Appliance Recycling Program Evaluation Report

Evaluation Cycle 1 – Program Year 1

Prepared for:

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Abstract

Guidehouse conducted an impact evaluation, process evaluation and net-to-gross study of Atlantic City Electric's (ACE) Appliance Recycling Program for program year 1 (July 1st, 2021 – June 30th, 2022). The program transitioned from the New Jersey (NJ) Board of Public Utilities (BPU) to ACE on July 1st, 2021. Guidehouse evaluation activities in the first program year primarily focused on developing a robust understanding of the program and the implementer's data collection activities to establish a foundation for future evaluations. Guidehouse conducted a tracking database review to verify savings calculations and fielded online surveys to gather information on quantity and types of measures installed and to gather information on process evaluation, net-to-gross and demographics. Additionally, Guidehouse also conducted interviews with program staff and implementers to deepen our understanding of the challenges experienced for implementation of the program. Guidehouse's impact evaluation results and NTG results are summarized below in Table AB-1 and Table AB-2.

Table AB-1: ACE Appliance Recycling Impact Evaluation Results

Types of Savings	Tracked Savings	FY 2020		FY 2022	
		Evaluated Savings	Realization Rates	Evaluated Savings	Realization Rates
Energy Savings (MWh)	947	948	1.00	948	1.00
Utility Peak Demand Savings (kW)	151	151	1.00	151	1.00

Table AB-2: Net-to-Gross Results

Type	Results
Freeridership	0.60
Spillover	0.00
Net-to-Gross Ratio	0.40

Our recommendations from the impact and process evaluations are described in Table AB-3.

Table AB-3: Appliance Recycling Program Recommendations

Evaluation Area	Recommendation
Process	Offer "after hour" time slots a few times a month and/or drop off events on the weekend to accommodate customers who cannot recycle during normal business hours.
	Service providers must meet the pickup times they commit to. Notify customers and offer to reschedule if they cannot make the pickup time. Set up automated reminders via both text and email to notify customer the day before, the morning of, and an hour or two before the scheduled pickup time.

	Include a phone number and email address for the call center or central point of contact to allow customers to reach out if they have questions. Include a link to a short FAQ in customer facing communication to allow customers to find answers for common questions.
Impact	Conduct deeper QA/QC to capture all kinds of appliances and quantities that were recycled by the customer.
TRM Updates	Review the algorithm used for calculating savings for dehumidifier recycling. The deemed savings value referenced by the NJ Coordinated measure list is from the Rhode Island TRM which does not cite a source.

Executive Summary

Guidehouse conducted an impact evaluation, process evaluation and net-to-gross study for ACE's Residential Appliance Recycling program for PY 1. This program incentivizes customers to recycle working appliances, specifically refrigerators and freezers. The objective of our impact evaluation was to check completeness of the tracking data, evaluability of the data, and verify savings claimed by the implementers. Our evaluation analysis included a tracking data review, verification using surveys and reviewing documentation provided in project files. The tracking database review compared the savings calculated by the implementers with independent calculations conducted by Guidehouse using the New Jersey's protocols. Guidehouse also calculated savings using FY 2022 protocols which are the updated savings algorithms that are likely to be incorporated in the next version of the TRM. Table E-1 below shows the impact evaluation results using the FY 2020 and FY 2022 protocols.

Table E-1: ACE Appliance Recycling Impact Evaluation Results

Types of Savings	Tracked Savings	FY 2020		FY 2022	
		Evaluated Savings	Realization Rates	Evaluated Savings	Realization Rates
Energy Savings (MWh)	947	948	1.00	948	1.00
Utility Peak Demand Savings (kW)	151	151	1.00	151	1.00

Guidehouse also put forth several findings and recommendations to improve the documentation, data availability and savings calculations. Table E-2 below shows the findings and recommendations from the impact evaluation.

Table E-2: ACE Appliance Recycling Impact Evaluation Findings and Recommendations

Measure Type(s)	Finding	Recommendation
Refrigerators & Freezers	A small number of customers indicated that they had recycled additional quantities of appliances than what was listed in the tracking data.	Conduct deeper QA/QC of the appliances that were recycled by the customer.
Dehumidifiers	The current deemed savings value from the NJ TRM for this measure is referenced from the Rhode Island TRM, while the rest of the measures for this program reference the Mid-Atlantic TRM. The Rhode Island TRM does not provide a source for this deemed value.	We recommend reviewing this measure and referencing a TRM that includes a valid source for the savings.

For process evaluation, Guidehouse conducted program staff and implementer interviews to gather information on the delivery, marketing approach, implementation, trade allies, and customer outreach. These interviews also provided information on barriers to increasing participation, experienced by the program staff and implementers. Guidehouse also conducted

online surveys to identify challenges and barriers experienced by customers. Table E-3 below shows the key results, findings, and recommendations from our process evaluation.

Table E-3: ACE Appliance Recycling Process Evaluation Findings and Recommendations

Finding	Recommendation
Customers experienced challenges finding time slots that worked with their schedule.	Offer "after hour" time slots a few times a month to accommodate customers that cannot recycle during normal business hours. Alternatively, consider offering drop off events on the weekend to help provide additional opportunities and flexibility for participants.
Customers expressed frustration with delayed pickup times.	Service providers must stick to the time window they confirmed with the customer. They must communicate to the customer if they are not able to make the time window they originally committed to. We also recommend sending automated texts a day before pickup, the morning of, and an hour or two before the scheduled pickup time to keep the customer informed of pickup times.
Customers expressed frustration with trying to contact a customer service representative.	Include a phone number and email address for the call center or another point of contact on all customer facing materials to address customer questions and concerns. We also recommend including a short FAQ to allow customers to find answers for commonly encountered concerns.

The surveys included questions on awareness, satisfaction, experience in the program, and measure related questions. These surveys also captured net-to-gross and demographics using questions recommended by the SWE. Table E-4. shows the net-to-gross results from this study.

Table E-4. Net-to-Gross Results

Type	Results
Freeridership	0.60
Spillover	0.00
Net-to-Gross Ratio	0.40

Guidehouse notes that this program had 867 unique participants in PY 1. Out of these 89% of the records had the customer's email addresses. This reduced our sample size to 779 customers. Guidehouse received 135 survey responses out of which 134 had usable responses for a response rate of 17.2%.

