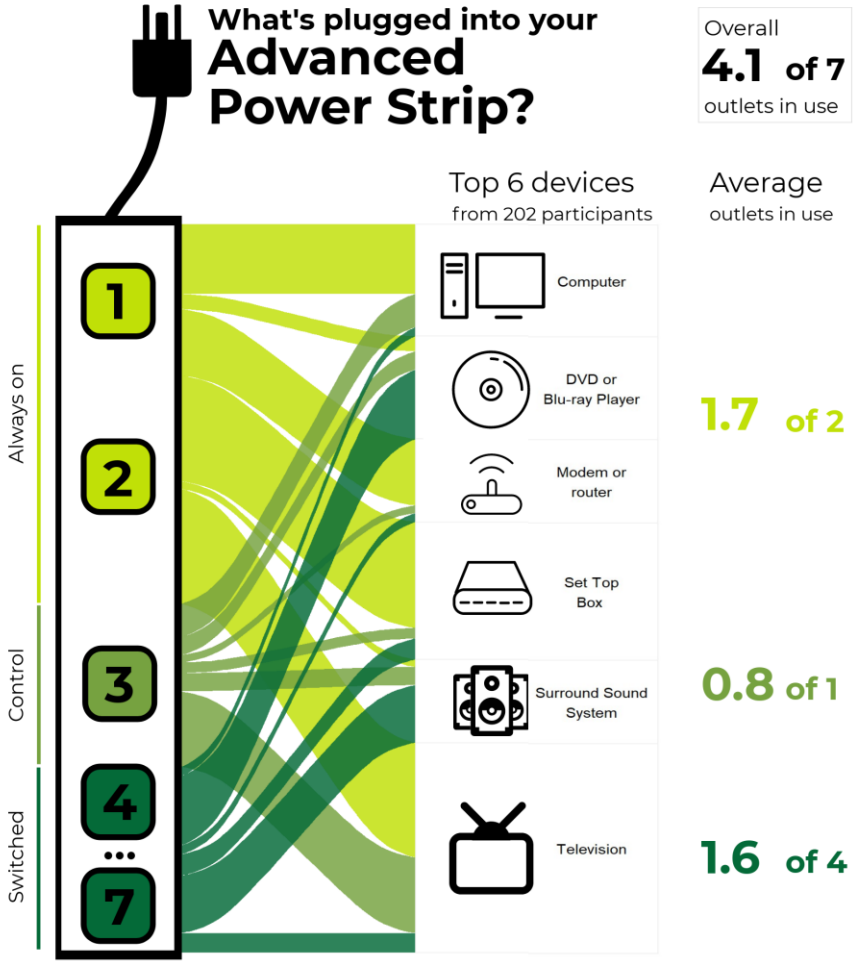
The direct install survey asked respondents to report how they were using the different Tier 1 outlets to manage their devices. The *control* outlet cuts power to the *switched* outlets when the control device is turned off. The *always on* devices draw power no matter the state of the control outlet. A correct television set-up would have the television in the control outlet, surround sound, DVD and Blu-ray players, and gaming systems in the switched outlets, and the cable set-top box and DVR in the always on outlet. A correct home office set-up would have the computer in the control outlet, the printer and monitor in the switched outlet, and the modem or router in the always on outlet.

Overall, respondents reported an average of 4.1 outlets in use. Most of the units left behind by the program were seven outlet models with one control outlet, two always on outlets, and four switched outlets. The always on outlets were most frequently used (85%), followed by control (80%) and switched outlets (40%). This finding suggests that many households are not using the APS optimally, as the rate of always on outlet use is higher than control outlet or switched outlet use.

Figure 1: shows the six most common devices that were plugged into the three types of APS outlets. The devices most frequently connected to the outlets that are always on were televisions (19%), set top boxes (17%), computers (11%), and routers (11%).[11] For most uses, set-top boxes and routers should be in the always on outlet, but televisions and computers usually are best installed in the control outlet. In fact, televisions (25%) and computers (11%) were the devices most often plugged into the control outlet. The switched outlets contained a variety of devices, with the three most common including DVD or Blu-ray players (6%), surround sound systems (5%), and gaming systems (4%), which are all considered optimal devices for this type of outlet. In summary, it appears that direct install respondents are over using the always on outlet which leads to under use of the control outlet – and suboptimal management of plug load.

[11] The percent values provided represent percent of all devices connected to each outlet type. For example, 19% of devices connected to “always on” outlets were televisions.

Figure 1: Uses for Leave Behind Tier 1 APS by outlet type



2.2 SHORT-TERM RETENTION

The literature review did not extract information on short-term retention rates and this measure is not currently included in the MA TRM,[12] but NMR did address them in the participant surveys. Table 6 provides a summary of short-term retention results from the participant surveys. As a reminder, respondents had had the average consumer product about 14.5 months and the leave behind APS less than 12 months at the time of the survey (see above and Appendix A for more detail). For the purposes of this study, we define short-term retention as the proportion of products ever installed that remained installed at the time of the survey. Note that the survey did not ask why households removed products, so we are unable to tease out product failure (captured by effective useful life [EUL]) from other reasons for removal (renovations, move, dissatisfied, etc.). The surveys found short-term retention to be high for leave behind Tier 1 APS (94%), online Tier 1 APS (97%), online Tier 2 APS IR+OS

[12] Short-term retention rates could be embedded in the ISR from other regions in the literature review studies. See Section 2.3 below for combined ISR/short-term Retention.

(94%), dehumidifiers (97%), dryers (99%), and room air cleaners (97%). Therefore, if respondents install these products, they tend to remain installed. The short-term retention rates were somewhat lower for temperature sensitive showerhead products (91%) and online Tier 2 APS IR (87%).[13]

Table 6: Short-term Retention

Product Name	Sample Size	MA Primary Research Short-term Retention
Low to Moderate Price Measures		
Leave behind Tier 1 APS	252	94%
Online Tier 1 APS	359	97%
Online Tier 2 APS IR+OS	60	94%
Online Tier 2 APS IR	280	87%
Online Tier 2 APS All	340	91%
Dehumidifiers	137	97%
Room Air Cleaners	126	97%
Showerheads and Adapters, Temperature Sensitive	178	91%
High Price Measures		
Dryers	128	99%

2.3 COMBINED ISR AND SHORT-TERM RETENTION

Table 7 lists the combined ISR and short-term retention rate for products included in the participant surveys and compares them to individual ISR and short-term retention rates and the literature range for ISR, given that some jurisdictions refer to this combined rate as ISR. Here, we find that the combined ISR/short-term retention rates for Massachusetts fall within the literature range for leave behind Tier 1 APS (76% for Massachusetts compared to 42% to 86% for other areas). They are below the literature range for online Tier 2 APS (IR+OS is 78% and IR is 70% for Massachusetts[14] compared to 80% to 87%), above the single recent literature value for online Tier 1 APS (86% vs. 80%) and dehumidifiers (96% vs. 94%), and below the single recent literature value for room air cleaners (97% vs. 100%). **As noted in the Executive Summary, NMR recommends the PAs use the evaluated combined rates for 2017 and 2018 Annual Reporting and TRM revisions.**

[13] Online Tier 2 APS IR+OS and Online Tier 2 APS IR short-term retention are statistically significantly different at the 90 percent confidence level.
[14] Online Tier 2 APS IR+OS and Online Tier 2 APS IR combined ISR and short-term retention are not statistically significantly different at the 90 or 80 percent confidence levels.

Table 7: Evaluated ISR and Short-term Retention Rates

Product Name	MA Primary Research				Literature Range
	Sample Size	ISR	Short-term Retention	Combined	
Low to Moderate Price Measures					
Leave behind Tier 1 APS	252	81%	94%	76%	42% - 86%
Online Tier 1 APS	359	89%	97%	86%	80%
Online Tier 2 APS IR+OS	60	83%	94%	78%	80% - 87%
Online Tier 2 APS IR	280	81%	87%	70%	
Online Tier 2 APS All	340	82%	91%	75%	
Dehumidifiers	137	99%	97%	96%	94%
Room Air Cleaners	126	100%	97%	97%	100%
Temperature Sensitive Showerheads, Adapters	178	86%	91%	78%	N/A
High Price Measures					
Dryers	128	98%	99%	97%	N/A

3 Section 3 Customer Experiences

In addition to the ISR and short-term retention values outlined in Section 2, the current research assessed the ease of APS installation by brand and tier type, and performance satisfaction, and respondents' likelihood of recommending all products. For both products and APS, we recorded whether respondents intend to reinstall a product they had uninstalled and, if not, their reasons for not wanting to reinstall the product. Similarly, we asked respondents to provide a reason they indicated they would be extremely likely or unlikely to recommend the product.

Throughout, we present the findings in three groups: APS, appliances (i.e., dehumidifier, dryers, room air cleaners), and temperature sensitive showerheads.

3.1 Product Installation Behavior

This section takes a closer look at product installation behavior and intention to install or reinstall measures not currently in service. ***The percentages noted are based on respondents, so they differ slightly from the combined product installation and retention rates discussed in*** Section 2.1.[15]

3.1.1 Advanced Power Strip Installation Behavior

Figure 2 provides more insights into how respondents treated the installation of the online Tier 1 APS they obtained (and some obtained more than one, hence the slight differences in rates reported above). Over three-fourths (79%) of respondents have installed all the APS units they received from the program, while another 15% indicated they had never installed any of their APS. A small share (6%) of respondents indicated they had installed and removed at least one of their APS. About one-fourth of removers (22% of removers, 1% of all purchasers) have no plans to reinstall, mostly because they did not find the APS to work as expected/properly or meet their needs.

Compared, to online Tier 1 APS respondents and as expected given the differences in installation and retention rates, online Tier 2 APS had a lower share of respondents with currently installed APS (67%) and higher shares of respondents who never installed (20%) and who installed and removed (12%) the devices, shown in Figure 3. Intuitively, Tier 2 APS require more knowledge of the device to set up and install which may lower the ISR, despite their higher price (which usually increases measure installation). Additionally, more removers (42% of removers, 5% of all purchasers) have no plans to reinstall; as with Tier 1 respondents, this is primarily because they did not find the APS worked for their needs, was

[15] For example, the combined installation and retention rate for online Tier 2 APS units is 71% (81% x 88%). The percentage of respondents with Tier 2 APS installed is 67% because some respondents bought more than one Tier 2 APS.

not what they expected, or did not function properly.[16] Table 16, in Appendix B lists respondents' reasons for APS removal.

