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Energy Efficiency / Demand Response Plan: Plan Year 3 (6/1/2010-5/31/2011)

Evaluation Report: Residential Appliance Recycling

Presented to

Commonwealth Edison Company

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Presented by

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Table of Contents

Section E. Executive Summary

E.1 Evaluation Objectives

The goal of this report is to present a summary of the findings and results from the evaluation of the Program Year 3 (PY3) Residential Appliance Recycling (AR) program. The objectives of the evaluation are to: (1) quantify net energy and peak demand savings impacts from the program during Program Year 3 (PY3); and (2) to determine key process-related program strengths and weaknesses and provide recommendations to improve the program.

E.2 Evaluation Methods

To estimate gross energy savings, we have relied heavily on data from extensive research elsewhere, including, for refrigerators and freezers, regression equations for estimating refrigerator and freezer Unit Energy Consumption (UEC) that are based on a large database of over 2,000 previously metered units in California based on the U.S. Department of Energy's (DOE) lab metering approach. The regression equations estimate usage as a function of unit characteristics (age, size, configuration, and defrost mode). The characteristics of units collected by JACO Environmental (JACO) for ComEd were then input into these models to estimate full-year UECs (representing kWh savings) that are specific to ComEd's program.

Our primary data collection activity for the gross and net impact calculations was a telephone survey of program participants. The participant survey was used to determine a part-use factor and the program net-to-gross (NTG) ratio, and to support the process evaluation. In addition, telephone surveys with used appliance haulers in the secondary market were attempted, in part, to corroborate assumptions in the NTG calculation related to appliance disposal methods. Ultimately, we were not able to use these findings for this purpose due to the small number of interviews completed and the fact that they largely remove non-working appliances.

The part-use factor was used to adjust the annualized UEC estimates to reflect the number of months the recycled unit would have been operated absent the program. This element of the calculation is particularly important for ComEd's program, since refrigerators and freezers located in garages may have been shut down during the winter months, when cold weather reduces or eliminates the need to run the unit. Similarly, room air conditioner (AC) units may only have been operated during a few of the hottest days during the summer months.

Table E-1 below summarizes the key data collection activities in support of this evaluation.

Table E-1. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
Tracking Data Analysis	All Program Participants	Tracking Database	-	All	Ongoing
In-depth Phone Interviews	ComEd Program Manager	Contact from ComEd	Current and former AR PMs	2	March 29, 2011
	Implementation Contractor	Contact from ComEd	IC Retail Program Manager	2	April 8, 2011 and May 5, 2011
	Participating Retailers	Contacts from Program Implementer	Representatives from all three participating retailers	4 total – two from 1 retailer	July 1, 8 and 15, 2011
	Non-participating retailers	Internet Search – Any retailers other than the three participating retailers	Representatives from non-participating retailers	4	July 29, August 1-3
	Used Appliance Disposal and Hauling Services	Internet Search	Representatives from local haulers	2	August 3-4
CATI Phone Surveys	Program Participants	Tracking Database	Stratified Random Sample of AR Program Participants	202 Total – 151 Refrig., 51 Freezer, 30 Room AC Recyclers	August 2011

E.3 Key Impact Findings and Recommendations

The Residential Appliance Recycling program began operation in June 2008. This was its third full year of operation. The program offers free pickup and recycling services for older, working refrigerators and freezers, and room air conditioners. Program savings are based on the accelerated removal, dismantling and recycling of these older, inefficient units. In exchange for participating in the program, ComEd currently pays participants $35 each for up to two recycled refrigerators or freezers. The incentive had been $25 per recycled unit during PY1 and PY2, but was increased in November 2010 in an effort to boost participation in order to meet increased PY3 goals. Operational room air conditioner units are also eligible for pick up and recycling, but they can only be picked up from sites where the recycler, JACO, is already collecting a refrigerator and/or freezer (so the room AC unit can "ride for free"). Participants contributing these working room AC units also receive the $35 program incentive, in conjunction with the pickup of either a refrigerator or freezer. However the incentive is capped at 2 units per pickup. If a room AC unit is also being collected with both a refrigerator and freezer, the participant is paid $35 each, or a maximum of $105 per scheduled visit.

A total of 41,024 units were picked up by the program during PY3. Over 80% of these units were refrigerators, another 15% were freezers, and just 2% were room air conditioners. Table E-2 below provides the breakdown of recycled units by measure type.

Table E-2. Summary of Recycled Units by Appliance Type

Measure Type	Number of Units	Percent of Units
Refrigerators	33,937	83%
Freezers	6,046	15%
Room Air Conditioners	1,041	2%
Total Units Recycled	41,024	100%

Table E-3 below provides the third-year evaluation-adjusted gross and net MWh savings estimates for each measure and for the program overall. Table E-4 shows the comparable values for kW savings.

Table E-3. PY3 Gross and Net Impact Parameter and Savings Estimates (MWh)

Gross and Net Impact Parameter and Savings Estimates	Refrigerators	Freezers	Room AC	Total Program
Total units recycled through the Program	33,937	6,046	1,041	41,024
Verified Annual MWh Savings Impacts				
Verified annual Gross kWh savings per unit (full-load operating hours)	1,855	1,912	---	---
Part-Use Factor	90%	75%	---	---
Verified annual Gross kWh savings per unit adjusted for part-use	1,674	1,440	80	---
Verified Program Gross MWh	56,804	8,705	83	65,592
Net-to-Gross Ratio (1-Free Rider %)	0.67	0.75	0.70	0.68
Total Third-Year Evaluation-Adjusted Net MWh Savings	**38,264**	**6,529**	**58**	**44,851**

Table E-4. PY3 Gross and Net Impact Parameter and Savings Estimates (kW)

Gross and Net Impact Parameter and Savings Estimates	Refrigerators	Freezers	Room AC	Total Program
Total units recycled through the Program	33,937	6,046	1,041	41,024
Verified Annual kW Savings Impacts				
Annual Gross kW savings per unit (full-load operating hours)	0.30	0.26	0.04	---
Program Gross kW	10,181	1,572	42	11,795
Net-to-Gross Ratio (1-Free Rider %)	0.67	0.75	0.70	
Total PY3 Net kW Savings	**6,821**	**1,179**	**29**	**8,029**

Finally, Table E-5 below compares key gross and net savings impact parameters across the 3 years of this program cycle.

Table E-5. Comparison of Key Impact Parameters Across Program Years

Key Impact Parameter	Refrig	Frz	RAC	Refrig	Frz	RAC	Refrig	Frz	RAC
	Program Year 1			**Program Year 2**			**Program Year 3**		
Units Collected	8,438	3,076	465	20,065	4,946	724	33,937	6,046	1,041
Gross kWh savings per unit @ full load op hours	1,893	2,027	---	2,021	1,928	---	1,855	1,912	---
Part-Use Factor	75%	59%	---	87%	89%	---	90%	75%	---
Total Program Gross MWh	11,982	3,678	37	35,248	8,482	58	56,804	8,705	83
Net-to-Gross Ratio (1-Free Rider %)	0.70	0.83	1.00	0.73	0.82	0.72	0.67	0.75	0.70
Net realization rate	135%			125%			136%		

The starting PY3 net energy savings goal for this program was 30,900 MWh, which represents a steep 31% increase over the final PY2 goal of 23,628 MWh. The program-reported energy savings was 33,093 MWh. The verified energy savings is actually significantly higher than this – 44,851 MWh, for an overall realization rate of 136%. For PY3, the kW saved by the program are again based on ComEd's ex-ante planning estimates for per-unit kW savings for Refrigerators, Freezers and Room AC units. (After the metering study, currently underway, has been completed, kW savings estimates will be developed based on the primary data collected, rather than using planning estimates.)

A comparison of program verified versus program-ex-ante savings is provided in Table E-6 below. The program ex-ante savings estimate was provided by ComEd.

Gross savings per unit (without adjustment for the part-use factor) are very close for the ex-ante and ex-post program-verified savings estimates, since ComEd used virtually the same approach to calculate ex-ante gross savings per unit as was used in this evaluation. Key differences are with respect to the part-use factor and net-to-gross ratio assumptions. Program verified part-use factors were 90% for refrigerators, and 75% for freezers, while the ex-ante assumption was 75% for refrigerators and 65% for freezers. The net-to-gross ratio for the ex-ante estimates was somewhat higher than ex-post for refrigerators (0.70 ex-ante vs. 0.67 for ex-post), identical for freezers, and higher for room ACs (1.00 for ex-ante vs. 0.70 for ex-post). These higher program-verified values yield a total ex-post net savings estimate of 44,851 MWh compared with ex-ante net savings of 33,093 MWh, for a total verified net realization rate of 1.36.