1. Introduction

1.1 Program Description

The Appliance Recycling program, a sub-program of the Efficient Products Program was previously administered by the New Jersey Board of Public Utilities (NJ BPU) and was transitioned to ACE on July 1, 2021. This program offers rebates to customers for recycling qualifying, inefficient, operating appliances. The program offers an incentive for the drop off or pick-up and removal of an inefficient, operating appliance that prevents the appliance being maintained as a second unit or transferred to another customer. This program currently offers recycling for room air conditioners, dehumidifiers, refrigerators, and freezers.

Table 1-1 below provides PY 1 program planned savings and reported savings. The PY 1 population consisted of 779 unique customers and a total of 904 combined measures installed.

Table 1-1: PY 1 Program Participation and Reported Savings

Measure	Planned Savings*	Reported Savings	Reported Energy Savings as a % of Portfolio Energy Savings
Energy Savings (MWh)	1,021	947	4%
Peak Demand Savings (kW)	14	151	

Note: The planned savings in the table is estimated based on ACE's planned savings filed for Efficient Products program.

1.1.1 Program Population

Guidehouse organized the impact results based on measure types. This allows for the investigation of savings results from specific measures and provides more focused recommendations. Table 1-2 shows the total number of participants and savings from the program in PY 1.

Table 1-2: PY 1 Appliance Recycling Program Survey Population

Measure Strata	Total Measures	Total Reported Energy Savings (MWh)	Total Reported Peak Demand Savings (kW)
Refrigerators	750	824	123
Freezers	152	109	16
Room Air Conditioners	85	8	8
Dehumidifiers	35	7	4
TOTAL	922	948	151

1.2 Conclusions and Recommendations

Guidehouse had the following conclusions and recommendations from the PY 1 evaluation:

- Impact Evaluation
    - Guidehouse identified discrepancies in the quantities of recycled appliances reported by customers in surveys when compared with those reported in the tracking data. Two respondents indicated a higher quantity of recycled appliances than indicated in the tracking data, which led to a slightly higher evaluated savings and consequentially energy and demand realization rates slightly higher than 100%. We recommend additional QA/QC to ensure that the quantities of incentivized recycled appliances are accurate.
- TRM Updates
    - The deemed savings value used in the Rhode Island TRM and referenced by the NJ Coordinated measures list does not include a primary source for the savings. We recommend the TRM committee review this measure closely, benchmark the savings with other TRMs, and use a deemed value that is backed by research.
- Process Improvements
    - Some customers were not able to schedule pick up times during normal business hours as it conflicted with their work schedules. We recommend offering “after hour” time slots a few times a month and/or, drop off events on weekends to reduce the challenges for such customers to participate in the program.
    - Customers expressed frustration with delays in pick up times. To address this issue, we recommend:
        - Service providers stick to pick up times they commit to. If they cannot make the pickup times, they must call the customer and check if their schedule allows them to come at a later time or offer to reschedule.
        - We also recommend setting up an automated system to remind customers about the pickup times.
    - Customers experienced challenges in connecting with a customer service representative. We recommend including an email address and phone number for the contact center to address customer’s concerns and, include a short FAQ to answer commonly encountered questions.

2. Evaluation Analysis

This section presents the results of our PY 1 evaluation. Section 2.1 of this report compares our results with similar utilities. Section 2.2 speaks to the evaluability concerns for this program. Sections 2.3, 2.4 and 2.5 discuss the methodology and results from our impact, process and net-to-gross studies. Section 2.6 includes our cost-effectiveness results.

2.1 Benchmarking

This section provides comparison of the evaluation results with similar utilities.

2.1.1 Savings and Realization Rates

Guidehouse compared the savings and realization rates (RRs) of ACE's Appliance Recycling Program with similar programs offered by other utilities. Table 2-1 shows the difference in savings and realization rates between ACE and peer utilities.

Table 2-1: Appliance Recycling Program Impact Evaluation Benchmarking

Utility	Program Size - Gross Reported Energy Savings (MWh)	Energy Savings per Participant (kWh)	Peak Demand Savings per Participant (kW)	Energy RR	Peak Demand RR
Delmarva	253	885	0.14	0.89	0.94
PECO	8,480	908	0.18	1.06	1.04
BGE	4,145	917	0.14	0.97	1.03
Pepco	966	950	0.15	0.88	0.91
ACE	**947**	**958**	**0.15**	**1.00**	**1.00**
SMECO	999	972	0.15	0.94	0.98
Potomac Edison	2,102	1,072	0.17	0.88	0.92
Midwestern utility	38,152	1,005	0.12	0.90	0.89

2.1.2 Measure Mix

ACE's Appliance Recycling program offers similar measures and rebate amounts as peer utility programs. All utility programs only offer the additional incentive when customers recycle an old working air conditioner or dehumidifier at the same time as the refrigerator or freezer.

Table 2-2: Residential Appliance Recycling Program Measure Mix Benchmarking

Measures Offered by ACE's Res Appliance Recycling Program	Measures Offered by Peer Utilities
Room air conditioners ($25) Dehumidifiers ($25) Refrigerators/Freezers ($50)	Room air conditioners ($10-25) Dehumidifiers ($25-$35) Refrigerators/Freezers ($50-$100)

2.1.3 Process Evaluation Results

Table 2-3 below shows the process results of ACE's Appliance Recycling program benchmarked with another similar utility. Guidehouse notes, these results are based on a small population and will likely change as the program gets larger and the survey gets more responses in PY 2.

Table 2-3: Residential Appliance Recycling Program Process Benchmarking

Focus Area	ACE (n=134)	Midwestern Utility (n=941)
Program Awareness	Bill inserts (27%), ACE's website (15%), and word of mouth (12%)	Word of mouth (26%), TV (19%), website (16%)
Program Satisfaction	Program satisfaction: **4.79** using a 1-5 scale. Dissatisfaction was primarily driven by confusion with the agency regarding pickup times	Program satisfaction: **96%** using a 0-10 scale, satisfaction is calculated using percentage of applicable responses that rate satisfaction with the program as 6 or higher
Other Satisfaction	Rebate satisfaction: **4.74** - the primary driver of dissatisfaction was with the rebate delivery process, primarily the delay in receiving rebate funds	Rebate satisfaction: **86%**
Barriers	Finding available service slots and/or experiencing delays and confusion with pickup times (77%)	NA

2.1.4 Net-to-Gross

Table 2-4 below shows the results of ACE's Appliance Recycling program benchmarked against other utilities with similar programs. Based on the results, the NTG for ACE is comparable to both benchmarked utilities, but spillover results vary slightly which results in a relatively lower Net-to-Gross ratio.