Figure 2: Online Tier 1 APS Installation (n=357)

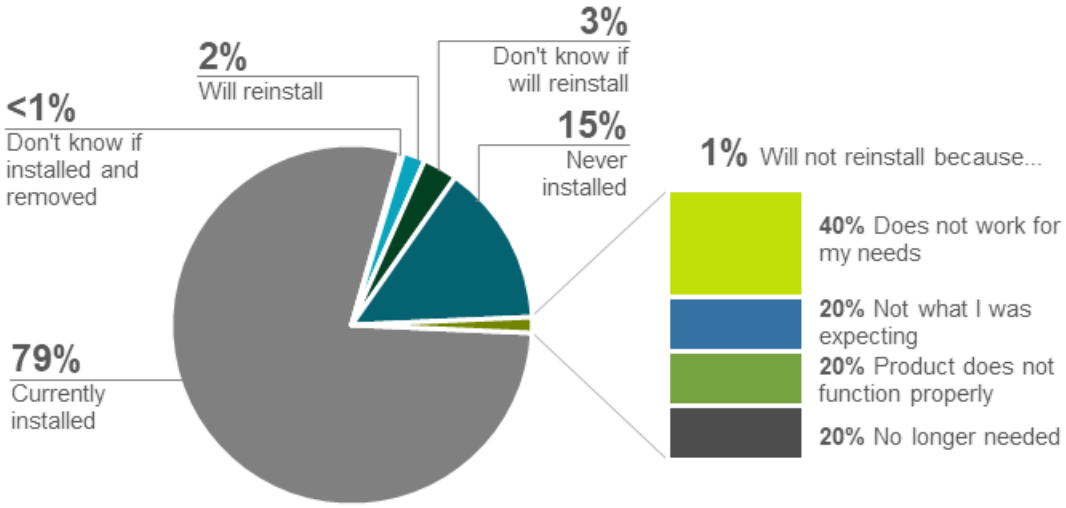


Figure 3: Online Tier 2 APS Installation (n=338)

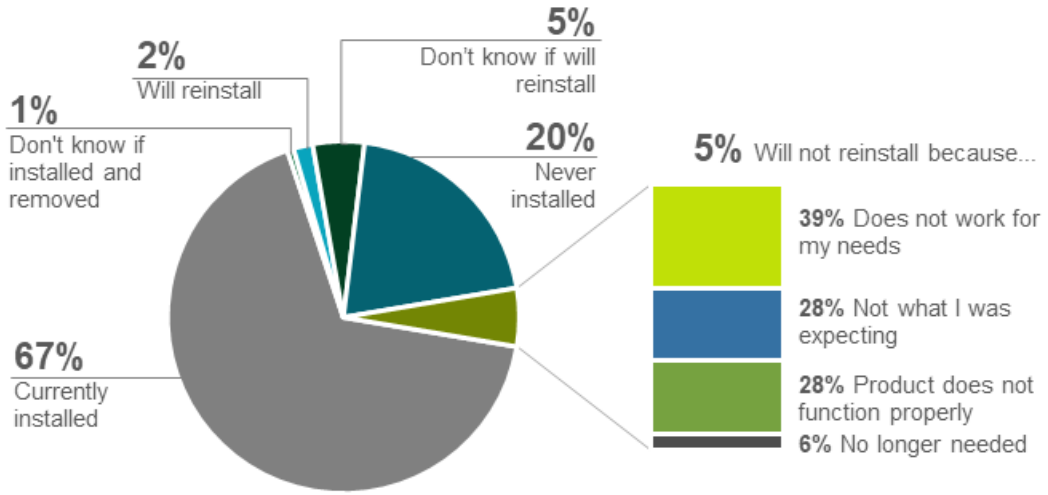
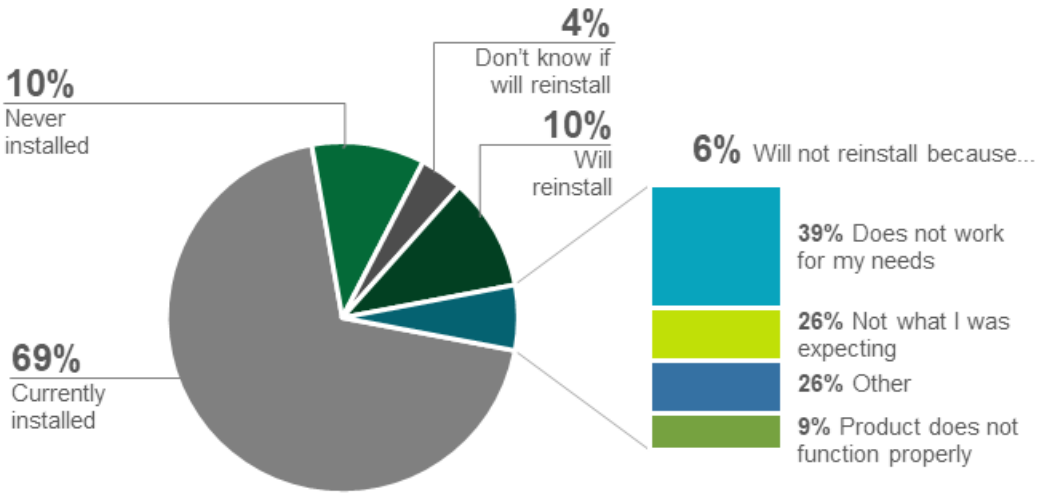


Figure 4 shows whether leave behind APS respondents had installed, partially installed, or never installed the Tier 1 APS that they received from an energy specialist during an HEA conducted in their homes. Over two-thirds (69%) of respondents still have their APS installed, while one-fifth (20%) had installed and removed one or more of their APS. One-tenth (10%) of respondents indicated they never installed any of their APS. Of those who removed them

[16] The analysis of leave behind Tier 1 APS and open-ended responses suggest that many respondents did not set the unit up properly, but others may have legitimate concerns about function. For example, one customer noted his Tier 2 APS registered his highly efficient television as *off* if he did not interact with the TV (e.g., change channels) but was still watching it.

from service, 50% (10% of all respondents) will reinstall, 20% (4% of all respondents) are uncertain whether they will reinstall, and 30% (6% of all respondents) will not reinstall.

Figure 4: Leave Behind Tier 1 APS Installation (n=250)

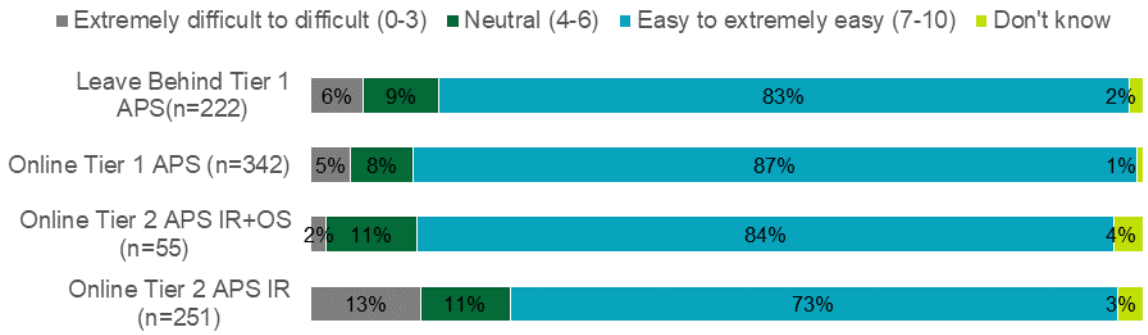


3.1.1.1 Advanced Power Strip Installation Experience

Most respondents found the Tier 1 and Tier 2 APS to be easy to install regardless of model or delivery method as shown in Figure 5. However, online Tier 2 IR APS respondents (73%) were less likely to have found the installation easy than online Tier 2 IR+OS APS respondents (84%).

Figure 5: APS Installation

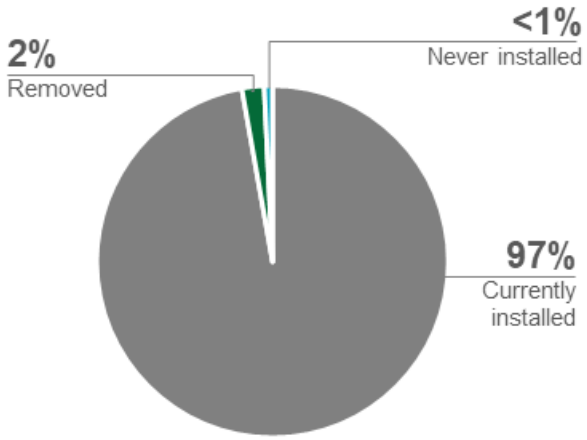
The APS installation was…



3.1.2 Appliance Products Installation Behavior

Figure 6 shows that of the 391 respondents who purchased either dryers, dehumidifiers, or room air cleaners through the Mass Save program, 97% of products are currently installed, 2% were installed and later removed, and 0.7% had never been installed. Of the 2% of respondents who uninstalled their products, only two dehumidifier respondents indicated they did not plan to reinstall their product. When prompted, one dehumidifier respondents stated he or she no longer needed it, and another stated the dehumidifier did not function properly.

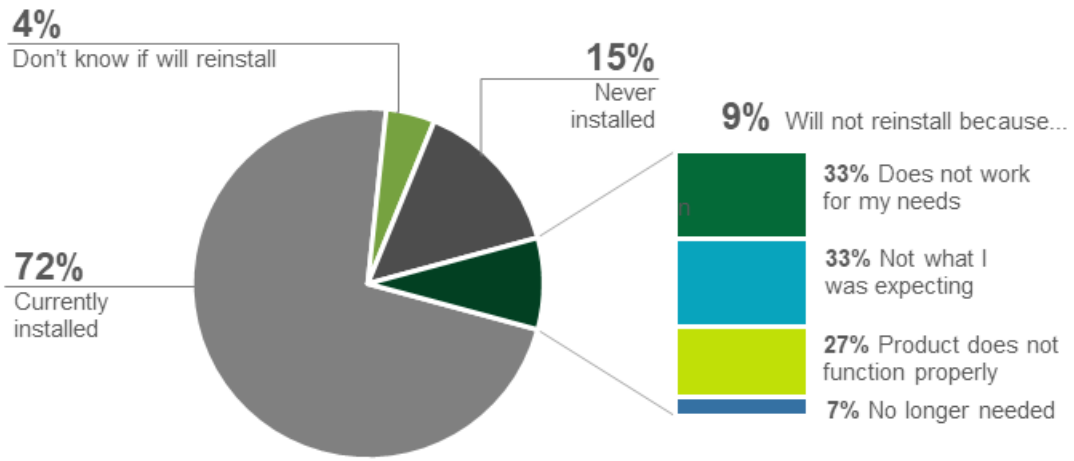
Figure 6: Appliance Product Installation (n=391)



3.1.3 Temperature Sensitive Showerhead Installation Behavior

Temperature sensitive showerhead installation rates (shown in Figure 7) were like those of the APS respondents, with 72% of showerheads still installed and 15% having never been installed. Nine percent of respondents (69% of removers) indicated they will not reinstall. Their reasons were evenly split between the product not meeting their needs, not being what they expected, or not functioning properly. Table 16 of Appendix B lists the respondents' reasons why the showerheads were originally removed.