Table E-6. PY3 Program Tracking System Savings Versus Evaluation-Verified Savings (MWh)

Gross and Net Impact Parameter and Savings Estimates	Program Tracking System Savings				Verified Program Savings			
	Refrigerators	Freezers	Room AC	Total Program	Refrigerators	Freezers	Room AC	Total Program
Total units recycled through the Program	33,937	6,046	1,041	41,024	33,937	6,046	1,041	41,024
Annual kWh Savings Impacts								
Annual Gross kWh savings (full-load operating hours)	52,355	11,439	41.48	63,835	56,804	8,705	83	65,592
Part-Use Factor/Realization Rate	75%	65%	100%	73%	90%	75%	--	---
Net-to-Gross Ratio (1-Free Rider %)	0.70	0.75	1.00	0.71	0.67	0.75	0.70	0.68
Total PY3 Net MWh Savings	**N/A**	**N/A**	**N/A**	**33,093**	**38,264**	**6,529**	**58**	**44,851**

E.4 Key Process Findings and Recommendations

According to data from ComEd[1], the program achieved its goal in terms of the number of units recycled through the program, but fell short of meeting its energy savings goals in PY3. Program goals, however, had been sharply increased in PY3. In order to meet these increased goals, ComEd enrolled two new retailers into its program, Sears and Best Buy (in addition to Abt Electronics, a local appliance retailer, which has been participating since PY1), and used a combination of higher incentives and 'specials' to promote the program. ComEd increased the program incentive amount in PY3, from $25 per unit at the beginning of the program to $35 in November of 2010. In addition, ComEd partnered with the ARRA-Illinois Energy Star Rebates program as it did in PY2.

Beyond retail partnerships, program marketing did not change substantially in PY3. The program distributes monthly bill inserts, changing the design and messaging each month. The program sometimes advertises through Valpak, a coupon mailing service. The program added an online keyword search campaign to its PY3 marketing activities. The program also participated in radio advertising and a refrigerator PR event in Chicago in PY3 to raise awareness of the program.

Participant Satisfaction. Overall satisfaction among participants was quite high again this year, with 98% of participants indicating they are satisfied with the program (as shown by satisfaction ratings ranging from 7 to 10 on a 0-10 scale, where 0 is very dissatisfied and 10 is very satisfied). With regard to the $25 (pre-November 1, 2010) or $35 (post-November 1, 2010) incentive amount, 88% are satisfied with it.

The increase in incentive level to $35 per refrigerator or freezer this year, up from $25, appears to have had an effect on why customers chose to participate in the program. Overall, 39 percent of respondents this year (up from 32 percent in PY2) indicated that the rebate was the main reason they chose to participate in the program. The convenience of the home pick up, while still one of the top mentioned reasons for participating, declined from 43 percent of respondents last year to 27 percent this year (likely due to the increase in customers who indicated the $35 incentive was their primary reason for participating). Rounding out the top reasons for participation was the environmental benefits of the program, indicated by 18 percent of respondents (up from 13 percent last year).

[1] Data provided by ComEd on September 8, 2010.

E.5 Summary

Key Impact Findings

The PY3 net energy savings goal for this program was 30,900 MWh and the program-reported energy savings was slightly more than this, 33,093 MWh[2]. The verified energy savings is somewhat higher than this – 44,851 MWh, for an overall realization rate of 136%.

Gross savings per unit (without adjustment for the part-use factor) are very close for the ex-ante and ex-post program-verified savings estimates, since ComEd used virtually the same approach to calculate ex-ante gross savings per unit as was used in this evaluation. Key differences are with respect to the part-use factor and net-to-gross ratio assumptions. Program verified part-use factors were 90% for refrigerators, and 75% for freezers, while the ex-ante assumption was 75% for refrigerators and 65% for freezers. The net-to-gross ratio for the ex-ante estimates was somewhat higher than ex-post for refrigerators (0.70 ex-ante vs. 0.67 for ex-post), identical for freezers, and higher for room ACs (1.00 for ex-ante vs. 0.70 for ex-post). The higher program verified values for the part-use factors yield the higher total ex-post net savings quantities.

Because of inadequate tracking data and the fact that room AC units contribute a very small proportion of the program savings (0.1%), it was not possible to fully evaluate room AC savings. Program-claimed gross savings for room ACs are accepted as verified. The evaluation-verified net-to-gross ratio of 0.70 was then applied.

Key Process Findings

In order to meet aggressive PY3 goals, ComEd enrolled two new retailers into its program in PY3, Sears and Best Buy (in addition to Abt Electronics, a local appliance retailer, which has been participating since PY1), and used a combination of higher incentives and 'specials' to promote the program. ComEd increased the program incentive amount in PY3, from $25 per unit at the beginning of the program to $35 in November of 2010. In addition, ComEd continued to partner with the ARRA-Illinois Energy Star Rebates program as it did in PY2. Finally, ComEd pursued an additional marketing strategy to further publicize the program that involved sending marketing collateral to approximately 200 retailers.

Customer survey results and retail partner interviews suggest that these program changes were both well planned and well executed. Overall satisfaction among participants was quite high again this year, with 98% of participants indicating they are satisfied with the program (as shown by satisfaction ratings ranging from 7 to 10 on a 0-10 scale, where 0 is very dissatisfied

[2] As reported in *PY3 Ex Ante & Plan Summary.xls* provided by ComEd.

and 10 is very satisfied). Customers indicate that their satisfaction is driven by the cash incentive as well as the convenience of the pickup service and overall ease of participation, with 97% saying they would recommend the program to a friend or colleague.

The three appliance retailers currently partnering with the program implementer are highly satisfied with program processes, program communication, and training. In particular, all three partners indicate that hands-on training (including webinars) and frequent store visits from the program implementer are useful and very effective in training staff. Additionally, these retailers suggest that frequent communications (weekly or as needed) between the program implementer and corporate contacts keeps stores well-informed or program information and changes.

All in all, the challenge for the program moving forward would appear to be a very welcomed one—maintain the high levels of customer and participating retailer service that was provided in PY3.

E.6 Cost-Effectiveness Summary

ComEd uses DSMore™ software for the calculation of the Illinois TRC test[3]. Table 3-18 summarizes the unique inputs used in the DSMore model to assess the TRC ratio for the Appliance Recycling program in PY3. Most of the unique inputs come directly from the evaluation results presented previously in this report. Measure life estimates and program costs come directly from ComEd. All other inputs to the model, such as avoided costs, come from ComEd and are the same for this program and all programs in the ComEd portfolio.

Table E-7. Inputs to DSMore Model for Appliance Recycling Program

Item	Value Used
Measure Life	8
Utility Administration and Implementation Costs	$5,134,644
Utility Incentive Costs	$1,075,315
Net Participant Costs	$0

Based on these inputs, the Illinois societal TRC for this program is 3.53 and the program passes the Illinois TRC test.

[3] Demand Side Management Option Risk Evaluator (DSMore) software is developed by Integral Analytics.

Section 1. Introduction to the Program

1.1 Program Description

The Residential Appliance Recycling program was designed to achieve energy savings through the retirement and recycling of older, inefficient refrigerators, freezers, and room air conditioners. The primary objectives of the program are to:

- Decrease the retention of high energy-use refrigerators and freezers; and
- Deliver long-term energy savings.

A secondary objective is to dispose of these older refrigerators and freezers in an environmentally safe manner by offering comprehensive toxic material recycling and disposal that conforms with applicable environmental laws and regulations and permitting requirements.

The program's primary focus is on resource acquisition, that is, cost-effective energy savings. It is **not** seeking to transform the market for recycling older appliances; for example, by developing the private sector's capability to provide recycling as a paid-for service.

The table below shows the energy saving goals of the program in PY3 as provided by the Program Manager.

Table 1-1. ComEd Residential Appliance Recycling Program PY3 Goals

Goals	Net MWh Goal	Associated Units[1]
PY3	30,900	38,483
Estimated Achieved PY3[2]	33,093	41,024

Source: ComEd Program Staff

[1]*Unit Goals shift as the year goes on because refrigerators, freezers, and AC units all provide different kWh savings.*

[2]*ComEd Program Staff provided their ex ante savings estimate. The Associate Units of appliances were indeed the total number of units collected.*

The Residential Appliance Recycling program began operation in June 2008. Program Year 3 (PY3) began on June 1, 2010 and ended on May 31, 2011. The program offers free pickup and recycling services for older, working refrigerators and freezers, and room air conditioners that households no longer want. Program savings are based on the accelerated removal, dismantling and recycling of these older, inefficient units.