Table 2-4: Net-to-Gross Results Benchmarked with Other Utilities

Utility	Freeridership	Participant Spillover	NTGR
Atlantic City Electric	0.60	0.00	0.40
Midwestern Utility	0.52	0.03	0.51
EmPOWER (five utilities in Maryland)	-	-	0.42

2.2 Evaluability

The accuracy and comprehensiveness of program tracking data is critical to conduct an effective evaluation. For PY 1, Guidehouse used the tracking database to obtain contact information for customer surveys and savings calculation inputs (such as customer contact information, measure information, equipment manufacturer and model information, etc.) as part of a basic rigor evaluation. Guidehouse did not find any evaluability concerns with the tracking data and data collection methods used by the implementers.

2.3 Impact Evaluation

2.3.1 Impact Evaluation Overview and Methodology

Guidehouse applied industry-standard methods and approaches to conduct the evaluation as established in the following documents:

- Uniform Methods Project (UMP)[1]
- NJ Coordinated measure list – approved by NJ utilities for estimating savings for PY 1.
- New Jersey's Clean Energy Program Protocols (NJCEP) FY 2020[2] and FY 2022

To estimate evaluated savings, Guidehouse calculated energy and peak demand savings for the Appliance Recycling Program using FY 2020 and FY 2022 New Jersey protocols. The FY 2022 protocols included updates recommended by the Technical Reference Manual (TRM) working group.

2.3.1.1 Evaluation Objectives

The following are the key objectives this first impact evaluation addresses:

- Review the data being collected by the implementation contractor (IC) and establish data collection requirements for different types of measures offered by the program.
- Establish a smooth process for transfer of tracking data and project files with the aim of streamlining the process for future evaluations.

[1] See Department of Energy, Office of Energy Efficiency and Renewable Energy website at http://energy.gov/eere/about-us/ump-home.

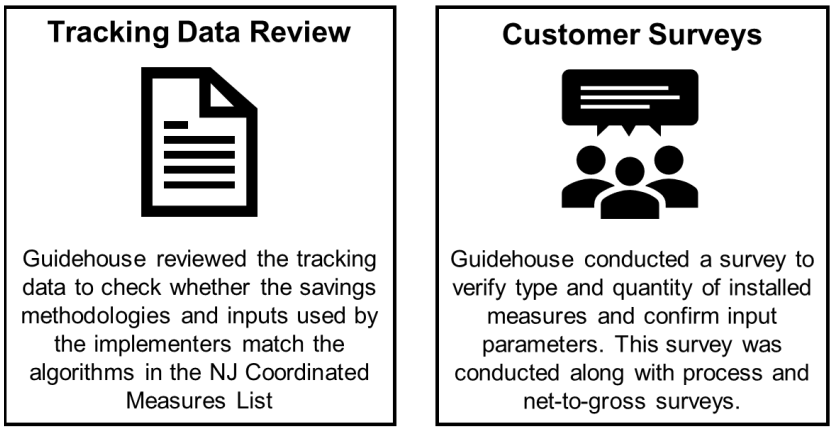
[3] See New Jersey's Clean Energy Program website at https://njcleanenergy.com/files/file/NJCEP%20Protocols%20to%20Measure%20Resource%20Savings%20FY20_FINAL.pdf

- Calculate evaluated gross energy and peak demand savings using the NJCEP Protocols.
- Calculate savings using new and revised measures developed by New Jersey's TRM working group.
- Highlight areas for the implementation team to improve data collection, estimate savings, etc.
- Highlight gaps or inaccuracies in the NJCEP Protocols.
- Benchmark ACE's program with similar programs implemented by other utilities in the US.

2.3.1.2 Evaluation Methods and Tools

Guidehouse used two methods to conduct the impact evaluation for this program: a tracking data review to verify the methods used by the implementers and customer surveys to verify installation type and quantity. The verified gross energy and peak demand savings for the program were calculated from these results. Figure 1 demonstrates the evaluation methodologies used for impact evaluation, with more details located in Appendix A1.

Figure 1: Impact Evaluation Methodology for ACE's Residential Appliance Recycling Program



2.3.2 Impact Evaluation Results

2.3.2.1 Program-Level Verified Gross Energy and Peak Demand Savings

Guidehouse calculated two sets of evaluated savings. The first set was based on the FY 2020 protocols (also referenced as NJ Coordinated Measures list) discussed and agreed on by utilities in NJ and the SWE for the first year of savings calculations. The second set (FY 2022 protocols) included updates recommended by the Technical Reference Manual (TRM) working group. The second set of evaluated savings are only for informational purposes and will not count toward the goals set by the NJ BPU.

The evaluation team calculated savings for rebate-eligible appliances and found that the FY2022 Addendum calculations yielded the same evaluation results as the savings calculated using the methodology specified in the FY2020 New Jersey Protocols. Table 2-5 and Table 2-6 show the program-level savings and realization rates using FY 2020 and FY 2022 NJ Savings Protocols, respectively.

Table 2-5: PY 1 Appliance Recycling Program Calculated Savings using FY 2020 Protocols

Program	Tracked Energy (MWh)	Tracked Peak Demand (kW)	Evaluated Energy FY 2020 (MWh)	Evaluated Peak Demand FY 2020 (kW)	FY 2020 Energy RR	FY 2020 Peak Demand RR
Appliance Recycling	947	151	948	151	1.00	1.00

Table 2-6: PY 1 Appliance Recycling Program Calculated Savings using FY 2022 Protocols

Program	Tracked Energy (MWh)	Tracked Peak Demand (kW)	Evaluated Energy FY 2022 (MWh)	Evaluated Peak Demand FY 2022 (kW)	FY 2022 Energy RR	FY 2022 Peak Demand RR
Appliance Recycling	947	151	948	151	1.00	1.00

2.3.2.2 Measure-Level Verified Gross Energy and Peak Demand Savings

Table 2-7 and Table 2-8 shows the measure-level savings and realization rates using FY 2020 and FY 2022 NJ Savings Protocols, respectively. The FY 2020 and FY 2022 realization rates are calculated relative to the reported energy and peak demand savings.