Figure 7: Showerheads Installation (n=178)



3.2 Product Satisfaction

Dryers, dehumidifers, and room air cleaners had the highest rates of respondent satisfaction among the products (Figure 8). Almost all dehumidifier respondents (99%) indicated satisfaction with the product's performance (4 or 5 rating on a scale of 1 to 5). Three-fourths of showerhead product respondents indicated they were satisfied with the performance. Online Tier 1 APS respondents indicated higher satisfaction levels than Online Tier 2 APS respondents (81% compared to 70%). Survey results show that 82% of respondents across

all measures were satisfied with the performance of their product or APS. The direct install survey found that 74% of 222 respondents were satisfied with the leave behind Tier 1 APS performance (not shown in the figure), significantly lower than online Tier 1 APS respondents.

Figure 8: Product or Online APS Performance Satisfaction (n=1,189)

(Rating of 4 or 5 on a scale of 1 to 5)

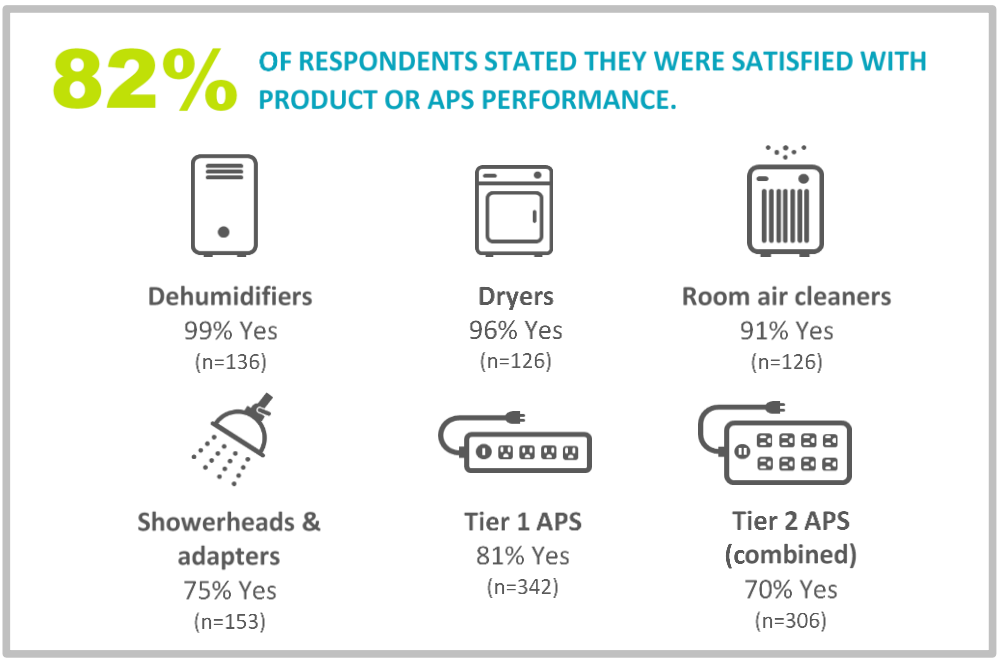


Figure 9 shows the likelihood that a respondent would recommend their product or APS to someone else. A large majority of appliance product respondents indicated they are likely or extremely likely to recommend the product to others (96% for dehumidifiers, 93% for dyers, and 89% for room air cleaners). The likelihood to recommend showerheads was lower, at 76%. About three-quarters of online Tier 2 APS respondents receiving either brand say they would be likely to recommend the products, leave behind Tier 1 APS respondents are significantly less likely (75%) than online Tier 1 APS (81%) respondents to say they would recommend the product.

Figure 9: Product or APS Recommendation Based on Performance

How likely are you to recommend this product or APS to someone else?

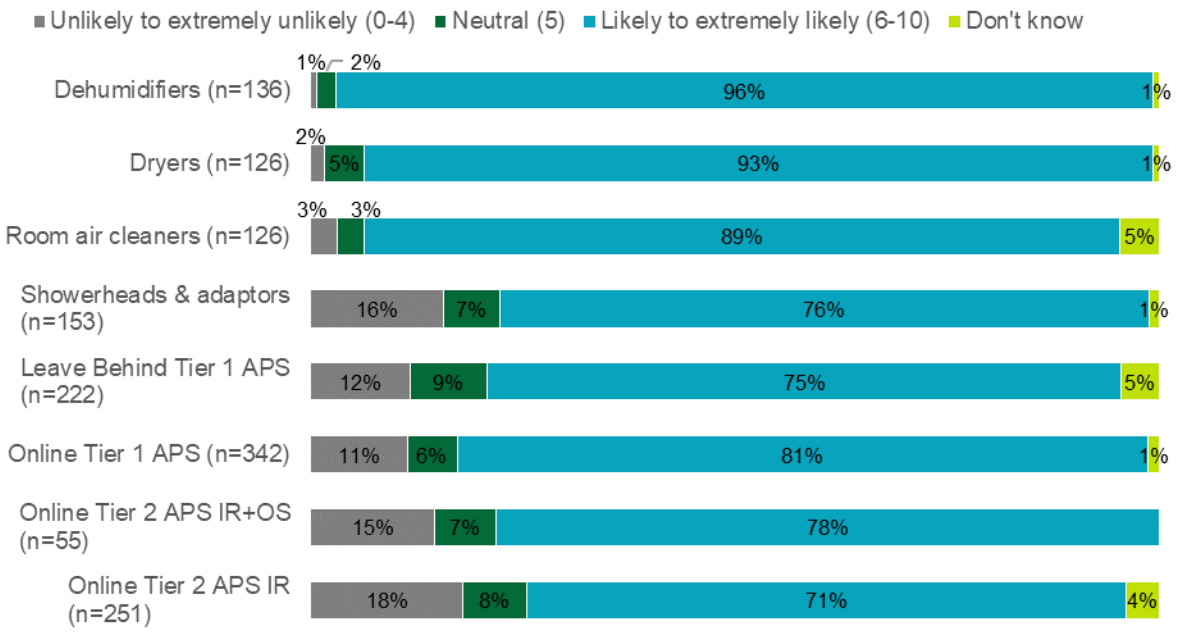


Figure 10 lists the primary reasons online Tier 1 APS respondents would be likely or unlikely to recommend the APS to someone else. Saving energy is the most frequently mentioned reason why they would likely recommend the APS to someone else (43%), followed by saving money on bills (22%), the product works well (14%), and is easy to use (14%). About one-quarter of respondents who indicated they would not recommend the APS found that it was confusing to set up or use (25%), while others had issues with functionality (19%) and did not work well with existing equipment (16%). Reasons for recommendation did not vary between online Tier 1 and online Tier 2 APS, as verified in Figure 11. However, more online Tier 2 respondents claimed their APS was confusing to set up or use (35% of Tier 2 compared to 25% of Tier 1 purchasers who would not recommend), turns off devices while they are in use (20% of Tier 2 compared to 3% of Tier 1 purchases who would not recommend), or did not work well with existing equipment (16% of Tier 1 compared to 4% of Tier 2 purchasers who would not recommend). The concerns with Tier 1 and Tier 2 APS most likely point to improper set up, but anecdotal evidence from open-ended survey responses also indicate some difficulties using Tier 2 APS with highly efficient devices.

Figure 10: Rational for Recommendation Likelihood - Online Tier 1 APS
(Multiple responses)

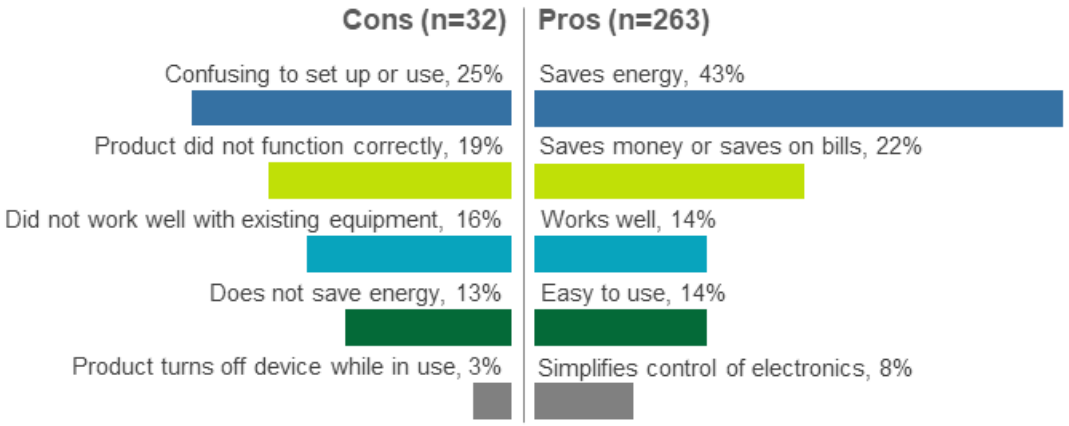
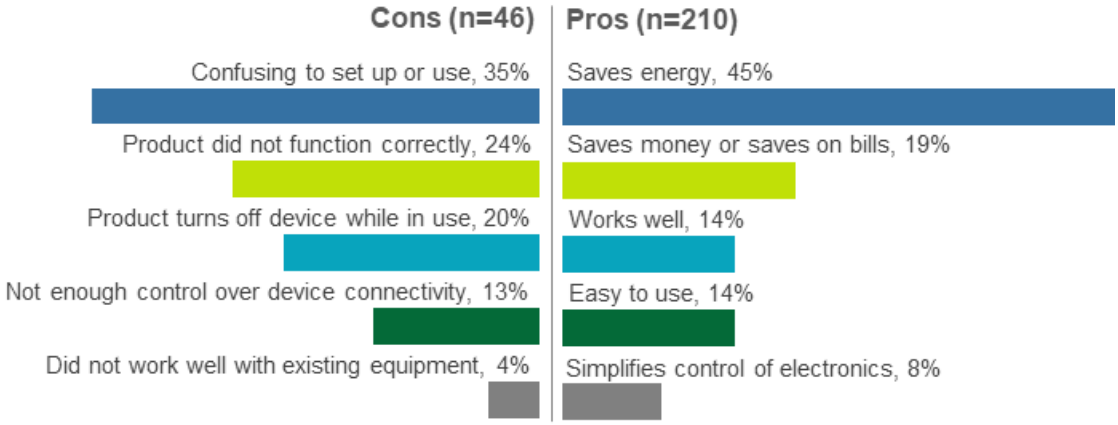


Figure 11: Rational for Recommendation Likelihood – Online Tier 2 APS
(Multiple responses)



In Figure 12, the right column lists the primary reasons leave behind Tier 1 APS respondents would be likely to recommend the APS to someone else. Saving energy was the most frequent answer (68%), followed by simplifying control of electronics (46%) and easy to set up (43%). The most frequently cited reasons why respondents would not recommend the APS are shown in the figure's left column. Most issues pertained to the set up and functionality of the APS: 42% said it was confusing to set up or use, 32% said it did not work well with existing equipment, and 16% had issues with the APS functioning properly.