The program is marketed through a combination of methods – bill inserts, radio ads, newspaper and newsletter advertisements, online marketing, and word-of-mouth. ComEd also used a direct mail campaign to customers from specific demographic groups who had participated in the past and were seen as likely to participate in the future.

JACO continued to implement the Appliance Recycling Program in PY3. JACO is responsible for the following functions: appliance pickups and related scheduling; processing program enrollments; deconstructing and recycling program units; responding to customer questions and complaints; and program tracking and reporting.

1.1.1 Measures and Incentives

In exchange for participating in the program, ComEd pays participants $35 each for up to two recycled refrigerators or freezers per scheduled pickup. Operational room air conditioner (AC) units are also eligible for pick up and recycling, but they can only be picked up from sites where the recycler, JACO, is already collecting a refrigerator and/or freezer. Participants contributing these working room AC units also receive the $35 program rebate.

1.2 Evaluation Questions

The evaluation sought to answer the following key researchable questions:

Impact Questions

1. What are the gross impacts from this program?
2. What are the net impacts from this program? What is the level of free ridership with this program? What is the level of participant spillover? How can free ridership be reduced?
3. Did the program meet its energy and demand goals? If not, why not?

Process Questions

1. Has the program as implemented changed from that in PY1? If so, how, why, and was this an advantageous change?
2. What are key barriers to participation in the program for eligible ComEd customers? How can they be addressed by the program?
3. How do customers become aware of the program? What marketing strategies could be used to boost program awareness?
4. Is the program outreach to customers and program partners effective in increasing awareness of the program opportunities?

a. What is the format of the outreach?

b. How often does the outreach occur?

c. Are the messages within the outreach clear and actionable?

5. How well are retail partnerships working? Are retail partner training, customer marketing and customer sign-up working well? How can the retail partnership program be improved?

6. Are program incentive levels appropriate to encourage participation?

    a. What is the influence of the incentive level versus the marketing effort on program participation levels?

    b. How should the budget allocation between incentive spending and marketing spending be adjusted to maximize participation?

Section 2. Evaluation Methods

This section describes the analytic methods and data collection activities implemented as part of the PY3 process and impact evaluation of the Appliance Recycling program, including the data sources and sample designs used as a basis for the data collection activities.

2.1 Analytical Methods

2.1.1 Impact Evaluation Methods

Ex-Post Gross Program Savings

Refrigerators and Freezers. Ex-post gross energy savings are expressed in terms of Full-year Unit Energy Consumption (UECs). UEC estimates were made using a regression-based approach that models full-year energy savings as a function of unit age, size, configuration, and defrost mode. These regression equations are based on a large body of impact evaluation work that has already been completed in California, which rely on DOE lab metered results for over 2,000 units. The regression equations were applied to the characteristics of the population of units actually collected by JACO. In addition, gross savings estimates were adjusted for part-use, by applying findings from the telephone survey of program participants.

The regression equation that was used to estimate gross unit savings for recycled refrigerators and freezers is shown below in Table 2-1. This equation is from the evaluation of California's 2004-05 Appliance Recycling program[4], and is based on a large database of over 1,600 previously metered units in California based on the DOE lab metering approach. The regression equation estimates usage as a function of unit characteristics (age, size, configuration, and defrost mode). All of the required data inputs to this equation were obtained from the program tracking data.

[4] Although the evaluation of California's 2006-2008 Appliance Recycling program has recently been completed, the methodology for calculating impacts has been revised to be based on a relatively small database of *in situ* metered data. In addition, the regression equations based on lab-metering results were also updated. Concerns have been expressed about the validity of the new methodology and results of this evaluation, for this reason, the results have not been incorporated into this report.

Table 2-1. Regression Relating DOE Test Annual UEC for Recycled Appliances to Explanatory Variables

Independent Variables	Coefficient	t-Value
Intercept	-422.4106	-0.77
Freezer dummy (=1 if freezer)	169.0536	1.84
Bottom freezer dummy (=1 if unit is bottom freezer)	595.3794	2.91
Side by side dummy (= 1 if unit is side-by-side)	-129.3553	-0.34
Single door dummy (= 1 if unit is single door)	-417.1026	-4.73
Frost free dummy (= 1 if unit is frost free)	-445.0348	-1.00
Natural log of unit age	405.2134	2.15
Cubic Feet of unit (per tracking system data)	43.6478	4.59
Label Amps	104.1018	4.83
Freezer dummy x frost free dummy	319.1097	1.94
Bottom freezer dummy x frost free dummy	-302.0484	-1.28
Side by side dummy x frost free dummy	1451.3206	3.80
Side-side dummy x amps	-126.4332	-2.88
Frost free dummy x ln(age)	299.8206	2.09
Dummy if unit age is 15 years or greater	1197.8349	2.61
Ln age x age 15 up dummy	-524.9782	-3.08

These coefficients are applied to the characteristics of each of the units collected by the program in a 'bottom up' calculation, and then summed across all the units to yield the full-year Unit Energy Consumption or UEC.

Table 2-2 below lists the average value of each of these variables for the Refrigerators collected by the program in PY3.

Table 2-2. Average Refrigerator Characteristics for DOE Model Independent Variables

Independent Variables	
Freezer dummy (=1 if freezer)	0
Bottom freezer dummy (=1 if unit is bottom freezer)	11%
Side by side dummy (= 1 if unit is side-by-side)	17%
Single door dummy (= 1 if unit is single door)	8%
Frost free dummy (= 1 if unit is frost free)	28%
Average unit age in years	24.08
Natural log of unit age	3.07
Cubic Feet of unit (per tracking system data)	18.48
Label Amps	5.87
Dummy if unit age is 15 years or greater	67%

To compute energy savings for the average refrigerator, the following formula is thus applied using the coefficients from Table 2-1 and the values from Table 3-2:

UEC = intercept + freezer (FZ) dummy + bottom freezer (BF) dummy + side-by-side (SS) dummy

+ single door (SD) dummy + frost free (FF) dummy + ln(age) + size (cu.ft) + label amps

+ FZ*FF	+ BF*FF	+ SS*FF	+ SS*Amps
+ FF*ln(age)	+ Ln(age>15) dummy	+ Ln age x age 15 up	

These regression values should continue to be used by ComEd to estimate and track ex-ante savings going forward into Program Year 4 until otherwise instructed.

Part-Use Adjustment. This full-year UEC value was then adjusted for part-use, based on self-reported findings from the completed telephone surveys. This adjustment pro-rates the full-year value for the proportion of the year that the unit would have been operated in the program's absence. The value of this adjustment was calculated directly from phone survey responses regarding the number of months during the year that the participant indicated the appliance would have been operated if the program had not picked it up. Average part-use factors were calculated across all respondents, separately for refrigerators and freezers.

Room Air Conditioners. The deemed savings review document (included in Section 6. Appendices) called for the energy consumption of residential room AC units to be estimated using the following equation:

kWh = unit capacity x load x FLEH / (efficiency x 1000)

where

unit capacity [BTU/h] is a nameplate value

load [dimensionless] is assumed to be 1.0 with partial loading accounted for in FLEH

FLEH (full-load equivalent hours) [hours] is basically the compressor run-time if we assume window AC units are generally a two-state device – on or off.

Efficiency [Btu out / Watts in] or Energy Efficiency Rating (EER) for equipment of this type

1000 is the conversion factor from Watts to kW

Ex-Post Net Savings Analysis

The primary objective of the net savings analysis for the Appliance Recycling program is to determine the program's net effect on customers' electricity usage. This requires estimating what would have happened in the absence of the program. Thus, after gross program impacts adjusted for part-use have been assessed, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio which quantifies the percentage of the gross program impacts that can reliably be attributed to the program. A customer self-report method, based on data gathered during participant telephone surveys, was used to estimate the NTG ratio for this evaluation. This data was cross-checked against responses from surveys of used appliance haulers who provided anecdotal information regarding the disposal methods for the used appliances they process.

For PY3, the net program impacts were based solely on the estimated level of free-ridership in the program. In this program, free ridership is defined based on the percentage of program participants that would have disposed of their units absent the program in a manner that would have permanently removed the unit from the grid. This includes participants who indicated they would have otherwise:

- Sent the unit to a recycling facility, or
- Taken the unit to a landfill

Participant spillover was not assessed. For this program, because the program approach does not support a theory for how meaningful spillover might occur, and because it does seem unlikely to be significant, we have not estimated spillover.