Table 2-7: PY 1 Appliance Recycling Measure-Level Savings Calculated Using FY 2020

Measure	Ex Ante Energy (MWh)	Ex Ante Peak Demand (kW)	Ex Post Energy FY2020 (MWh)	Ex Post Peak Demand FY2020 (kW)	Energy RR	Peak Demand RR
Refrigerators	824	123	825	123	1.00	1.00
Freezers	109	16	109	16	1.01	1.01
Room Air Conditioners	8	8	8	8	1.00	1.00
Dehumidifiers	7	7	4	4	1.00	1.00

Table 2-8: PY 1 Appliance Recycling Measure-Level Savings Calculated Using FY 2022

Measure	Ex Ante Energy (MWh)	Ex Ante Peak Demand (kW)	Ex Post Energy FY2022 (MWh)	Ex Post Peak Demand FY2022 (kW)	Energy RR	Peak Demand RR
Refrigerators	824	123	825	123	1.00	1.00
Freezers	109	16	109	16	1.01	1.01
Room Air Conditioners	8	8	8	8	1.00	1.00
Dehumidifiers	7	7	4	4	1.00	1.00

2.3.3 Key Findings and Recommendations

2.3.3.1 Recommendation Summary

Table 2-9 presents the Guidehouse evaluation team's impact findings and recommendations.

Table 2-9: Appliance Recycling Program Impact Findings and Recommendations

Measure Type(s)	Finding	Recommendation	Impact
Refrigerators & Freezers	A small number of customers indicated that they had recycled additional appliances than what was listed in the tracking data.	Recommend reviewing customer information to ensure quantities are correct on a measure level basis.	Improved savings accuracy

2.3.3.2 TRM Updates

The NJ TRM currently uses a deemed energy savings value of 196 kWh per year for recycling of dehumidifiers, which is incorporated by reference from the 2016 version of the Rhode Island TRM. The measure in the RI TRM does not provide any study or source to back up the deemed savings value.

The 2020 version of the RI TRM updated the deemed savings value to 152.7 kWh per year and references, "Energy Star Dehumidifier Savings estimate 2015-9-22" as the source. The mid-Atlantic TRM also provides an algorithm to calculate the savings from recycled dehumidifiers instead of a fixed deemed value.

Given these discrepancies, we recommend conducting additional review and update of the Dehumidifiers measure for the next version of the NJ TRM by the TRM committee. This includes reviewing this measure in different TRMs and incorporating an algorithm or deemed value that is backed up by a valid source.

2.4 Process Evaluation

2.4.1 Process Evaluation Overview and Methodology

To obtain process findings, Guidehouse reviewed the program materials and tracking database, surveyed customers, and interviewed program implementors and program managers to identify areas for improvement and barriers to participation.

2.4.1.1 Process Evaluation Objectives

The objective of the process evaluation was to better understand what is going well and what could be improved in the program. The SWE's guidance for such programs recommends conducting a process evaluation with the objectives outlined in Table 2-10. Guidehouse used the guidance provided by the SWE to define the objectives for this process evaluation.

Table 2-10: Process Evaluation Objectives

Overall Objective	Detailed Objectives
Document changes from NJ BPU to IOU	Document the changes that occurred in the program implementation and what stayed the same when the IOU began implementing the program.
Participation	Document participation rate, closing rate, project completion rate, number of participants, partial participants and, where possible, compare with NJ BPU management.
End-user satisfaction	Satisfaction with all key steps and elements of the program process by end users, reasons for participation, challenges to participation, decision-making, reasons for adoption or rejection of recommended measures, and suggestions to address challenges and barriers.
Program staff satisfaction	Satisfaction with the back-office processes by the implementation team; cycle time findings for back-office processes.
Implementation team satisfaction	Satisfaction with all key steps and elements of the program processes by market actors involved in program delivery and for market actors involved in NJ BPU period request assessment of any differences, their reasons for being in the program, challenges to participating in the program, access to products, reasons for recommending services and products, comparison of experiences prior to and during program, and suggestions to address challenges and barriers.
Challenges	Document any difficulties with program-related efficiency products from end user, trade ally, and implementation team perspectives such as availability, quality of materials, installation, quality of product, waiting times, etc. Differentiate COVID-19-related causes where possible.

2.4.2 Process Evaluation Results

Table 2-11 presents the participant survey disposition from the online surveys. The survey response rate was 17.2%. The process evaluation results presented in this report were based

on the customer survey and information gathered from program staff and implementation contractor interviews.

Table 2-11: Appliance Recycling Participant Survey Disposition

Description	Count
Unique participants	867
Unique participants with emails	779
Survey responses	135
Screen outs	1
Usable responses	134
Response rate	17.2%

Note: 'Screen outs' refers to customers that could not provide information on their participation in the program. 'Usable responses' are the total number of surveys minus the screened out customers.

The remaining sections provide the process evaluation survey results by topic.

2.4.2.1 Program Satisfaction

The Appliance Recycling program scored 4.79 on program satisfaction using a scale of 1-5, where 1 is extremely dissatisfied and 5 extremely satisfied. Dissatisfaction was primarily driven by confusion regarding appliance pickup times.