Figure 12: Rational for Recommendation Likelihood – Leave Behind Tier 1 APS
(Multiple responses)

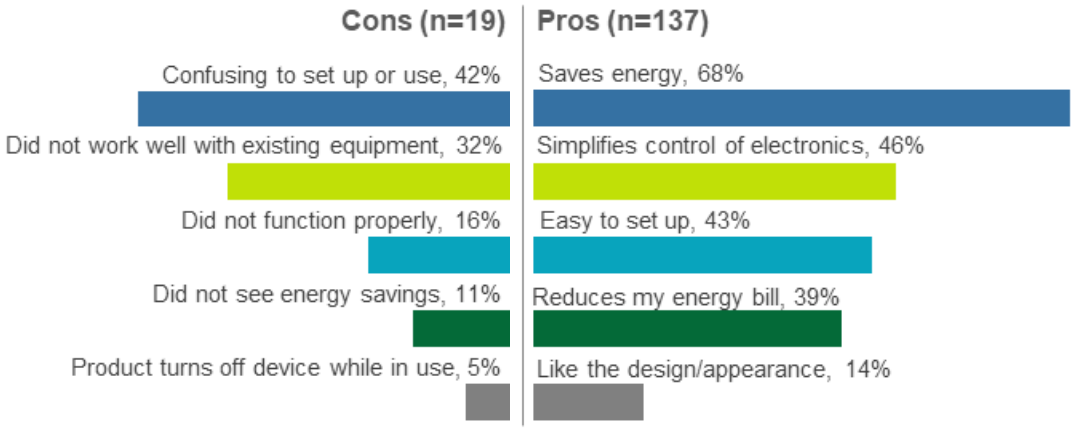


Figure 13 presents the top five reasons appliance respondents would likely recommend the product to someone else. Over one-half of the respondents (64%) said they would recommend the product because it works well. Other respondents said they would recommend the product because it saves energy (18%), is quiet (15%), and is affordable (10%). Only three respondents stated they would not recommend the room air cleaner; this was because it either did not function correctly or clean the air effectively.

Figure 13: Rational for Recommendation Likelihood - Appliance Product (n=341)
(Multiple responses)

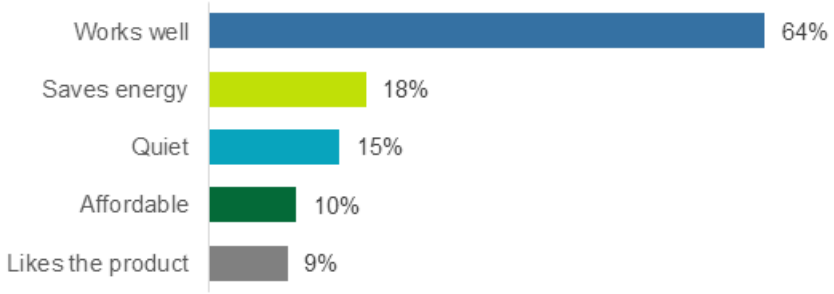
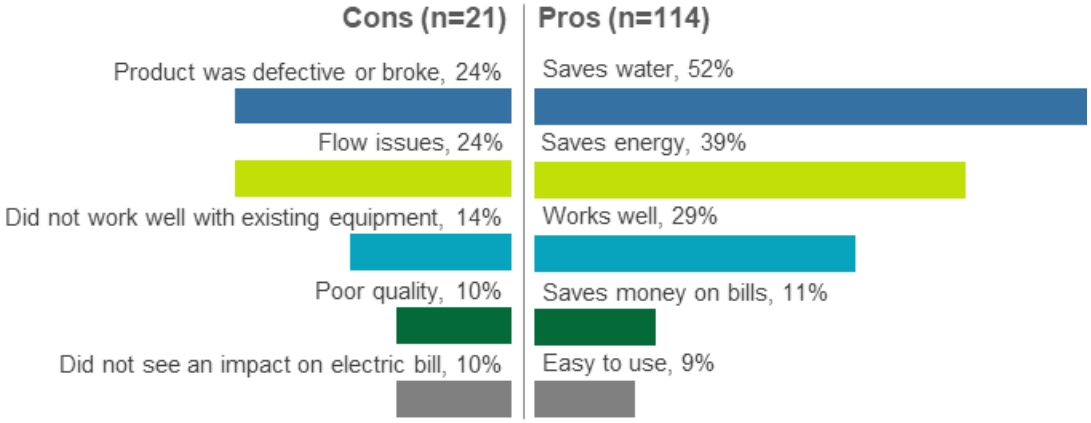


Figure 14 shows that over one-half of the showerhead respondents (52%) would recommend the products because they help save water, while 39% said they would recommend due to potential energy savings. Of the 21 respondents who provided reasons for not recommending the product, 48% said their showerhead products did not function correctly, broke, or had flow issues.

Figure 14: Rational for Recommending - Showerhead Product
(Multiple responses)



3.3 PRODUCTS PROGRAM IMPACT FACTORS BY KEY DEMOGRAPHICS

This section breaks out ISR and retention by home ownership and age for the products program respondents only.[17] While rates do not differ greatly, the analysis uncovered some interesting – and statistically significant – differences that may inform program planning and outreach. Renters (Table 8) and younger adults (Table 10) exhibit a higher installation rate than other respondents. The nature of APS and the devices they control – home entertainment and office systems – likely underlie this result. Respondents who obtained other products did not exhibit this same pattern (Table 9, Table 11). The team also looked at other demographics and found that ISR did not vary by education and income.

Table 8: Home Ownership ISR – Online APS

Ownership	n	ISR	Retention
Own	613	85%	95%
Rent	74	91%*	98%
Other	3	80%	100%
Don't Know	9	69%	100%

* Significantly different than owners at the 90% confidence level.

[17] Appendix B provides results for direct install program respondents. Given the smaller sample size by demographic group, the only statistically significant finding is that participants in two-to-four-unit buildings exhibit higher ISRs than those in single-family homes.

Table 9: Home Ownership ISR– Appliance Products

Ownership	n	ISR	Retention
Own	365	99%	98%
Rent	24	96%	98%
Don't Know	2	100%	100%

Table 10: Age ISR– Online APS

Respondent Age	n	ISR	Retention
Under 30	36	98%	93%
30-59	403	88%*	95%
60 and Above	221	79%*	97%
Prefer not to Answer	39	87%*	98%

* Significantly different than under 30 respondents at the 90% confidence level.

Table 11: Age ISR – Appliance Products

Respondent Age	n	ISR	Retention
Under 30	16	100%	100%
30-59	246	99%	98%
60 and Above	97	99%	98%
Prefer not to Answer	32	100%	100%

Appendix A Detailed Methods

This section provides detailed descriptions of the survey recruitment and the duration of short-term retention.

A.1 Survey Recruitment

For the surveys of product and direct install participants, the survey firm, RMS, sent out advance letters that included the following:

- a description of the survey and its purpose;
- a web identification number and link to the online survey; and
- a $5 incentive for completing the survey.

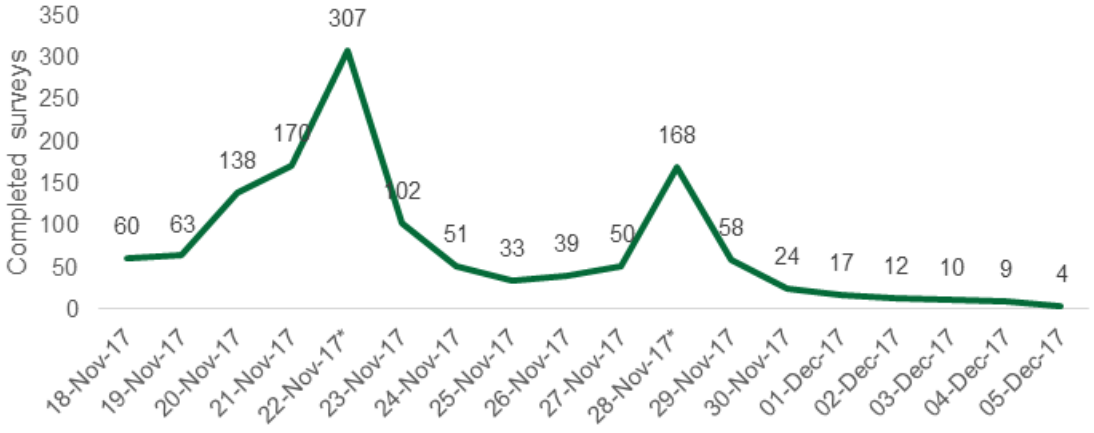
Two follow-up email reminders were sent out for each survey to participants with listed addresses to remind them to complete the survey. Table 12 provides the dates for the survey period, advanced letter mailing, and email reminders. A total of 1,268 respondents completed the products survey for an overall response rate of 43%. A total of 250 respondents completed the direct install survey for a response rate of 25%. The lower response rate for direct install participants may be influenced by the nature of the program, where the energy specialist left behind Tier 1 APS during an HEA, compared to the online APS participants who actively purchased the APS, likely increasing their engagement with their APS. In both surveys, nearly all respondents had valid email addresses. To compare with all program participants, 91% of direct install participants, 53% of mail-in rebate participants, and 100% of online purchasers had email addresses in the tracking database. This may suggest potential of non-response bias among mail-in rebate users, but because most adults now have email addresses (but declined to list them on a rebate form), we do not believe the bias has affected the results.

Table 12: Survey Recruitment Timeline

Survey	Survey Period	Advanced Letter Mailing	Email Reminder 1	Email Reminder 2	Overall Response Rate	Valid emails
Products Program	Nov. 15 - Dec. 5, 2017	Nov. 15, 2017	Nov. 22, 2017	Nov. 28, 2017	43%	98.5%
Direct Install Program	Jan. 5 - Jan. 28, 2018	Jan. 5, 2018	Jan. 11, 2018	Jan. 23, 2018	25%	97.6%

Figure 15 shows the daily completes for the products survey. Note the spikes in the completed survey count that corresponds to the dates when the email reminders were sent out, highlighting the effectiveness of email reminders on survey response rates.