2.1.2 Process Evaluation Methods

As in PY1 and PY2, the process evaluation consisted of in-depth interviews with the ComEd and JACO Appliance Recycling Program Managers, as well as telephone surveys with a large

sample of program participants. In addition, in-depth interviews were conducted with participating and non-participating retailers, and with two used appliance dealers, to provide a more comprehensive picture of the markets being addressed by the program.

- *Program Staff Interview.* The interview with the Appliance Recycling Program Managers at ComEd focused on changes and updates regarding the goals of the program, the program implementation, the perceived effectiveness of the program, and also verified evaluation priorities. The interviews with the JACO managers focused on the recycling process and the details of the appliance pickup.
- *Retailer Surveys.* The interviews with participating retailers focused on various processes that are unique to retailer participation including customer sign-up employee training, and program marketing. Interviews with non-participating retailers sought information on program awareness and acceptance, and general corporate policies and decision-making strategies regarding appliance recycling practices.
- *Used Appliance Hauler Surveys.* The interviews with used appliance 'haulers' sought to gauge whether owners/managers of these companies are noticing any change(s) to the secondary appliance market, as a result of consumers choosing to participate in ComEd's appliance recycling program. In addition, haulers were asked about their practices for disposing of appliances that they pick up (e.g., do they recycle, discard at land fill, or feed into secondary market, and does this vary by age or condition of the appliance).
- *Telephone Surveys*. The process evaluation component of the participant telephone survey obtained information on sources of program awareness, program satisfaction, rebate satisfaction, and awareness of program features (e.g., rebates, technical assistance, marketing materials).

In the telephone surveys, participants were asked numerous questions about satisfaction using a scale from 0 to 10, with 0 being the most dissatisfied, and 10 being the most satisfied. For the data analysis, the evaluation team grouped the responses into the following groups: 0 to 3 responses are classified as dissatisfied, 4 to 6 are classified as neutral, and 7 to 10 are classified as satisfied.

2.2 *Data Sources*

Table 2-3 below summarizes the key data collection activities in support of this evaluation.

Table 2-3. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
Tracking Data Analysis	All Program Participants	Tracking Database	-	All	Ongoing
In-depth Phone Interviews	ComEd program manager	Contact from ComEd	Current and former AR PMs	2	March 29, 2011
	Implementation Contractor	Contact from ComEd	IC Retail Program Manager	2	April 8, 2011 and May 5, 2011
	Participating Retailers	Contacts from Program Implementer	Representatives from all three participating retailers	4 total – two from 1 retailer	July 1, 8 and 15, 2011
	Non-participating retailers	Internet Search – Any retailers other than the three participating retailers	Representatives from non-participating retailers	4	July 29, August 1-3
	Used Appliance Disposal and Hauling Services	Internet Search	Representatives from local haulers	2	August 3-4
CATI Phone Surveys	Program Participants	Tracking Database	Stratified Random Sample of AR Program Participants	202 Total – 151 Refrig., 51 Freezer, 30 Room AC Recyclers	August 2011

Note that the number of appliances represented exceeds the number of completed surveys. This is because some respondents interviewed had 2 or more measures.

Below is a summary of how each of these data sources was used in the specific components of the evaluation study.

- Impact Evaluation
    - *Estimation of gross savings/UECs.* All of the required data inputs to the regression equation used to develop final estimates of gross unit energy consumption for refrigerators and freezers were obtained from the program tracking database. The telephone survey also obtained several of these same characteristics. However, because they were based on self-reported information, rather than the results of a visual inspection of the units picked up by the program, they were deemed less reliable than the tracking data which was ultimately used for the calculation.
    - *Estimation of the Part-use factor and Net-to-gross ratio.* Self-reported findings from the telephone survey of program participants was the primary data source for both the part-use factor and the net-to-gross ratio. For the Net-to-Gross ratio, the primary data source was the Participant survey, while it was planned that the Hauler survey findings could be used to validate the self-reported findings from the Participant survey. Because of the small sample size and the fact that those interviewed were in the business of removing appliances that were largely not working, the findings are too limited to inform the program net-to-gross ratio.
- Process Evaluation

  The process evaluation relied primarily on four data sources: program staff interviews, a telephone survey of program participants, interviews with participating and nonparticipating retailers, and used appliance hauler surveys.
    - *Program Staff Interviews.* The interview with the Appliance Recycling Program Managers at ComEd focused on changes and updates regarding the goals of the program, the program implementation, the perceived effectiveness of the program, and also verified evaluation priorities. The interviews with the JACO managers focused on the recycling process and the details of the appliance pickup.
    - *Retailer Surveys.* The interviews with participating retailers focused on various processes that are unique to retailer participation including customer sign-up, employee training, and program marketing. Interviews with non-participating retailers sought information on program awareness and acceptance, and general corporate policies and decision-making strategies regarding appliance recycling practices.
    - *Used Appliance Hauler Surveys.* The interviews with used appliance 'haulers' sought to gauge whether owners/managers of these companies are noticing any change(s) to the secondary appliance market, as a result of consumers choosing

to participate in ComEd's appliance recycling program. In addition, haulers were asked about their practices for disposing of appliances that they pick up (e.g., do they recycle, discard at land fill, or feed into secondary market, and does this vary by age or condition of the appliance).

- *Participating Customer Surveys*. The process evaluation component of the participant telephone survey obtained information on sources of program awareness, program satisfaction, rebate satisfaction, and awareness of program features (e.g., rebates, technical assistance, marketing materials).

2.3 Sampling Plan

Participant survey. The sample of Appliance Recycling participants was randomly selected from the Program Tracking Database provided by ComEd. Basic data cleaning steps were undertaken before the sample was pulled from the database so that for example, records with missing or invalid phone numbers were removed. A total of 1,036 participants who recycled more than one of the same type of major appliance were dropped from the survey effort for ease of survey administration. (To avoid survey fatigue, participants were only asked about one major appliance so respondents could more easily focus on a single appliance in their responses.) In addition, 1,336 participants were dropped because of duplicate or missing phone numbers or because the tracking database indicated they were a business. These records could not be included in the surveying efforts but were included in the final impact results. The final participant population from which the survey sample was drawn was 35,735 participants.

The sample was stratified by appliance type and quotas were set based on the proportion of each appliance in the general population. Each participant was assigned to one of six strata based on the type of unit or units recycled: Primary Refrigerator, Secondary Refrigerator, Primary Refrigerator and AC Unit, Secondary Refrigerator and AC unit, Freezer, and Freezer and AC Unit.[5] Quotas were then set for each stratum. The Freezer strata were oversampled to ensure sufficient data would be available to support the impact and process analysis. Because of the oversampling, weights were then constructed for each stratum that reflect that stratum's share of the Appliance Recycling program population.

Opinion Dynamics Corporation (ODC) was then instructed to randomly select and dial participants until they had reached the following quotas – 150 Refrigerator Recyclers, 40 Freezer Recyclers, and 10 Room AC Recyclers, for a total of 200 completed surveys. Ultimately, 202 surveys were completed. Table 2-4 shows the population sizes and number of completed surveys for each of the six strata.

[5] Participants who recycled both a refrigerator and a freezer were randomly assigned a major appliance for the survey to limit survey fatigue.

Table 2-4. PY3 Participant Survey Population and Sample Sizes by Stratum

Strata (Types of Units Recycled)	Population Size* (N)	Completed Surveys (n)
Primary Refrigerator	7,202	30
Secondary Refrigerator	24,081	99
Primary Refrigerator and AC Unit	344	4
Secondary Refrigerator and AC unit	514	11
Freezer	4,967	43
Freezer and AC Unit	143	9
Refrigerator, Freezer and AC Unit	29	0
AC Unit	7	6**
Total	38,107	202

**Source: PY3 Appliance Recycling Participant Survey Sample Frame from Program Tracking Database*

***It was not part of the sample design to get AC only participants. All of these participants had a tracking database entry that showed either a refrigerator or a freezer recycled through the program. However, when we surveyed these participants about their recycled measures they stated that they only recycled AC units.*

2.4 *Sampling Error*

Table 2-5 gives population sizes, completed interviews and the associated confidence intervals for each appliance type.