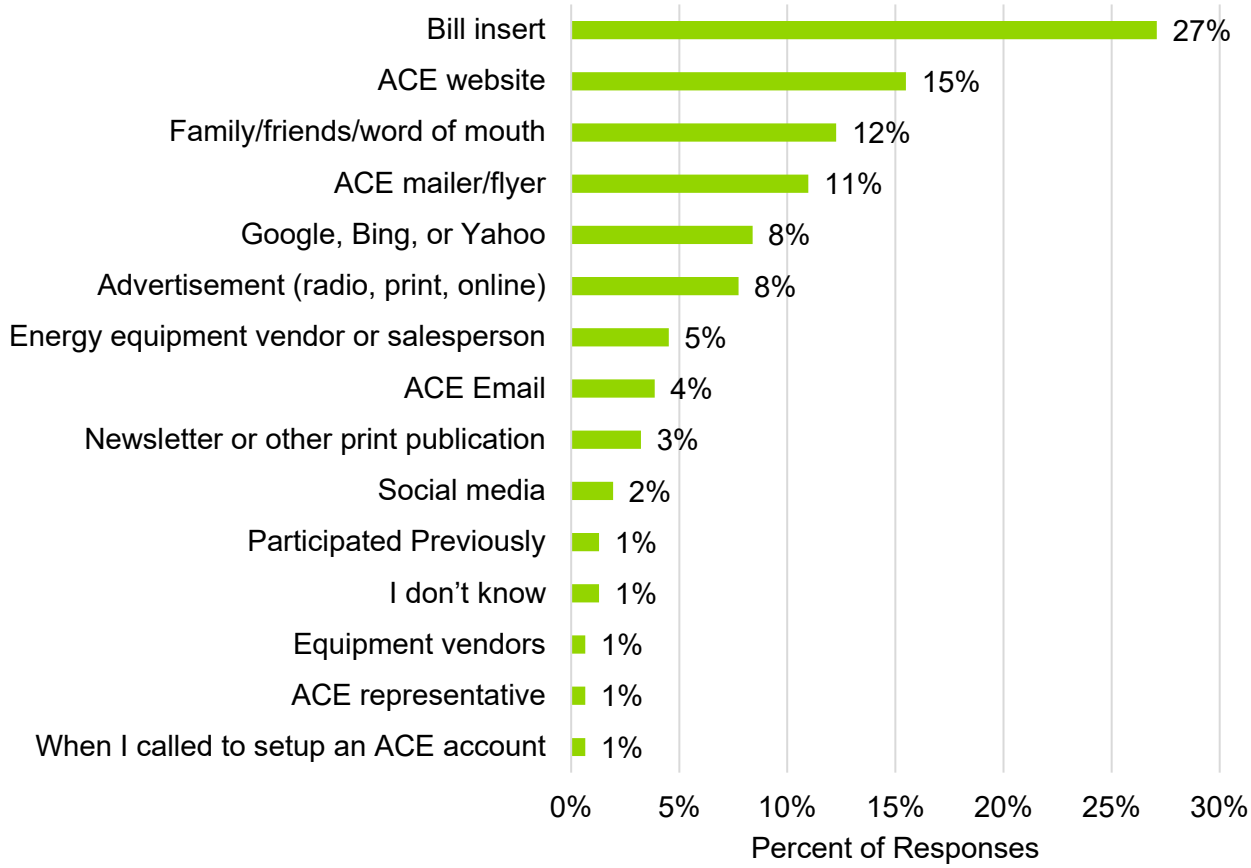
The program received a satisfaction score of 4.74 on the rebate. The primary driver of dissatisfaction was with the rebate delivery process, primarily a delay with some customers receiving rebate funds.

In PY 2, Guidehouse will implement a 9-point satisfaction scale to better assess customer's sentiment on the above mentioned factors.

2.4.2.2 Program Implementation

Through the online survey Guidehouse found that respondents learned about the program through bill inserts (27%), ACE's website (15%), and word of mouth (12%). Less common methods of learning about the program were previous program participation, equipment vendors, the account setup process, and an ACE representative (all 1% or less). Other benchmarked programs had similar top awareness channels; word of mouth (26%), TV (19%), and utility website (16%), as seen in Figure 2.

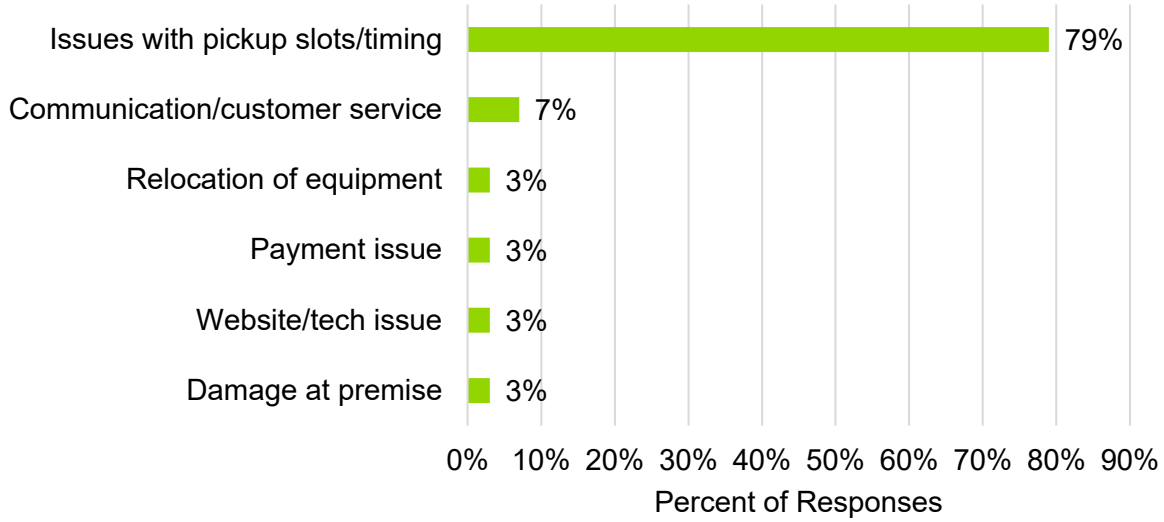
Figure 2: Appliance Recycling Program Customer Awareness