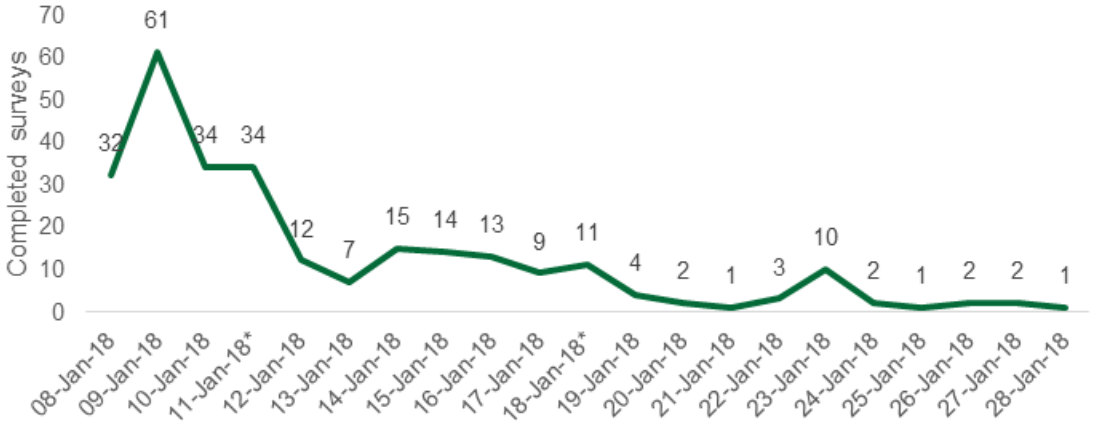
Figure 15: Products and Online APS Survey Daily Completes (n=2,950)



*Email reminder sent

Figure 16 shows the daily completes for the direct install survey. The impact of the email reminders was less pronounced for this survey compared to the products survey. This again suggests that the direct install participants were less engaged with the leave behind APS than those products participants who made the choice to buy APS.

Figure 16: Direct Install Survey Daily Completes (n=1,000)



*Email reminder sent

A.2 DURATION OF SHORT-TERM RETENTION

Short-term in the primary research is defined by the period between the purchased or received date and the date the respondent completed the survey. Table 13 breaks out the duration by product, which range from 5.6 to 32.1 months and an average of 14.5 months. The program tracking data EFI provided to NMR covers January 2016 to June 2017. The survey was fielded in October and November of 2017. Respondents who have had their devices more than 22 months likely purchased the measures prior to January 2016, but EFI processed the rebates and invoiced for them in 2016.

Table 13: Short-Term Duration by Product

Product	n	Average Duration (months)	Minimum (months)	Maximum (months)
Online APS	677	14.3	5.6	22.6
Dehumidifiers	124	15.4	6.0	30.5
Dryers	111	14.7	5.7	26.6
Room Air Cleaners	103	15.3	6.2	32.1
Showerheads	150	14	6.3	22.9
Total	**1,165**	**14.5**	**5.6**	**32.1**

Appendix B Detailed Survey Results

This appendix presents detailed survey results about the main sources of awareness, reasons for purchase, and reasons why products were uninstalled. When appropriate, we break out the results by product type and report responses of direct install program respondents separately from program respondents.

Table 14 lists where products program respondents primarily heard about the program offers; online or email advertisements were the most common sources of awareness. Other sources mentioned (not shown) include in-store and energy audits. Because they received Tier 1 APS through the HEA program, the survey did not probe direct install program respondents about their sources of awareness.

Table 14: Main Sources of Awareness[1]

How did you hear about the product or APS offer? (Multiple Response)	Appliance Products (n=391)	Showerhead Products (n=178)	APS (n=699)
Online or Email Advertisement	34%	54%	49%
Utility Bill Insert	14%	15%	15%
Via Social Media	2%	12%	19%
From Family or Friends	10%	5%	6%
Print Advertisement	14%	3%	3%
From a Community Action Agency or Organization	4%	3%	3%
Pop-up Retail Event	6%	<1%	1%
Radio Advertisement	1%	0%	<1%
School Program	0%	<1%	<1%
Other	21%	5%	8%
Don't Know / Refused	7%	8%	7%

[1] Multiple responses allowed.

NMR asked respondents to indicate the primary reasons for their purchase, shown in Table 15. One-half of appliance product respondents said they wanted to replace old or failing equipment, while one-fourth said they wanted to save on energy bills. Showerhead product respondents said they made their purchase to save on energy bills (85%) and/or to reduce their carbon footprint (31%). Three-fourths of APS respondents said their primary reason for purchase was to save on energy bills, and almost one-half said they wanted to protect their electronic equipment.

Table 15: Reasons for Purchase[1]

Why did you purchase this product or APS? (Multiple Response)	Appliance Products (n=391)	Showerhead Products (n=178)	APS (n=699)
To save on energy bills	25%	85%	75%
To replace older and/or malfunctioning equipment	50%	22%	25%
Recommended by utility company or Mass Save	10%	26%	36%
To reduce carbon footprint	10%	31%	30%
To protect my electronic equipment	--	--	48%
To create more outlets for use	--	--	22%
I only have to turn on one device	--	--	18%
Recommended by family or friend	10%	2%	2%
Other	24%	11%	1%
Don't know	<1%	0%	0%

[1] Multiple responses allowed.

Table 16 lists the primary reasons why a product or APS was uninstalled. Respondents who removed the products typically cited not liking them or poor products performance (for all APS and showerheads), not meeting one's needs (leave behind APS) and poor performance (for all APS and showerheads). Very few products had been removed from service, and the reasons cited varied.

Table 16: Reason for Product or APS Removal

What were the main reasons the product or APS was removed? (Multiple Response)	Leave Behind APS (n=22)	APS (n=63)	Showerhead Products (n=23)	Appliance Products (n=8)
Did not like the product	36%	51%	39%	--
Does not work for my needs	33%	--	--	--
Product did not function properly	18%	44%	35%	2
No longer needed	18%	--	--	--
Relocation or renovation	9%	5%	--	2
Problems with leaks / flow	--	--	17%	--
Did not work w/equipment	--	6%	4%	--
Confusing to set up	--	6%	--	--
Other	5%	8%	4%	3
Don't know	5%	17%	--	2

[1] Multiple responses allowed.

B.1 ADDITIONAL IMPACT FACTORS BY KEY DEMOGRAPHICS

The main body of the report summarized key findings on product program respondent demographics by impact factors (Section 3.3). The following three tables report demographic breakdowns for the direct install respondents. None of the comparisons are statistically different.

Table 17: Home Type ISR – Online APS

Type of Home	n	ISR	Retention
Single-family	516	85%	95%
Duplex, Triple Decker, Apartment/Condo (2-Units), Townhouse, or Row House	124	87%	99%
Apartment/Condo (5+ Units)	28	93%	97%
Other	8	100%	92%
Don't Know	3	50%	100%

Table 18: Home Type ISR – Appliance Products

Type of Home	n	ISR	Retention
Single-family	310	100%	99%
Duplex, Triple Decker, Apartment/Condo (2-Units), Townhouse, or Row House	56	98%	97%
Apartment/Condo (5+ Units)	22	95%	100%
Other	1	100%	100%
Don't Know	2	100%	100%

Table 19: Home Type Specific ISR– Leave Behind APS

Type of Home	n	ISR	Retention
Single-family	215	80%	94%
Duplex, Triple Decker, Apartment/Condo (2-Units), Townhouse, or Row House	29	93%	93%
Other	5	100%	88%
Don't Know	1	50%	100%

* Significantly different than single-family at the 90%.

Table 20: Tenure Status Specific ISR – Leave Behind APS

Residence Status	n	ISR	Retention
Own	242	81%	94%
Rent	7	91%	90%
Don't Know	1	50%	50%

Table 21: Age Specific ISR – Leave Behind APS

Type of Home	n	ISR	Retention
Under 30	14	78%	86%
30-50	135	84%	96%
60 and Above	78	77%	96%
Prefer not to Answer	24	76%	81%

Appendix C Literature Review Sources

The following subsections include a list of sources used to support the literature review for products and APS In-Service Rate values.

C.1 Product Sources

Cadmus, Nexant. Ameren Missouri Efficient Products Impact and Process Evaluation: Program Year 2014. May 2015. https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935933387

NMR, Nexant. Efficiency Maine Appliance Rebate Program Evaluation Overall Report. July 2014. http://www.efficiencymaine.com/docs/Efficiency-Maine-Appliance-Rebate-Program-Evaluation-Report-2014.pdf

DNV GL. Impact Evaluation of 2013-2014 SDG&E Residential VSD Pool Pump Program. Prepared for California Public Utilities Commission. April 2016. http://www.calmac.org/publications/Res6_2013-2014_SDGE_VSD_Pool_Pump_Program_Evaluation_FINAL_REPORT_to_CALMAC.pdf

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Appendix D Survey Instruments

This section provides the web survey questions for the Products and Advanced Power Strip Survey and Advanced Power Strip Direct Install Survey.

D.1 Products (Task 175) and Advanced Power Strip (task 174b) Survey Instrument

###CODING NOTES###

- ***PA = Program Administrator***
- ***P# = Number of products purchased {read from file}***
- ***Product = Product type {read from file}***
- ***Brand = Brand of advance power strip(s) purchased {read from file}***
- ***Randomize = Randomize response categories***
- ***Allow respondents to advance without answering and code as did not answer***
- ***Rebate/Discount = 'Discount' for showerheads and showerhead adaptors, 'Rebate' for all other measures***

Introduction

*Thank you for taking the time to complete this survey. This survey asks questions about your recent **["PRODUCT" OR "BRAND advanced power strip"]** purchase. Please have the person who made the decision to purchase [this/these] products complete the survey. Answer the questions to the best of your ability. All your responses will remain confidential. The survey should take about 15 minutes to complete.*

Confirmation

C1. ***{FOR PRODUCTS}*** Can you confirm that your household received a **[REBATE/DISCOUNT]** for one or more **[PRODUCT(S)]** through Mass Save or **[INSERT PA]**?

{FOR APS} Can you confirm that your household purchased one or more advanced power strips through the Mass Save® or **[INSERT PA]**?

1. Yes
2. No **[TERMINATE]**
3. **[APS ONLY]** Purchased but have not received **[TERMINATE]**

98. Don't know **[CONTINUE]**

[SHOW PICTURE OF PRODUCT OR APS THEY PURCHASED WHILE ANSWERING C1] [DISPLAY TEXT UNDER PICTURE: *Example [PRODUCT OR APS]. Your model may look slightly different.]*

Temperature Sensitive Showerhead	
Temperature Sensitive Showerhead Adaptor	
Dryer	
Dehumidifier	

Room Air Cleaners	
Tier 1 APS	
Tier 2 APS IR+OS	
Tier 2 APS IR	

C2. Just to confirm, are you the person who purchased or made the decision to purchase this equipment?

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

C3. **[IF C2 = 2 or 98]** Is the person who purchased or made the decision to purchase this equipment available to take this survey?