Table 2-5. PY3 Participant Survey Population, Sample Sizes and Sampling Error by Appliance Type

Strata	Population Size* (N)	Completed Surveys (n)	Sampling Error (90% CI)
Recycled Refrigerators	33,937	114	7.92%
Recycled Freezers	6,046	38	12.18%
Totals	39,983	152	6.77%

**Source: PY3 Appliance Recycling Participant Survey Sample Frame from Program Tracking Database*

[2]*This column sums to more than 200 completed surveys to meet unit type quotas and because some respondents recycled more than one appliance type. All completed surveys are included in the analysis of each subgroup.*

2.4.1 Survey Disposition

Table 2-6 shows the final dispositions for the 1,369 program participants we attempted to contact for this evaluation. As the table shows, we completed interviews with 202 participants, or 15%. We were unable to reach 42% for a variety of reasons such as no one answering, an answering machine, or a busy signal. Another 10% requested to be called back later to complete the survey but did not end up doing so.[6] There were problems with the phone number, such as a disconnected number, for 9%. Finally 16% of participants who answered refused to participate in the survey.

Table 2-6. Participant Survey Sample Disposition

Sample Disposition	Customers	%
Participants Attempted to Contact	1,369	100%
Completes	202	14.8%
Appliance not picked up	34	2.5%
Electric company not ComEd	7	0.5%
Refusal	220	16.1%
Unable to Reach	580	42.4%
Language Barrier	11	0.8%
Phone Number Issue	117	8.5%
Non-Specific Callback/Appointment Scheduled	132	9.6%
Mid Interview Terminate	66	4.6%

Source: PY3 Appliance Recycling Participant Survey

As outlined in Table 2-7, interviews were attempted with 1,369 participants and completed with 202 participants. The remaining 1,167 did not complete full surveys for several reasons including participants terminated mid-interview (n=66), the participant claimed they signed up for the program but the appliance was never picked up (n=34), or ComEd was not their electric utility (n=7). For these latter two categories, we cannot say if the participant database included some people in error or if these respondents had recall problems.

[6] Often, participants who are not inclined to participate do not outright refuse. Instead they agree to be called back, but when called back, the time is once again inconvenient. These participants are typically called a number of times, but many never complete a survey so that their final disposition is "call back".

Table 2-7. Participant Survey Contacts Disposition

Survey Contacts Disposition	Customers	%
Customers Surveyed		
Completed Interview	202	65.4%
Appliance not picked up	34	11.0%
Electric company not ComEd	7	2.3%
Mid-Interview Terminate	66	21.4%

Source: PY3 Appliance Recycling Participant Survey

Section 3. Program Level Results

This section presents the results of the impact and process evaluations of the Appliance Recycling program.

3.1 Impact Evaluation Results

3.1.1 Verification and Due Diligence

Given modest changes in the program design, this topic was not revisited. Participant survey results continue to indicate that the program tracking database correctly records units recycled as indicated by a verification rate of 100% to the question, "our records show that you had (appliance description) picked up by ComEd's subcontractor JACO, is that correct?". Therefore the number of units by appliance type as derived from ComEd's tracking data, and shown below in Table 3-1 are valid.

Refer to the year 1 report for more information.

3.1.2 Tracking System Review

The Appliance Recycling tracking data for PY3 contained 41,024 records, one for each appliance that was picked up and recycled. This is consistent with the claimed savings estimate which was also based on this same total of recycled appliances.

Distribution by Appliance Type

About 83% of these units were refrigerators, another 15% were freezers, and the remaining 2% were room air conditioners. Table 3-1 below provides the breakdown of recycled units by measure type.

Table 3-1. Summary of Recycled Units by Appliance Type

Measure Type	Number of Units	Percent of Units
Refrigerators	33,941	83%
Freezers	6,046	15%
Room Air Conditioners	1,037	2%
Total Units Recycled	41,024	100%

Table 3-2 below provides a further breakdown of the population stratified by appliance type, of the number of appliances turned in as reported by the tracking data.

Table 3-2. Appliance Recycling Program: Appliance Type Versus Number Turned In

Refrigerators	Freezers	Room AC Units	Number of Applications	Number of Participants
		1	1	7
	1		1	4,882
1			1	30,405
	2		2	85
2			2	878
1		1	2	791
1	1		2	817
	1	1	2	141
1	1	1	3	28
	2	1	3	2
2		1	3	67
2	1		3	2
2	1	1	4	1
3	1		4	1

From these data, we observe the following patterns in terms of the distribution and count by appliance type:

- There are 38,107 unique participants, and most recycled one unit (30,405 refrigerators, 4,882 freezers, 7 room ACs).
- A total of 914 participants (2.2%) recycled 2 major units (defined as a refrigerator and/or freezer), and of these, about 10.4% also recycled a room AC unit.
- Another 5 participants recycled 3 or more major units.
- For room ACs, the majority of participants had AC units that were picked up at the same time as a refrigerator or freezer, in accordance with program procedures.

In terms of anomalies, we found one type, which did not result in any adjustment to the tracking data:

- There were 7 participants who recycled only a room AC, ComEd does not pay pick-up costs in these cases.

Problems Found

As in past evaluations, our review of the tracking data provided to the evaluation team also uncovered some problems, most notably that there were:

- Incomplete records for several tracked fields. Most fields were well-populated, and particularly the most important fields for evaluation (appliance brand, model number, size, age/year manufactured, defrost type, location at the time of pick up). Also, we commend ComEd and JACO for improving the completeness of the Room AC data fields in PY3.
- However, some of the tracked fields continued to be sparsely populated in PY3, or the entry was designated 'unknown' or 'N/A'. These included:
- **Prior Location of Recycled Unit.** A substantial number of records had 'other' or 'unknown'. Possibly these are default values in the database, but they are not useful for evaluation purposes. JACO should gather this information during the scheduling call, if at all possible.
- **Is Unit Replaced.** This, potentially, is an important field for evaluation, however, in all cases, it is populated with 'unknown'. Again, this should be gathered by JACO during the scheduling call.
- **Prior Unit Usage, Season When Used.** These fields are never populated and should be dropped from the database. They are not used by the program or by evaluation.

Although we were able to complete the evaluation without these incomplete data, it would be better if they could be more fully populated in the future. We will document our concerns in a memo to ComEd and JACO and will work closely with JACO over the next few months to ensure these fields are correct, and are being populated. Data exported for the evaluation team should also be checked for anomalies.

3.1.3 Gross Program Impact Parameter Estimates

Refrigerators and Freezers

Annualized Unit Energy Consumption (UEC)

As detailed in Section 1, regression based Unit Energy Consumption (UEC) estimates were made for both refrigerators and freezers. The regression equation estimates usage as a function of unit characteristics (age, size, configuration, and defrost mode). All of the required data inputs to this equation were obtained from the program tracking data.

Applying the regression coefficients to the full population of units collected through the program during PY3 and their associated characteristics yielded the following UECs for each type of appliance (Table 3-3).

Table 3-3. Estimated UECs

Annualized UECs	Refrigerators	Freezers
kWh	1,855	1,912

Both age (in years) and size (in cubic feet) are key explanatory variables that drive these estimates. In general, the older a unit is, the larger it is and the more electricity it uses. This is the case for 2 reasons:

1. Because of a change in standards in 1993, units built since that time are much more energy efficient and generally smaller than units made prior to the standards change.

2. There is degradation of a unit's efficiency over time, as the unit ages.

Because this is a relatively new program, the appliances collected during PY3 have been primarily older and larger units than those collected via a more established program (as in California). Table 3-4 and Table 3-5 below provide the age and size characteristics of the units collected in PY3 through ComEd's program.

Table 3-4. Age Characteristics of Recycled Appliances

Appliance Type	Age in Years									
	0 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	Over 40	Average
Refrigerators	1%	8%	12%	18%	22%	17%	11%	4%	7%	24
Freezers	0%	2%	5%	9%	20%	21%	19%	9%	14%	26
Room Air Conditioners	1%	1%	8%	14%	25%	19%	12%	7%	12%	23

Table 3-5. Size Characteristics of Recycled Appliances

Appliance Type	10 cubic feet and smaller	11 to 15 cubic feet	16 to 20 cubic feet	21 cubic feet and larger	Average
Refrigerators	4%	20%	43%	34%	18
Freezers	11%	40%	40%	9%	15

From these data, the following observations can be made:

- Age
- Fully 61% of refrigerators, 84% of freezers, and 76% of room AC units are over 20 years old
- Approximately 40% of refrigerators and freezers are between 21 and 30 years old
- One-fifth of refrigerators (22%) and 42% of freezers are over 30 years old
- The following percentages of appliances collected by the program were made before the 1993 standards change: 61% of refrigerators and 84% of freezers
- Note that it is a program requirement for all appliances picked up to be in working condition (even those over 30-40 years old). The truck driver tests the unit to ensure this is the case at the time of pick up.
- Size
- The majority of units collected are 16 cubic feet and larger, one third of refrigerators are larger than 20 cubic feet
- Recycled refrigerators tend to be larger on average than recycled freezers
- The size distribution of freezers collected by the program is more diverse than refrigerators. The most common freezer sizes are between 11 and 20 cubic feet, while those for refrigerators range from 16 cubic feet to over 20 cubic feet.