2.4.2.3 Challenges

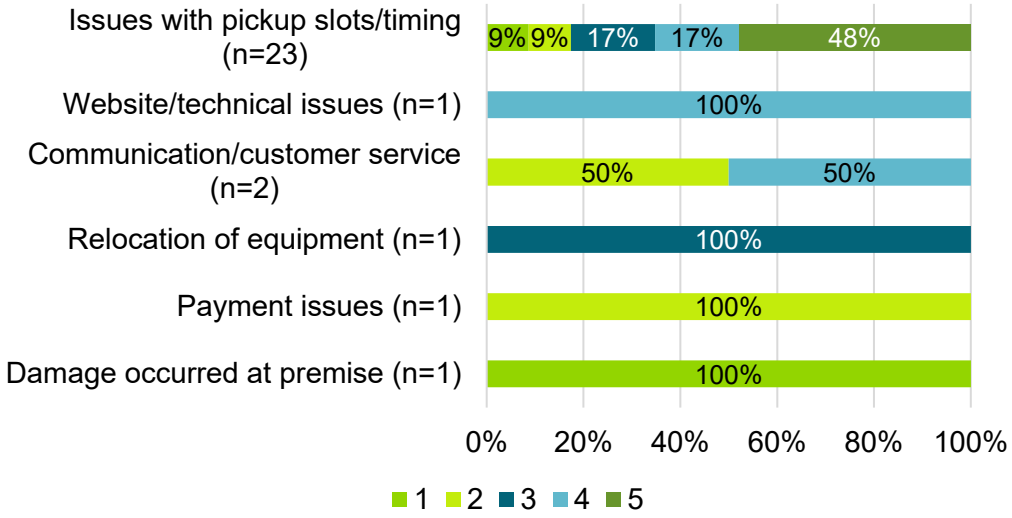
The primary barrier customers experienced was finding available pickup slots and/or experiencing delays and confusion with pickup times (79% or n=23). One respondent stated, "They canceled my original chosen pick up date, without my consent. Very frustrating." Another customer stated, "They claimed they tried to pick it up but came to wrong house." Customers also reported the pickup crew damaging property during appliance removal (3% or n=1), dissatisfaction with presented website information (3% or n=1), and difficulty relocating recycled appliances for pickup (3% or n=1), as seen in Figure 3.

Figure 3: Appliance Recycling Program Challenges and Barriers[3]



Customers also experienced issues with the lack of communication provided by program representatives and their level of customer service. One respondent expressed their frustration by sharing that it was, “Difficult to find the right person to schedule. Was transferred back and forth from Atlantic Electric and the recycle company.” Figure 4 outlines customer reported severity ratings for each of the challenges identified above.

Figure 4: Appliance Recycling Program Challenges and Barriers Severity Ratings

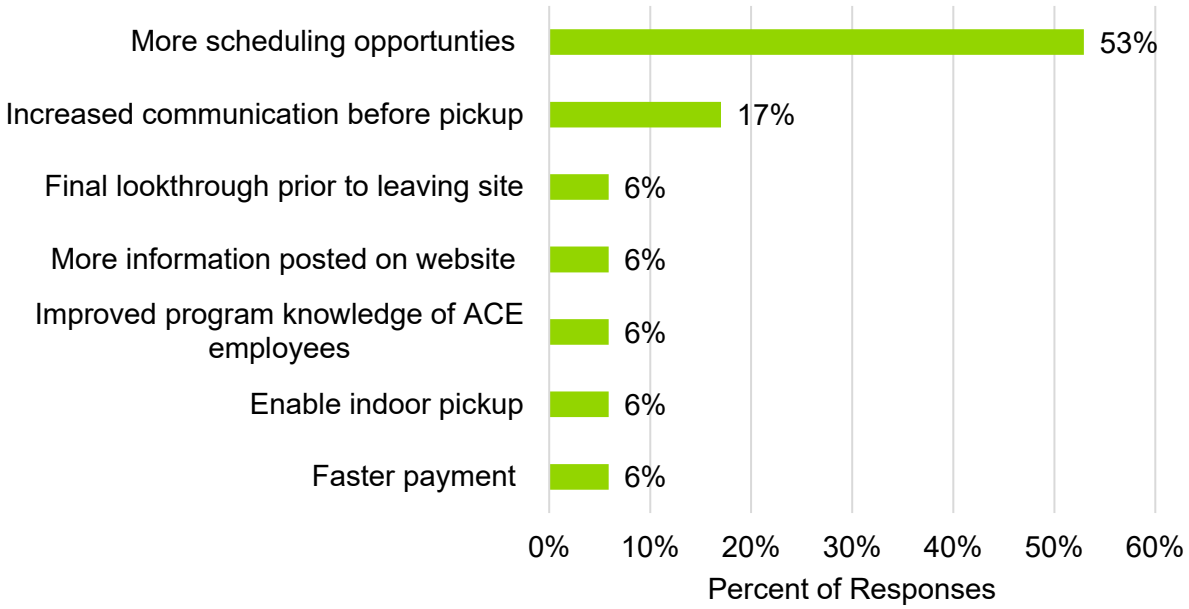


Note: The 1-5 scale represent the severity of the challenge or barrier experienced by the customer. One represents not at all serious and 5 represents a very serious challenge as perceived by the customer.

[3] Customers were encouraged to provide up to three barriers or challenges experienced, thus the total number of challenges may exceed the number of surveys respondents.

Customers provided suggestions (outlined in Figure 5) to mitigate these challenges.

Figure 5: Appliance Recycling Program Customer Suggestions



2.4.3 Key Findings and Recommendations

Table 2-12 presents the Guidehouse evaluation team's process findings and recommendations.

Table 2-12: Appliance Recycling Program Process Findings and Recommendations

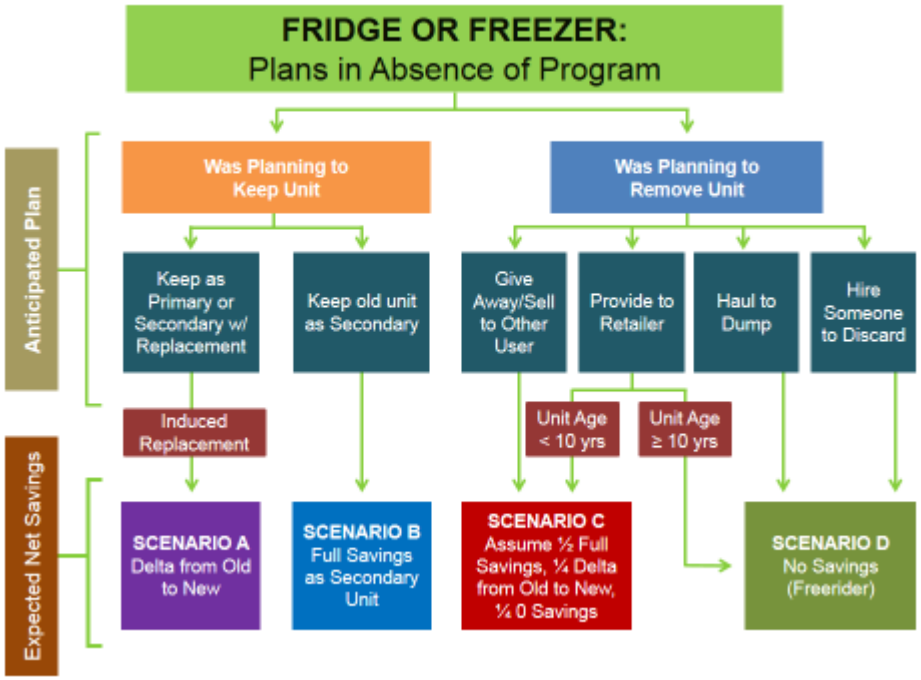
Finding	Recommendation	Impact
Customers experienced challenges finding time slots that worked with their schedule.	Offer "after hour" time slots a few times a month and/or drop off events on the weekend for customers who are not available during normal business hours.	Increase participation, increase satisfaction
Customers expressed frustration with delayed pickup times.	Consider increasing the frequency of communication to the customer prior to pick up to help set expectations. For example, automate text reminders to the customer the day before pickup, the morning of, and an hour or two before the scheduled pickup time.	Increase satisfaction
Customers expressed frustration with the level of customer service.	Consider including a short FAQ with the time slot confirmation email, as this may help to reduce customer confusion. It may also be helpful to include the call center or another point of contact on all materials to aid in customer inquiry.	Increase satisfaction