1. Yes **[IF YES:** Great. Please have the person who purchased or made the decision to purchase this equipment complete the survey**.]**
2. No **[TERMINATE]**
98. Don't know **[TERMINATE]**

C4. ***{FOR PRODUCTS}*** According to our records, you received a **[REBATE/DISCOUNT]** for **[READ IN P#] [PRODUCT(S)]** through Mass Save or **[INSERT PA].** Can you confirm that you purchased **[READ IN P#] [PRODUCT(S)]**?

{FOR APS} According to our records, you purchased **[READ IN P#] [READ IN BRAND]** advanced power strip(s) through the Mass Save® or **[INSERT PA]'s** website. Can you confirm that you purchased **[READ IN P#]** advanced power strips?

1. Yes **[GO TO A1]**
2. No
98. Don't know

C5. **[IF C4 = 2 or 98]**

{FOR PRODUCTS} How many **[PRODUCT(S)]** do you recall receiving a **[REBATE/DISCOUNT]** for through Mass Save or **[INSERT PA]**?

{FOR APS} How many advanced power strips do you recall purchasing through the Mass Save or **[INSERT PA]'s** website?

[RECORD #, 1-10] [ALLOW DON'T KNOW]

###FOR REMAINDER OF SURVEY, RECODE P# TO RESPONSE FROM C5###

C6. **[IF C5 = DON'T KNOW]** That's ok. For the rest of this survey we'll just assume you purchased one **["PRODUCT" OR "advance power strip"]**. Ok?

1. Yes - continue
2. No **[TERMINATE]**

###IF C6 = 1; FOR REMAINDER OF SURVEY, RECODE P# TO 1###

SOURCES OF AWARENESS

A1. ***{FOR PRODUCTS}*** How did you first hear about the **[PRODUCT] [REBATE/DISCOUNT]**?

{FOR APS} How did you first hear about the advanced power strips offered through the Mass Save or **[INSERT PA]** website?

Select all that apply… **[RANDOMIZE]**

1. Online or email advertisement
2. Radio advertisement
3. Print advertisement
4. Pop-up retail event
5. Utility bill insert
6. From family or friends
7. From a community action agency or organization
8. Via social media (Facebook, LinkedIn, Twitter, Instagram)
9. School program

55. (Other, [SPECIFY])
98. (Don't know)
99. Prefer not to answer

A2. **[IF P# = 1]** Why did you purchase this **[PRODUCT OR "advanced power strip"]**?

[IF P# > 1] Why did you purchase these **[PRODUCTS OR "advanced power strips"]**?

Select all that apply… **[RANDOMIZE]**

1. To save on energy bills
2. To reduce carbon footprint
3. To replace older and / or malfunctioning equipment
4. **[APS ONLY]** To protect my electronic equipment
5. **[APS ONLY]** To create more outlets for use
6. **[APS ONLY]** So I only have to turn on one device
7. Recommended by family or friend
8. Recommended by utility company or Mass Save

55. (Other, [SPECIFY])
98. (Don't know)

ISR / PERSISTENCE

{FOR PRODUCTS} Now we'd like to ask a few questions about how you are using the **[PRODUCT(S)]** for which you received a **[REBATE/DISCOUNT]**.

{FOR APS} Now we'd like to ask a few questions about how you are using the advanced power strip(s) you purchased at a reduced cost.

I1. **[IF P# = 1 AND PRODUCT = SHOWERHEAD, SHOWERHEAD ADAPTOR, OR DRYER]** Is the **[PRODUCT]** for which you received a Mass Save **[REBATE/DISCOUNT]** currently installed?

[IF P# = 1 AND PRODUCT = DEHUMIDIFIER OR ROOM AIR PURIFIER] Do you use the **[PRODUCT]** for which you received a Mass Save **[REBATE/DISCOUNT]**?

[IF P# = 1 AND APS] Is the advanced power strip you purchased through Mass Save currently plugged in with devices connected to it?

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

I2. **[IF I1 = 2 or 98]**

{FOR PRODUCTS} Did you install the **[PRODUCT]** and later remove it?

{FOR APS} Did you plug the advanced power strip in with devices connected to it and later remove it?

1. Yes
2. No **[GO TO DEMOGRAPHICS]**
98. Don't know **[GO TO DEMOGRAPHICS]**

I3. ***{FOR PRODUCTS}*** **[IF P# > 1]** How many of the [P#] **[PRODUCTS]** for which you received a Mass Save **[REBATE/DISCOUNT]** are currently installed and in use?

{FOR APS} **[IF P# > 1]** How many of the [P#] advanced power strips you purchased through Mass Save are currently plugged in with devices connected to it?

[RECORD #] [MUST BE ≤ P#]

I4. **[If I3< P# AND P#-I3=1]** For the **[PRODUCT OR "advanced power strip"]** currently not installed, had you installed it and later removed it?

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

[IF I3 < P# AND P#-I3 >1] How many of the **[P# - I3] [PRODUCT(s) OR "advanced power strip(s)"]** that are currently not installed had been installed and were later removed?

[RECORD #] [MUST BE ≤ P# - I3]

I5. **[IF I2 = 1 OR I4 = 1]** What are the main reasons the **[PRODUCT OR "advanced power strip"]** was removed? Select all that apply…

[IF I4 > 1] What are the main reasons the **[PRODUCTS OR "advanced power strips"]** were removed? Select all that apply…

[RANDOMIZE]

1. Did not like the product
2. Product did not function correctly
3. (Other, [SPECIFY])

98. Don't know

I6. **[IF I2 = 1 or I4 =1]** Do you have plans to install the **[PRODUCT OR "advanced power strip"]** in the future?

[IF I4 > 1] Do you have plans to install these **[PRODUCTS OR "advanced power strips"]** in the future?

1. Yes
2. No

98. (Don't know)
99. Prefer not to answer

I7. **[IF I6 = 2]** Why do you not have plans to install **[PRODUCT OR "advanced power strip"]**?

[RANDOMIZE]

1. No longer needed
2. Does not work for my needs
3. Not what I was expecting
4. I'm too busy
5. Product does not function properly

98. (Don't know)
99. Prefer not to answer

###IF I1=YES OR I2=YES OR I3>0 or I4>0; CONTINUE; OTHERWISE GO TO DEMOGRAPHICS###

SATISFACTION

S1. **[APS ONLY]** Thinking just about the advanced power strip(s) that is (are) currently installed, how would you rate the ease of installation/setup? Use a scale of 0 to 10 where 0 is extremely difficult and 10 is extremely easy.

[RECORD # 0-10; 98 = DK]

S2. Thinking just about the **[PRODUCT(S) or "advanced power strip(s)']** that is (are) currently or previously in use, how satisfied are you with the performance?

1. Not at all satisfied
2. Somewhat unsatisfied
3. Neither satisfied nor unsatisfied
4. Somewhat satisfied
5. Very satisfied

98. (Don't know)

S3. Based on your experience so far, how likely are you to recommend **["this product" OR "an advanced power strip"]** to someone else? Use a scale of 0 to 10 where 0 is extremely unlikely and 10 is extremely likely.

(If you have already recommended **["this product" OR "an advanced power strip"]** to someone else, please type the number 10)

[RECORD # 0-10; 98 = DK]

S4. **[IF S3 <5]** Why would you be unlikely to recommend **["this product" OR "an advanced power strip"]** to someone else?

[OPEN END RESPONSE]

S5. **[IF S3 >5]** Why would you be likely to recommend **["this product" OR "an advanced power strip"]** to someone else?

[OPEN END RESPONSE]

FREE-RIDERSHIP

{FOR PRODUCTS} For the following questions, please base your answers on your experiences with all **[PRODUCT(S)]** for which you received a **[REBATE/DISCOUNT]**.

{FOR APS} For the following questions, please base your answers on your experiences with all advanced power strips that you purchased.

FR1. Please consider how influential the following elements were on your decision to purchase a(n) **[PRODUCT OR "advanced power strip"]**. Please base your answer on a scale of 0 to 10, with 0 indicating "no influence" and 10 indicating "great influence."

[RANDOMIZE A-F] [CODE A-F SO THEY APPEAR ON ONE SCREEN IF POSSIBLE—MAY NOT WORK ON PHONES]

a. The rebate or discount on the price of the **[PRODUCT OR "advanced power strip"]**
b. The Mass Save website
c. Information from **[INSERT PA]**
d. **[IF A1 = (1 through 9)]** Information provided by **[Fill-in answer(s) from A1]**
e. Recommendation from friends or colleagues
f. Internet research that I or someone in my household conducted

[OPEN END NUMERIC 0-10] [DK = 98]

FR2. Before learning about the **[REBATE/DISCOUNT OR "advanced power strips"]** offered through Mass Save, did you plan to purchase and install a(ny) **[PRODUCT(S) OR "power strip(s)]** of the same level of efficiency?

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

If you had not purchased one or more **["PRODUCT(S) and received a REBATE/DISCOUNT" OR "advanced power strips at a reduced cost"]** through the program, what is the likelihood you would have done each of the following. Please base your answer on a scale of 0 to 10, with 0 indicating "not at all likely" and 10 indicating "extremely likely."

FR3. purchased any **[PRODUCT OR "power strip"]** within the next **[IF SHOWERHEAD OR APS – "six months"] [Otherwise: "twelve months"]**?

[OPEN END NUMERIC 0-10] [DK = 98]

FR4. purchased the exact same **[PRODUCT OR "advanced power strip"]?**

[OPEN END NUMERIC 0-10] [DK = 98]

FR5. **[IF P# > 1]** purchased fewer **[PRODUCTs OR "advanced power strips"]?**

[OPEN END NUMERIC 0-10] [DK = 98]

FR6. **[ASK IF (FR1a > 7 AND FR3 > 7) OR (FR1a < 3 AND FR3 < 3))] [IF FR1a OR FR3 = 98, SKIP TO NEXT MODULE]** Some of your answers (shown below) suggest that the **[REBATE/DISCOUNT]** was important in your decision to purchase the **[PRODUCT OR "advanced power strip"]**, but others suggest that the **[REBATE/DISCOUNT]** was not very important. Do you want to change your responses to one or both questions? Enter your final answers below.

		Your response	Revised response **[ALLOW 0 TO 10 RESPONSES]**
a	Please consider how influential rebate or discount on the price on your decision to purchase a(n) **[PRODUCT OR "advanced power strip"]**. Please base your answer on a scale of 0 to 10, with 0 indicating "no influence" and 10 indicating "great influence."	**[FR1a]**	
b	If you had not purchased one or more **["PRODUCT(S) and received a REBATE/DISCOUNT" OR "advanced power strips at a reduced cost"]** through the program, what is the likelihood you would have purchased any? Please base your answer on a scale of 0 to 10, with 0 indicating "not at all likely" and 10 indicating "extremely likely."	**[FR3]**	

[SKIP TO NEXT MODULE IF (FR6a > 7 AND FR6b < 3) OR (FR6a < 3 AND FR6b > 7))]

FR9. **[READ IF FR6a < 3 AND FR6b < 3]** You say that you would have been unlikely to purchase a(n) **[PRODUCT OR "advanced power strip"]** if the rebate or discount wasn't available, but at the same time you say that the rebate or discount was not influential in your decision to purchase it.