Since the age of recycled units is a major driver of unit energy consumption, we also looked at the trend in the age distribution of units collected through the program from PY1 to PY3. Table 3-6 provides a comparison of the age distribution of recycled refrigerators, while Table 3-7 has similar information for recycled freezers.

Table 3-6. Comparison of Age Distribution of Recycled Refrigerators

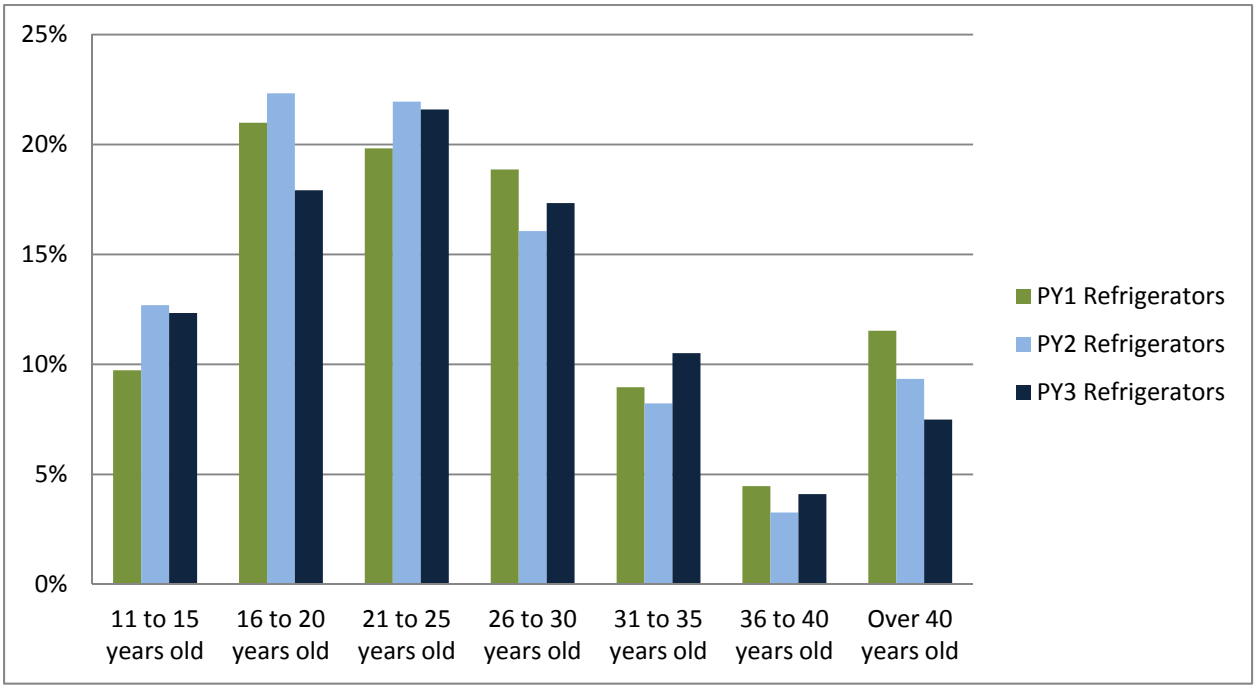
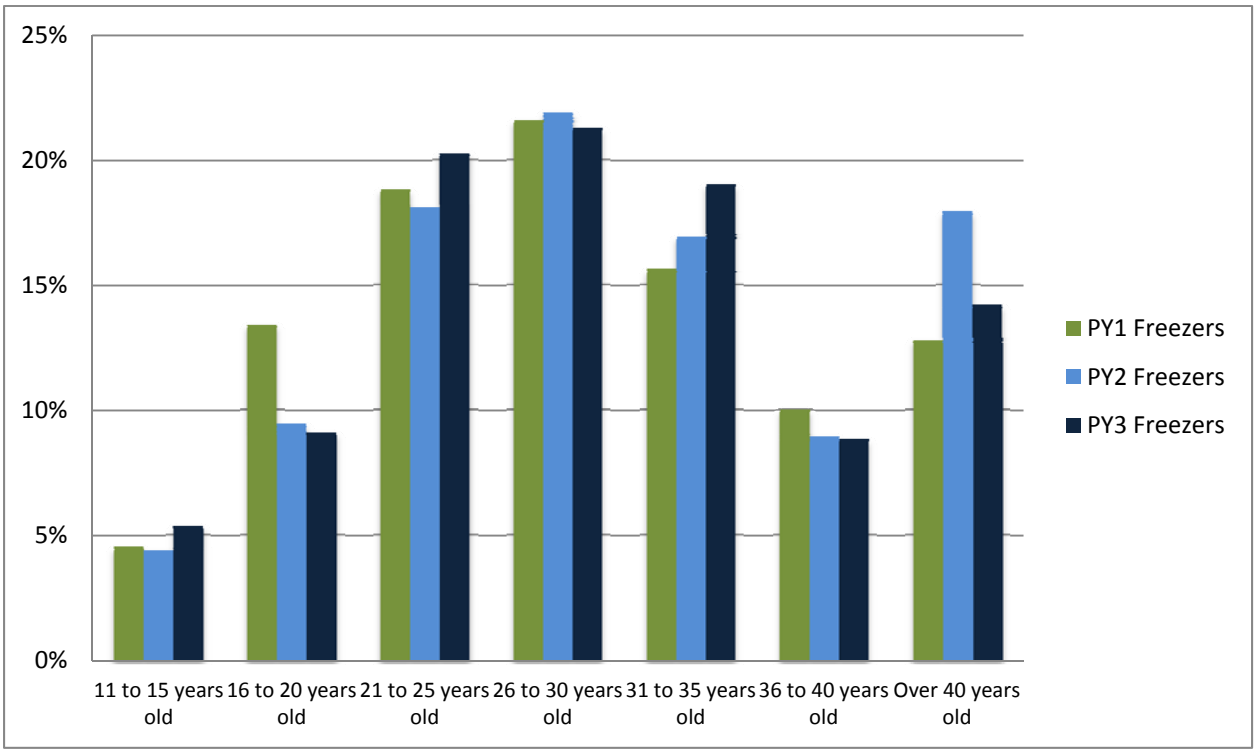


Table 3-7. Comparison of Age Distribution of Recycled Freezers



With respect to refrigerators, the PY3 program has picked up a higher proportion of older units (particularly those over 25 years old) than in PY2, comparable to that in PY1. However, the trend is the opposite for freezers. It may be that there is still a substantial 'inventory' of older units of both measure types available to the program for at least the short-term. However, over the longer term, one would expect the program to be picking up younger units as it matures, thereby decreasing per-unit energy savings.

Part-use factors. The part-use factors account for the fact that a unit that would have stayed in use would have been in use only part of the time. For example, the savings due to removal of a unit that would have been used only three months of the year is only one-quarter (3/12) the savings associated with full-year use (assuming essentially constant use over the year for a full-use unit). The part-use factor is used to adjust gross savings UECs to yield estimates of annualized gross savings that can be attributed to the program. The part-use factors are taken from the results of the telephone survey of participants.

Refrigerators. The assumption is that any refrigerator that would otherwise have been kept in use would have been used as a secondary, not as a primary refrigerator. Therefore, the part-use for all primary refrigerators that would otherwise have been kept is set at the average part-use reported by participants who disposed of a secondary refrigerator. This part-use was the number of months, divided by 12, that the participant reported the unit would have been plugged in and running had the program not picked it up. This average was determined to be 90% or 0.90. The program ex-ante gross impact estimate was based on an assumption that the part-use factor for refrigerators was 75%.

Freezers. For freezers, the average part-use factor is based on a similar question for all participants who disposed of a freezer. This average was determined to be 75% or 0.75. The supplemental data collected in the survey provide no further insight into the part-year usage, nor do the tracking data. The program ex-ante gross impact estimate was based on an assumption that the part-use factor for freezers was 65%.

Table 3-8 below reports the distribution of unit usage by appliance type and frequency of use for both refrigerators and freezers. The predominant response by participants is that they would have used the unit 'always' if the program had not picked it up.