2.5 Net-to-Gross Evaluation

2.5.1 Net to Gross Data Collection Methodology

Guidehouse used the self-report method to calculate NTG ratios and net savings by estimating freeridership in a single survey to obtain a net to gross (NTG) value for the Appliance Recycling program. The Appliance Recycling program differs from other ACE programs such as Residential HVAC or Appliance Rebates. Here the incentive is paid to remove old efficient equipment from being operated. Therefore, we were not able to use the NTG methodology recommended by the SWE which was primarily designed for widget installation or replacement programs such as Residential HVAC and Appliance Rebates. Instead, Guidehouse implemented a different methodology to calculate net savings. This method is outlined in Figure 6 below.

Figure 6: Diagram to Determine Appliance Recycling Net Savings



Source: UMP Protocols

Based on this methodology, freeridership is based on the participant's anticipated plans had the program not been available. A freerider is classified as one who would have removed the unit from service irrespective of the program. Net savings for the program is therefore based on the participant's anticipated continued operation of the appliance– either as a primary or secondary unit, within their home or transferred to another home (either directly or indirectly).

2.5.2 Net-to-Gross Results and Key Findings

For the Appliance Recycling program, Guidehouse found a freeridership value of 0.60 (illustrated in Table 2-13) among participants, which produces a NTG ratio (NTGR) of 0.40. Spillover was not included as part of this research.

When compared to other utility programs, the NTGR is comparable to other benchmarked recycling program.

Table 2-13: Program Year 2021 Appliance Recycling Program NTGR

Freeridership	Participant Spillover	NTGR
0.60	**0.00**	**0.40**

Freeridership was driven primarily by the customer group designated as “removers” (70%), which are defined as those who were planning on removing the unit regardless of the program. “Keepers” which are defined as customers planning to keep the unit if the program did not exist, was a lesser percentage (30%) of survey respondents.

Guidehouse also analyzed the Appliance Recycling Program on a measure level basis and developed measure specific NTGRs (illustrated in Table 2-14). Most measures had comparable NTGRs, except dehumidifiers (0.75), which had a lower freeridership score.

Table 2-14: Program Year 2021 Appliance Recycling Program Measure Level NTGRs

Measure	n values[4]	Freeridership	Participant Spillover	NTGR
Dehumidifiers	12	0.25	0.00	0.75
Room Air Conditioners	13	0.48	0.00	0.52
Freezers	30	0.56	0.00	0.44
Refrigerators	103	0.62	0.00	0.38

[4] Customers could report up to two recycled measures.

2.6 Cost Effectiveness

Guidehouse collected adequate data to support a portfolio-wide cost effectiveness analysis for this program and adhered to the New Jersey Cost Test (NJCT). For PY 1, the program costs available to Guidehouse were aggregated for all Efficient Products programs combined. Costs were not disaggregated by sub-program (i.e., Appliance Recycling, Residential HVAC, Appliance Rebates, etc.). Therefore, Guidehouse calculated cost effectiveness for all Efficient Products programs grouped together as a single program.

The NJCT was developed as the primary test to evaluate the benefits and costs of EE and PDR programs established in the state pursuant to the Clean Energy Act (CEA) during the first three-year program cycle, starting with PY 1 on July 1, 2021, and running through the end of program year 3 (PY3) on June 30, 2024.

Guidehouse calculated six cost tests for ACE's Efficient Products program, including the New Jersey cost test as defined in New Jersey BPU Order 8A[5]. Administrative costs were not tracked by sub-program in a manner that allowed for sub-program level cost testing. The Appliance Recycling sub-program contributed 4.03% of the Efficient Products program's NJCT benefits. Cost test results presented in Table 2-15 and Table 2-16 were calculated using net ex-post savings. The Efficient Products program achieved a NJCT ratio above 1.0.

Table 2-15: Net Efficient Products Program Cost Test Results

Program	Source	NJCT	PCT	PACT	RIMT	TRCT	SCT
Efficient Products		2.49	14.99	0.80	0.22	0.85	1.03

Table 2-16: Efficient Products Program NJCT NPV Benefits and Costs

Program	NPV Benefits ($1,000)	NPV Costs ($1,000)	Net Benefits ($1,000)
Efficient Products	$6,866	$4,820	$4,110