[READ IF FR6a > 7 AND FR6b > 7] You say that you would have been likely to purchase a(n) **[PRODUCT OR "advanced power strip"]** if the rebate or discount wasn't available, but at the same time you say that the rebate or discount was influential in your decision to purchase it.

[READ FOR ALL] Could you explain how the rebate or discount played into your decision? **[OPEN END]**

SPILLOVER

SO1. Since purchasing the **["PRODUCT(S)] and receiving a [REBATE/DISCOUNT" OR "advanced power strip at a reduced cost"]** have you purchased and installed any other energy efficient products?

1. Yes
2. No **[GO TO D1]**
98. (Don't know) **[GO TO D1]**

SO2. Did your participation in the Mass Save program influence you in any way to make these purchases?

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

SO3. Did you receive a rebate, discount, or other incentive from Mass Save on any of these purchases?

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

SO4. Thinking only about the energy efficient products you purchased that were NOT part of the Mass Save program, what other energy efficient product(s) did you purchase? Select all that apply. **[MULTIPLE RESPONSE]**

1. Clothes Washer - Energy Efficient Model
2. Clothes Dryer - Energy Efficient Model
3. Room Air Conditioner - Energy Efficient Model
4. Room Air Cleaner - Energy Efficient Model
5. Dehumidifier - Energy Efficient Model
6. Refrigerator - Energy Efficient Model
7. Freezer - Energy Efficient Model
8. LED Bulb
9. LED Fixture
10. Low Flow Shower Fixture
11. Advanced Power Strip
12. Smart or Learning Thermostat (Nest, GoControl, Ecobee, Hive, etc.)
13. I did not purchase any energy efficient products outside of the Mass Save program **[GO TO D1]**

55. (Other, [SPECIFY])
98. (Don't know) **[GO TO D1]**

SO5. **[IF COUNT OF SO4 = 1]** How did you know this product was energy efficient? Select all that apply.

[IF COUNT OF SO4 > 1] How did you know these products were energy efficient? Select all that apply.

[MULTIPLE RESPONSE]

1. EnergyStar® label
2. EnergyGuide label
3. Sales person in store
4. In store signage
5. Product manual
6. Researched product beforehand
7. Mass Save Website
8. Advertisement

55. (Other, [SPECIFY])
98. (Don't know)

SO6. How important was your participation in the Mass Save program on your decision to make additional energy efficiency improvements on your own? **[Scale from 0-10 where 0 is "not at all important" and 10 is "extremely important"]**

SO7. **[IF SO5 <> 1]** If you had not participated in the Mass Save program, how likely is it that you would have implemented this additional energy efficiency measure? **[Scale from 0-10 where 0 is "not at all likely" and 10 is "extremely likely"]**

DEMOGRAPHICS

Please keep your primary address in mind while answering the remaining survey questions.

D1. What type of home do you live in? Please select one.

1. Single family
2. Duplex
3. Triple decker (e.g., three=story house with each floor being a separate unit)
4. Apartment/condo in a 2-4-unit building
5. Apartment/condo in a 5+ unit building
6. Townhouse or row house (adjacent walls to another house)
7. Mobile home or trailer
55. (Other, [SPECIFY])
98. (Don't know)

D2. Do you own or rent this residence?

1. Own
2. Rent
55. (Other, [SPECIFY])
98. (Don't know)

D3. Is the home that we have been discussing, located at [INSERT_ADDRESS], a primary residence?

1. Yes, it is a primary residence
2. No, it is a secondary residence or vacation home
55. Other (Please specify)

D4. Counting yourself, how many individuals typically occupy this home? Enter zero if not occupied for at least six months.

Occupant Type	Number
Adults, 18 and older	[RECORD NUMBER]
Children, under 18	[RECORD NUMBER]

D5. What is the highest level of education that you have completed so far?

1. Less than ninth grade
2. Ninth to twelfth grade, no diploma
3. High school graduate (includes GED)
4. Some college, no degree
5. Associates degree
6. Bachelor's degree
7. Graduate or professional degree
99. Prefer not to answer

D6. Which of the following best describes your age?

1. 18-24
2. 25-29
3. 30-39
4. 40-49
5. 50-59
6. 60-69
7. 70-79
8. 80-89
9. 90 years or older
99. Prefer not to answer

D7_1 **[IF D4=1]** Which of these categories best describes your expected total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $34,001, OR	**[GO TO D8]**
02	$34,001 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_2 **[IF D4=2]** Which of these categories best describes your expected total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $44,463, OR	**[GO TO D8]**
02	$44,463 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_3 **[IF D4=3]** Which of these categories best describes your expected total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $54,925, OR	**[GO TO D8]**
02	$54,925 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_4 **[IF D4=4]** Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $65,387 OR	**[GO TO D8]**
02	$65,387 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_5 **[IF D4=5]** Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $75,849, OR	**[GO TO D8]**
02	$75,849 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_6 **[IF D4=6]** Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

01	Less than $86,311 OR	**[GO TO D8]**
02	$86,311 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_7 **[IF D4=7]** Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

01	Less than $88,272, OR	**[GO TO D8]**
02	$88,272 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_8 **[IF D4=8]** Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

01	Less than $90,234, OR	**[GO TO D8]**
02	$90,234 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D8 **[EVERYONE]** Which category best describes your total household income in 2016 before taxes?

01 Less than $10,000
02 $10,000 to $14,999
03 $15,000 to $24,999
04 $25,000 to $34,999
05 $35,000 to $49,999
06 $50,000 to $74,999
07 $75,000 to $99,999
08 $100,000 to $149,999
09 $150,000 to $199,999
10 $200,000 or more
99 Prefer not to answer

D9 Which of the following best describes how your electric bill is paid:

01 I pay my electric bill
02 Someone else pays my electric bill
03 **[IF D2 = 2]** My bill is included in my rent
04 Other [SPECIFY]
88 Don't know
99 Prefer not to answer

CLOSING

Thank you for your participation in this survey.

D.2 ADVANCED POWER STRIP (TASK 174X) DIRECT INSTALL SURVEY INSTRUMENT

###CODING NOTES###

- ***PA = Program Administrator***
- ***P# = Number of products purchased {read from file}***
- ***Randomize = Randomize response categories***
- ***Allow respondents to advance without answering and code as did not answer***

INTRODUCTION

Thank you for taking the time to complete this survey. This survey asks questions about power strips that you may have received from an Energy Specialist during a recent Home Energy Assessment conducted through the Mass Save® *Program. Please have the person most knowledgeable about the Mass Save Home Energy Assessment complete the survey. Answer*

the questions to the best of your ability. All your responses will remain confidential. The survey should take about 15 minutes to complete.

CONFIRMATION

C1. Just to confirm, are you the person most knowledgeable about the recent Mass Save® Home Energy Assessment, also known as an energy audit?

3. Yes
4. No
99. Don't know

C2. **[IF C1 = 2 or 98]** Is the person who is most knowledgeable about the Mass Save® Home Energy Assessment available to take this survey?

3. Yes **[IF YES:** Great. Please have the person who is most knowledgeable about the Mass Save Home Energy Assessment complete the survey**.]**
4. No **[TERMINATE]**
99. Don't know **[TERMINATE]**

C3. **Did** your household receive one or more advanced power strips through the assessment?

4. Yes [**GO TO C4]**
5. No **[GO TO C3a]**
99. Don't know **[GO TO C3a]**

C3a**. [PROBE IF C3=2 or 98]** The Energy Specialist left the advanced power strip(s) with you but did not install [it/them]. Do you now recall receiving one or more advanced power strips during the assessment?

1. Yes **[CONTINUE]**
2. No **[TERMINATE]**
3. Don't know **[TERMINATE]**

[SHOW PICTURES OF APS; DISPLAY TEXT UNDER PICTURE: *Example Advanced Power Strip. Your model may look slightly different.]*

C4. According to our records, your Energy Specialist left behind **[READ IN P#]** advanced power strip(s) through the assessment. Can you confirm that you received **[READ IN P#]** advanced power strips?

1. Yes **[GO TO I1]**
2. No **[GO TO C5]**

99. Don't know **[GO TO C5]**

C5. **[IF C4 = 2 or 98]**

How many advanced power strips do you recall the Energy Specialist leaving with you?

[RECORD #, 1-10] [IF DON'T KNOW GO TO C6]

###IF C5 ≠ DON'T KNOW, FOR REMAINDER OF SURVEY, RECODE P# TO RESPONSE FROM C5###

C6. **[IF C5 = DON'T KNOW]** That's ok. For the rest of this survey we'll just assume you received one advanced power strip. Ok?

3. Yes - continue
4. No **[TERMINATE]**

###IF C6 = 1; FOR REMAINDER OF SURVEY, RECODE P# TO 1###

ISR / PERSISTENCE

Now we'd like to ask a few questions about how you are using the advanced power strip(s) you received during the assessment from the Energy Specialist.

I1. **[IF P# = 1]** Is the advanced power strip you received during the assessment currently plugged in with devices connected to it?

3. Yes **[GO TO APS USE]**
4. No
99. Don't know

I2. **[IF I1 = 2 or 98]**

Did you plug the advanced power strip in with devices connected to it and later remove it?

3. Yes
4. No
99. Don't know **[GO TO DEMOGRAPHICS]**

I3. **[IF P# > 1]** How many of the [P#] advanced power strips you received during the assessment are currently plugged in with devices connected to it?

[RECORD #] [MUST BE ≤ P#]

[IF I3 = DON'T KNOW, GO TO DEMOGRAPHICS]

I4. **[If I3< P# AND P#-I3=1]** For the advanced power strip currently not installed, had you installed it and later removed it?

1. Yes **[GO TO I5]**
2. No **[GO TO I6]**
98. Don't know **[GO TO GO TO I6]**

[RECORD # = 1]

[IF I3 = 0 OR IF I3 < P# AND P#-I3 >1] How many of the **[P# - I3]** advanced power strips that are currently not installed had been installed and were later removed?

[RECORD #] [MUST BE ≤ P# - I3]

[IF I3 = 0 AND I4 = 0 GO TO I8]

I5. **[IF I2 = 1 OR I4 = 1]** What are the main reasons the advanced power strip was removed? Select all that apply…

[IF I4 > 1] What are the main reasons the advanced power strips were removed? Select all that apply…

[RANDOMIZE]

4. Did not like the product
5. Product did not function correctly
- (Other, [SPECIFY])

99. Don't know

I6. **[IF I2 = 1 or I3< P# AND P#-I3=1]** Do you have plans to install the advanced power strip in the future?