Table 3-8. Frequency of Usage in the Absence of the Program

Appliance Type	Never	1 to 3 months	4 to 6 months	7 to 9 months	10 to 12 months	Always	N
Refrigerators	4%	6%	2%	1%	1%	85%	144
Freezers	17%	2%	4%	6%	0%	71%	52

Gross Savings (UEC) Impacts Adjusted for Part-Use

The next step is to develop gross savings estimates for each type of appliance adjusted for part use. The application of the part-use factor reduces refrigerator savings/unit to 1,674 kWh per year, and freezer savings/unit to 1,440 kWh/year. These estimates are provided in Table 3-9 below.

Table 3-9. Gross Savings (UECs) Adjusted for Part Use

Appliance Type	Gross Savings (UECs)	Part-Use Factor	Adjusted Gross Savings (kWh/unit)
Refrigerators	1,855	90%	1,674
Freezers	1,912	75%	1,440

Room Air Conditioners

The savings contribution of this measure to the program is extremely small – it accounts for only 0.1% of program savings. The deemed savings memo called for the energy consumption of residential room AC units to be estimated using an engineering algorithm. Although more data are included in the tracking database than in PY2, there still is insufficient data to do the calculation. However, since the savings contribution of this measure to the program is extremely small, we have elected to accept ComEd's ex-ante gross savings estimates.

3.1.4 Gross Program Impact Results

Table 3-10 below provides the third-year evaluation-adjusted gross kWh savings estimates for each measure. The resulting verified total program gross savings quantity is 65,592 MWh. This value includes the application of the part-use factor. The ex-ante gross savings claimed by the program is 46,681 MWh[7]. Gross savings per unit (without adjustment for the part-use factor) are very close for the ex-ante and ex-post program-verified savings estimates, since ComEd used substantially the same approach to calculate ex-ante gross savings per unit as was used in this evaluation. Key differences are with respect to the part-use factor. In its ex-ante estimates, ComEd has assumed a part-use factor (labeled as a realization rate in their table) of 0.75 for refrigerators and 0.65 for freezers. The program verified part-use factors are 0.90 for refrigerators and 0.75 for freezers, respectively.

[7] As reported in *PY3 Ex Ante & Plan Summary.xls* provided by ComEd.

Table 3-10. PY3 Gross Impact Parameter and Savings Estimates (MWh)

Gross and Net Impact Parameter and Savings Estimates	Refrigerators	Freezers	Room AC	Total Program
Total units recycled through the Program	33,937	6,046	1,041	41,024
Verified Annual kWh Savings Impacts				
- Verified annual Gross kWh savings per unit (full-load operating hours)	1,855	1,912	---	---
- Part-Use Factor	90%	75%	---	---
- Verified annual Gross kWh savings per unit adjusted for part-use	1,674	1,440	80	---
Verified Program Gross MWh	**56,804**	**8,705**	**83**	**65,592**

Table 3-11 below provides the third-year evaluation-adjusted gross kW savings estimates for each measure. For PY3, the kWs saved by the program are based on ComEd's ex-ante planning estimates for per-unit kW savings for Refrigerators, Freezers and Room AC units.

Table 3-11. PY3 Gross and Net Impact Parameter and Savings Estimates (kW)

Gross and Net Impact Parameter and Savings Estimates	Refrigerators	Freezers	Room AC	Total Program
Total units recycled through the Program	33,937	6,046	1,041	41,024
Verified Annual kW Savings Impacts				
Annual Gross kW savings per unit (full-load operating hours)	0.30	0.26	0.04	---
Verified Program Gross kW	**10,181**	**1,572**	**42**	**11,795**

3.1.5 Net Program Impact Parameter Estimates

Once gross program impacts have been estimated, net program impacts are calculated by multiplying the gross impact estimate by the Program Net-to-Gross (NTG) ratio. The NTG ratio is equal to 1 minus the percentage of free riders plus spillover. For this program because the program approach does not support a theory for how meaningful spillover might occur, and because it does seem unlikely to be significant, we have not estimated spillover.

In this program, free ridership is defined based on the percentage of program participants that would have disposed of their units absent the program in a manner that would have permanently removed the unit from the grid. This includes participants who indicated they would have otherwise:

- Sent the unit to a recycling facility, or
- Taken the unit to a landfill

In total, 47 out of 144 refrigerator respondents (33%), 13 of 52 freezer respondents (25%), and 9 out of 30 room AC respondents (30%) revealed they would have used a method to dispose of their unit that would have permanently destroyed it, indicating they are free riders. Resulting NTG ratios are 0.67 for refrigerators, 0.75 for freezers, and 0.70 for room air conditioners. The refrigerator and freezer NTG ratios declined slightly from 0.73 and 0.82, respectively, in PY2. For its ex-ante planning estimates, ComEd has used values of 0.70 for refrigerators, 0.75 for freezers and 1.00 for room air conditioners.

Interviews with the used appliance haulers did not provide any evidence to counter these findings. The sample size was very small (n=2) and the businesses dealt largely with units that had stopped functioning. However, the haulers indicated their primary disposal methods for these types of units was either deconstruction and recycling or taking anything that cannot be recycled to a landfill.

It is recommended that a full market assessment be conducted in the PY4 evaluation. The objective is to assess the state of both the new and used appliance markets with respect to disposal and recycling of older units. Such an assessment would be comprehensive in nature, relying on facts and interview results from all major players in the market.

3.1.6 Net Program Impact Results

Table 3-12 below provides the program-level evaluation-adjusted net impact results for the PY3 Residential Appliance Recycling program. As this figure shows, the ex post program-level third-year net energy saving estimate resulting from this evaluation is 44,851 MWh, exceeding program claimed estimates by over 11,750 MWh, and resulting in a net realization rate of 136%. The difference between the ex-ante net savings and ex-post net savings is primarily due to differences in the part-use factors applied. Program verified part-use factors were 90% for refrigerators, and 75% for freezers, while the ex-ante assumption was 75% for refrigerators and 65% for freezers. The net-to-gross ratio for the ex-ante estimates was somewhat higher than ex-post for refrigerators (0.70 ex-ante vs. 0.67 for ex-post), identical for freezers, and higher for room ACs (1.00 for ex-ante vs. 0.70 for ex-post).

Table 3-12. PY3 Net Impact Parameter and Savings Estimates

Verified Annual Net MWh Savings Impacts	Refrigerators	Freezers	Room AC	Total Program
Verified Program Gross MWh	56,804	8,705	83	65,592
Net-to-Gross Ratio (1-Free Rider %)	0.67	0.75	0.70	---
Total Third-Year Evaluation-Adjusted Net MWh Savings	**38,264**	**6,529**	**58**	**44,851**
Net MWh Savings Claimed by the Program				33,093
Net MWh Realization Rate				**136%**
Verified Annual Net kW Savings Impacts				
Verified Program Gross kW	10,181	1,572	42	11,795
Net-to-Gross Ratio (1-Free Rider %)	0.67	0.75	0.7	0.68
Total Third-Year Evaluation-Adjusted Net kW Savings	**6,821**	**1,179**	**29**	**8,029**

3.2 *Process Evaluation Results*

The process evaluation component of the Residential Appliance Recycling evaluation focused on appliance usage data and satisfaction with program processes, including sign up, pickup and receipt of the refund check. Key data sources for the process evaluation include the Participant telephone survey, the Nonparticipant telephone survey, and the in-depth interviews with the ComEd Program Manager, the participating and nonparticipating retailers, and the used appliance haulers.

3.2.1 Process Themes

As indicated above, because of the way samples were drawn, participant survey results have been weighted.

Changes to Program

Program unit and savings goals increased in PY3, with unit goals increasing by a larger percentage than savings goals (47% vs. 30%) based on the expectation that the mix of units in the program may continue to shift to slightly newer or more energy efficient units.

In order to meet these increased goals, ComEd enrolled two new retailers into its program, Sears and Best Buy, and is using a combination of higher incentives and 'specials' to promote the program. ComEd increased the program incentive amount in PY3, from $25 per unit at the beginning of the program to $35 in November of 2010. In addition, ComEd partnered with the

ARRA-Illinois Energy Star Rebates program (as it did in PY2), and used an additional marketing strategy that involved sending marketing collateral to approximately 200 retailers to further publicize the program. These activities served only to further publicize the program. Customers learning of the program via these efforts participated in the program in the usual way, contacting JACO and arranging for unit pick up.