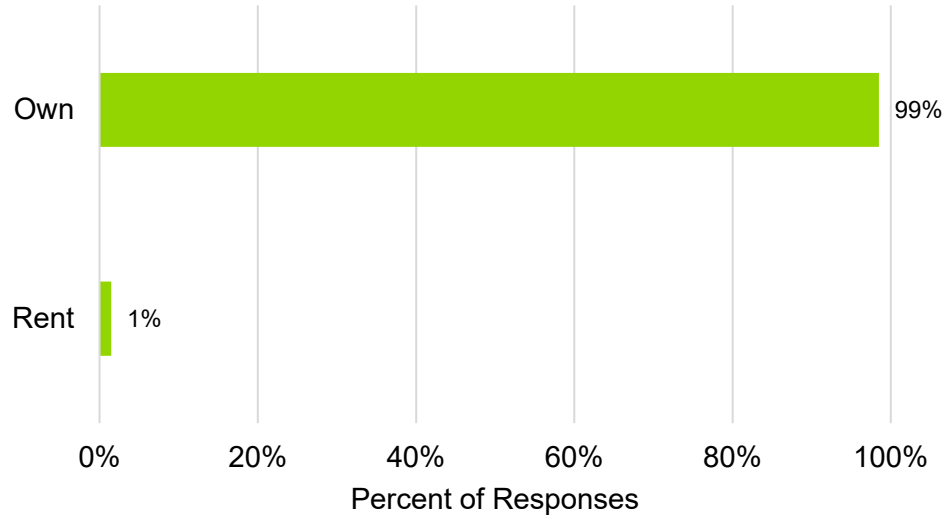
[5] https://www.state.nj.us/bpu/pdf/boardorders/2020/20200824/8A%20-%20ORDER%20New%20Jersey%20Cost%20Test.pdf

Appendix A. Survey Demographics

The overwhelming majority of survey respondents (99%) own their own home, with 80% indicating a single-family dwelling, as seen in Figure 7. Other home types include duplex (6%), row home (6%), apartment (4%), and mobile home or trailer (4%). Additionally, most homes (76%) were reported as 3,000 square feet or less, with roughly 12% reported a square footage of 3,000 square feet or larger.[6]

In comparison, owner-occupied housing rate for NJ State in the state census[7] is reported at 63.8%.

Figure 7: Homeownership Status



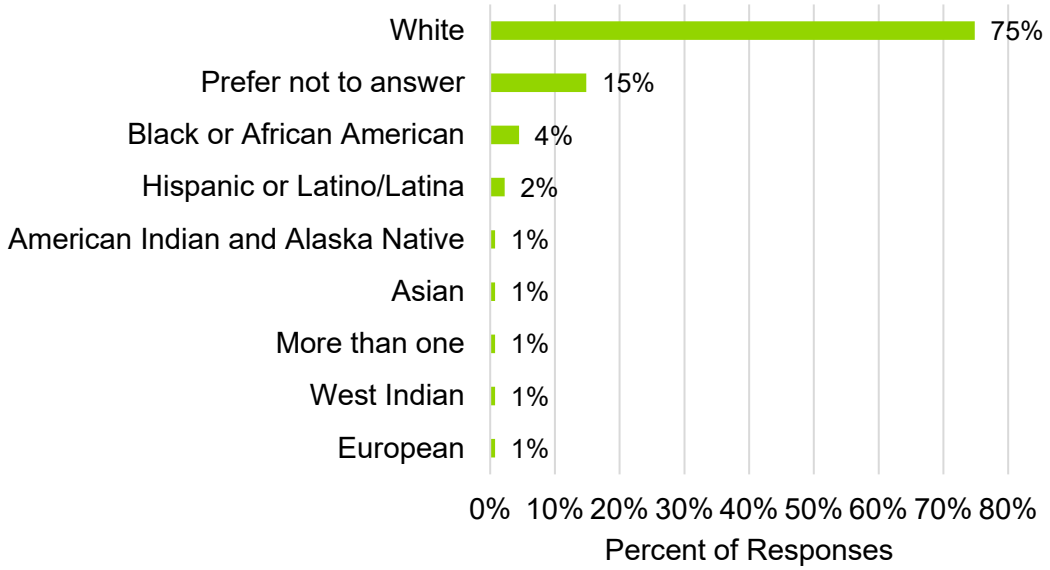
Shown in Figure 8, survey respondents are primarily identifying as white (75%) or black or African American (4%). 15% of customer preferred not to answer this question. In comparison, the NJ state census reports the population to be 53.5% White (not Hispanic or not Latino), 15.3% Black or African American, 21.5% Hispanic or Latino and 10.3% Asian.

Respondents overwhelmingly reported that English was the primary language spoken at home (97%). In comparison, the NJ State census reports 31.9% of people aged 5+ spoke a language different than English at home.

[6] Twelve percent of respondents did not know the square footage of their home.

[7] https://www.census.gov/quickfacts/NJ

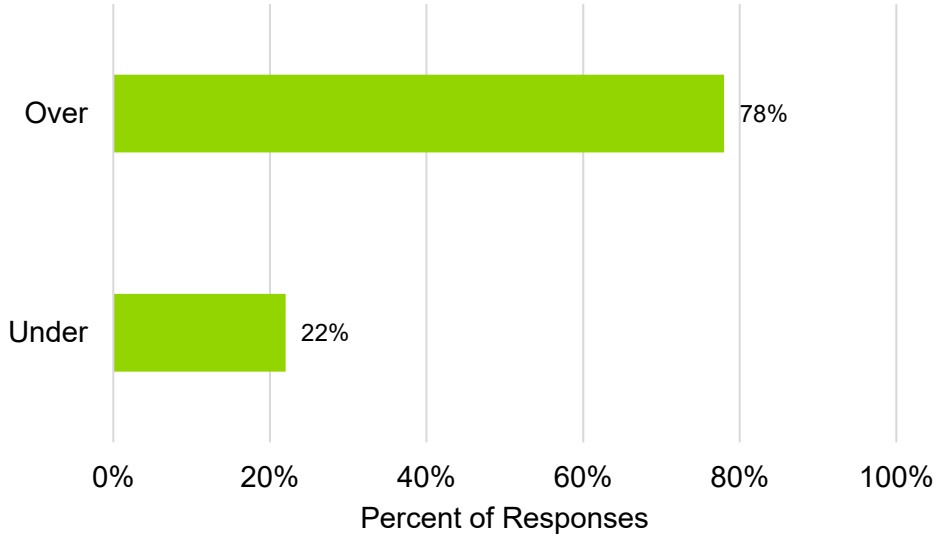
Figure 8: Survey Respondent's Race



Most respondents (87%) reported between one and four occupants in the home. In comparison, homes in NJ per NJ State census reported an average of 2.66 persons per household.

When asked about annual household income levels, 78% of customers reported their income was over the survey base level of 250% of the federal poverty guidelines, as shown in Figure 9.

Figure 9: Income Status Relative to 250 Percent of Federal Poverty Guidelines



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