[IF I3 < P# AND P#-I3 >1] Do you have plans to install these advanced power strips in the future?

3. Yes
4. No

100. (Don't know)
101. Prefer not to answer

I7. **[IF** I4_1=(2 or 3) **AND I6 = 2]** Why do you not have plans to install the **advanced power strip**?

IF I6 = 2] Why do you not have plans to install these **advanced power strips**?

[RANDOMIZE]

6. No longer needed
7. Does not work for my needs
8. I'm too busy
9. It's too complicated to set up
10. Product does not function properly
11. Or something else [SPECIFY]

100. (Don't know)
101. Prefer not to answer

I8. **[IF I2 = 2]** Do you have plans to install the advanced power strip in the future?

[IF I3 = 0 AND I4 _1=2 OR I4_2= 0] Do you have plans to install these advanced power strips in the future?

1. Yes
2. No

98. (Don't know)
99. (Refused)

I9. **[IF I2 = 2 and I8 = 2]** Why do you not have plans to install the **advanced power strip**?

IF I3 = 0 AND I4 = 0 AND I8 = 2] Why do you not have plans to install these **advanced power strips**?

[RANDOMIZE]

1. No longer needed
2. Does not work for my needs
3. I'm too busy
4. It's too complicated to set up
5. Or something else [SPECIFY]

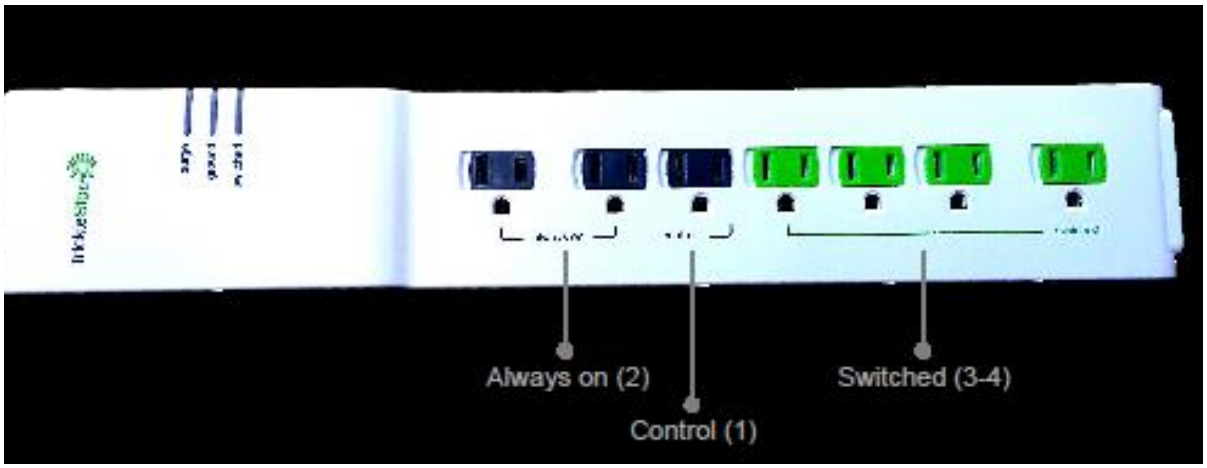
98. (Don't know)
99. (Refused)

IF I1=YES OR I3>0, GO TO APS USE;

IF I2=YES OR I4_1=1 or I4_2>0 GO TO SATISFACTION; OTHERWISE GO TO FREERIDERSHIP###

APS USE

We'd like to understand what devices you have connected to your advanced power strips(s) received during the assessment. The enlarged picture below shows an example of an advanced power strip. While your power strip may look different, most have 6 or 7 total outlets. In this picture, outlets 1 and 2 are always on, outlet 3 is the control and outlets 4 through 7 are switched outlets.



U1. **[IF I1=YES OR I3=1]** For each outlet, please indicate which device is plugged into:

[IF I3 > 1] For the power strip that is closest to you at this moment, please indicate which device is plugged into:

###CREATE DROP DOWN LIST FOR EACH SLOT FROM TABLE###

1. Always-on [DROP DOWN LIST]
2. Always-on [DROP DOWN LIST]

3. Control Outlet [DROP DOWN LIST]
4. Switched [DROP DOWN LIST]
5. Switched [DROP DOWN LIST]
6. Switched [DROP DOWN LIST]
7. Switched [DROP DOWN LIST]

Television	Computer
Set Top Box (Cable/Satellite)	Monitor
DVD or Blu-ray Player	Printer
Streaming media device (Apple TV, Chromecast, Roku, etc.)	Computer speakers
Gaming system (Xbox, PlayStation, Wii, etc.)	External Hard Drive
Surround Sound System/Speaker	Modem
Nothing/Empty	Other [SPECIFY]
Don't know	My advanced power strip does not have this outlet

SATISFACTION

S1. Thinking just about the advanced power strip(s) that is (are) **currently** or **previously** installed, how would you rate the ease of installation/setup? Use a scale of 0 to 10 where 0 is extremely difficult and 10 is extremely easy.

[RECORD # 0-10; 98 = DK]

S2. Thinking just about the advanced power strip(s) that is (are) **currently** or **previously** in use, how satisfied are you with the performance?

6. Not at all satisfied
7. Somewhat unsatisfied
8. Neither satisfied nor unsatisfied
9. Somewhat satisfied
10. Very satisfied
99. (Don't know)

S3. Based on your experience so far, how likely are you to recommend an advanced power strip to someone else? Use a scale of 0 to 10 where 0 is extremely unlikely and 10 is extremely likely.

(If you have already recommended an advanced power strip to someone else, please type the number 10)

[RECORD # 0-10; 98 = DK]

S4. **[IF S3 <3]** Why would you be unlikely to recommend **an advanced power strip** to someone else?

[RANDOMIZE; ALLOW MULTIPLE RESPONSE]

1. Did not function properly
2. Was confusing to set up
3. Did not work well with my existing equipment
4. Did not see any energy savings
5. Other [SPECIFY}

98. (Don't know)

S5. **[IF S3 >7 (but not 98)]** Why would you be likely to recommend **an advanced power strip** to someone else?

[RANDOMIZE; ALLOW MULTIPLE RESPONSE]

1. Saves energy
2. Reduces my energy bill
3. Simplifies the control of my electronics
4. Like the design/appearance
5. Easy to set up
6. Other [SPECIFY}

98. (Don't know)

FREE-RIDERSHIP

For the following questions, please base your answers on your experiences with all advanced power strips that you purchased.

FR1 Before the assessment, had you ever heard of advanced power strips?

1. Yes
2. No **[GO TO INTRO TO FR3]**

98. (Don't know) **[GO TO INTRO TO FR3]**

FR2. Before receiving the advanced power strips from the Energy Specialist during the assessment, did you plan to purchase and install a comparable advanced power strip(s)?

3. Yes
4. No

99. (Don't know)

[INTRO TO FR3 TO FR5] If you had not received an advanced power strip(s) during the assessment, what is the likelihood you would have done each of the following. Please

base your answer on a scale of 0 to 10, with 0 indicating “not at all likely" and 10 indicating “extremely likely.”

FR3. purchased any power strip within the next six months?

[OPEN END NUMERIC 0-10] [DK = 98]

FR4. purchased the exact same advanced power strip?

[OPEN END NUMERIC 0-10] [DK = 98]

FR5. **[IF P# > 1]** purchased fewer advanced power strip(s)?

[OPEN END NUMERIC 0-10] [DK = 98]

DEMOGRAPHICS

Please keep your primary address in mind while answering the remaining survey questions.

D1. What type of home do you live in? Please select one.

8. Single family
9. Duplex
10. Triple decker (e.g., three-story house with each floor being a separate unit)
11. Apartment/condo in a 2-4-unit building
12. Apartment/condo in a 5+ unit building
13. Townhouse or row house (adjacent walls to another house)
14. Mobile home or trailer
56. (Other, [SPECIFY])
99. (Don’t know)

D2. Do you own or rent this residence?

3. Own
4. Rent
56. (Other, [SPECIFY])
99. (Don’t know)

D3. Is the home that we have been discussing, located at [INSERT_ADDRESS], a primary residence?

3. Yes, it is a primary residence
4. No, it is a secondary residence or vacation home
56. Other (Please specify)

D4. Counting yourself, how many individuals typically occupy this home? Enter zero if not occupied for at least six months.

Occupant Type	Number
Adults, 18 and older	[RECORD NUMBER]
Children, under 18	[RECORD NUMBER]

D5. What is the highest level of education that you have completed so far?

8. Less than ninth grade
9. Ninth to twelfth grade, no diploma
10. High school graduate (includes GED)
11. Some college, no degree
12. Associates degree
13. Bachelor's degree
14. Graduate or professional degree
100. Prefer not to answer

D6. Which of the following best describes your age?

10. 18-24
11. 25-29
12. 30-39
13. 40-49
14. 50-59
15. 60-69
16. 70-79
17. 80-89
18. 90 years or older
100. Prefer not to answer

D7_1 **[IF D4=1]** Which of these categories best describes your expected total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $34,001, OR	**[GO TO D8]**
02	$34,001 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_2 **[IF D4=2]** Which of these categories best describes your expected total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $44,463, OR	**[GO TO D8]**
02	$44,463 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_3 **[IF D4=3]** Which of these categories best describes your expected total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $54,925, OR	**[GO TO D8]**
02	$54,925 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_4 **[IF D4=4]** Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $65,387 OR	**[GO TO D8]**
02	$65,387 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_5 **[IF D4=5]** Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

01	Less than $75,849, OR	**[GO TO D8]**
02	$75,849 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_6 **[IF D4=6]** Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

01	Less than $86,311 OR	**[GO TO D8]**
02	$86,311 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_7 **[IF D4=7]** Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

01	Less than $88,272, OR	**[GO TO D8]**
02	$88,272 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D7_8 **[IF D4>=8]** Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

01	Less than $90,234, OR	**[GO TO D8]**
02	$90,234 or more	**[GO TO D8]**
99	Prefer not to answer	**[GO TO D8]**

D8 **[EVERYONE]** Which category best describes your total household income in 2016 before taxes?

01 Less than $10,000
02 $10,000 to $14,999
03 $15,000 to $24,999
04 $25,000 to $34,999
05 $35,000 to $49,999
06 $50,000 to $74,999
07 $75,000 to $99,999
08 $100,000 to $149,999
09 $150,000 to $199,999
10 $200,000 or more
99 Prefer not to answer

D9 Which of the following best describes how your electric bill is paid:

01 I pay my electric bill
02 Someone else pays my electric bill
03 **[IF D2 = 2]** My bill is included in my rent
04 Other [SPECIFY]
88 Don’t know
99 Prefer not to answer

CLOSING

Thank you for your participation in this survey.