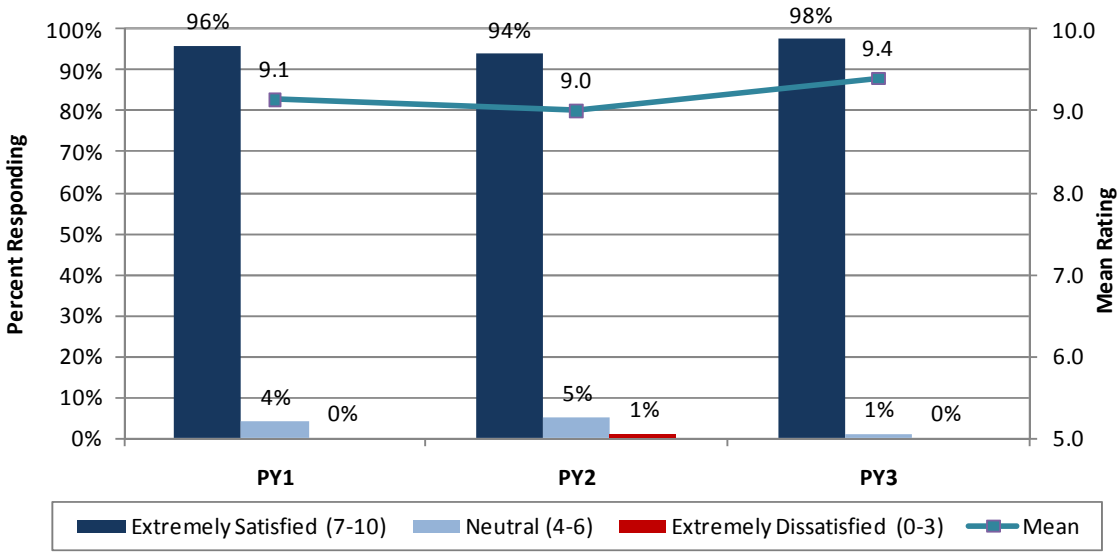
ComEd has partnerships with three appliance retailers. One is a local retailer and the other two are national chain stores. The partnership with the local retailer began in PY1, when they began enrolling customers in the program at its single Illinois location. The partnerships with the two national chain stores began in PY3, and by the end of PY3, more than 80 of their stores in ComEd territory participated in the program. Retail partners are responsible for marketing the program to ComEd customers, verifying customer eligibility, enrolling customers in the program, and removing unwanted appliances from participant homes (usually upon delivery of a new appliance). The program implementer is responsible for providing ongoing training, point-of-sale materials, enrollment software and support, as well as ensuring that program tracking for units enrolled through retail partners is consistent with the standard program.

Beyond retail partnerships, program marketing did not change substantially in PY3. The program distributes monthly bill inserts, changing the design and messaging each month. The program sometimes advertises through Valpak, a coupon mailing service. The program added an online keyword search campaign to its PY3 marketing activities. The program also participated in radio advertising and a refrigerator PR event in Chicago in PY3 to raise awareness of the program.

Overall Program Satisfaction

Table 3-13 below presents findings related to participant satisfaction with the program in general. Overall satisfaction among participants was quite high again this year, with almost 98 percent of respondents indicating they were satisfied with the service they received throughout their entire experience (rating of 7 or higher on a 0-10 scale), representing an average rating of 9.4. This is a slight increase from PY2 when 94 percent of respondents indicated a rating of 7 or higher (with an average rating of 9.0) and PY1 with 96 percent of respondents (average rating of 9.1).

Table 3-13. Overall Satisfaction with the Program



We asked the respondents who had indicated an overall satisfaction rating of five or greater to describe what they particularly liked about the program. Respondents mentioned the convenience of the service and how easy it was to participate, the fact they did not have to dispose of the appliance themselves, and the $35 incentive as reasons for high satisfaction.

When asked how likely they were to recommend the program to a friend or colleague, 97 percent indicated a high likelihood of recommendation (rating of 7 or higher on a 0-10 scale), almost unchanged from 98 percent during PY2.

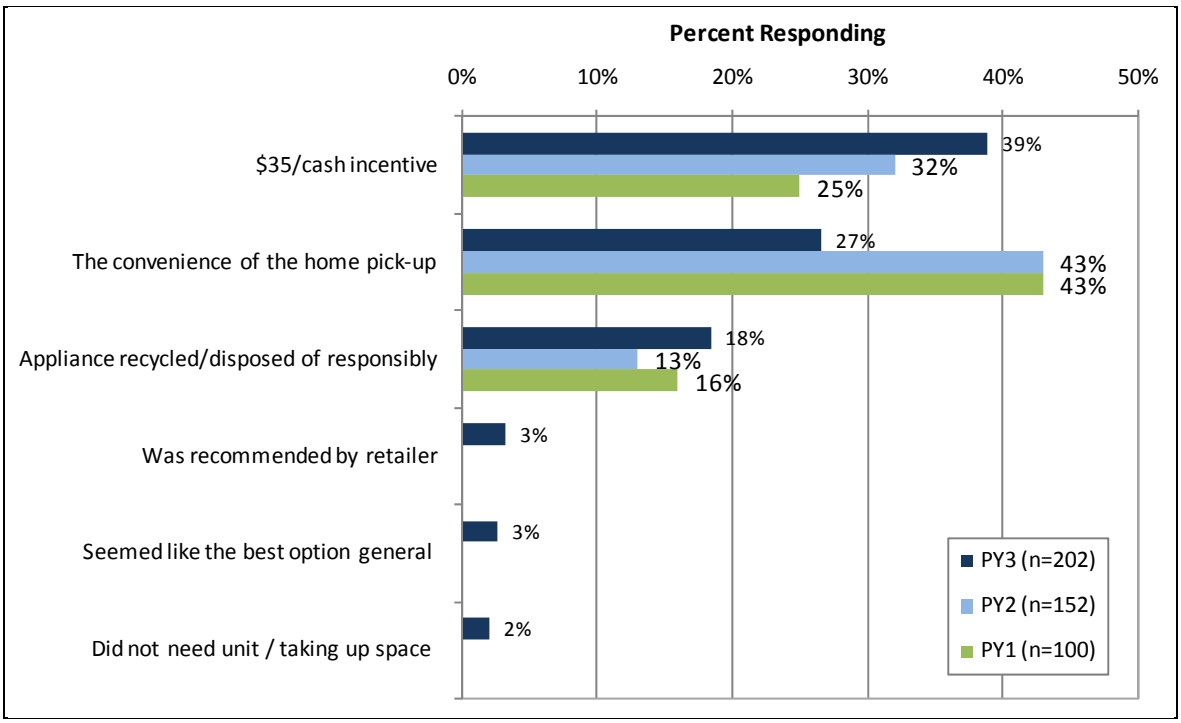
Satisfaction with particular program components was also relatively high, with 88 percent of respondents indicating high satisfaction (rating of 7 or higher) with the size of payment they received and the amount of time it took to receive it. This represents a noticeable increase over satisfaction levels during PY2 where 79 percent of respondents indicated high satisfaction with the size of payment and 72 percent of respondents indicated high satisfaction with the time it took to receive it.

Just over one-third of respondents (36 percent) said they have seen a reduction in their energy bill since their appliance was removed, up from 30 percent last year, and 33 percent in PY1. Respondents who had recycled a freezer through the program indicated a higher likelihood of noticing energy savings (47 percent of respondents who had recycled a freezer vs. 34 percent of refrigerator respondents). However, half of respondents this year had not noticed a change in their electric bill and 13 percent were not sure if they had seen a decrease. The reasons for this are unclear.

Drivers of Participation

The increase in incentive level to $35 per refrigerator or freezer this year, from $25 last year, appears to have had an effect on why customers chose to participate in the program. Overall, 39 percent of respondents this year (up from 32 percent in PY2) indicated that it was the main reason they chose to participate in the program. The convenience of the home pick up, while still one of the top mentioned reasons for participating, declined from 43 percent of respondents last year to 27 percent this year (likely due to the increase in customers who indicated the $35 incentive was their primary reason for participating). Rounding out the top reasons for participation were the environmental benefits, indicated by 18 percent of respondents (up from 13 percent last year). A variety of other reasons for participation (each mentioned by three percent or fewer of participants) are also shown in Table 3-14 below.

Table 3-14. Main Reasons for Participating in the ComEd Program



*Responses mentioned by less than two percent of PY3 respondents are not shown.

Reasons for disposing of the appliance

In a newly added question sequence, participants were asked why they disposed of their appliances through the program. Table 3-15 below summarizes the most important reasons provided.

Table 3-15. Reasons for Disposing of Appliance

Reasons for Disposing Unit	Percent Rating Reason As Important (score of 7 and higher)	
	Refrigerators	Freezers
Unit was a spare that I did not use very much	33%	50%
Unit was old, I wanted something with more modern features	46%	33%
Unit was expensive to run	38%	36%
I wanted a bigger unit	32%	29%

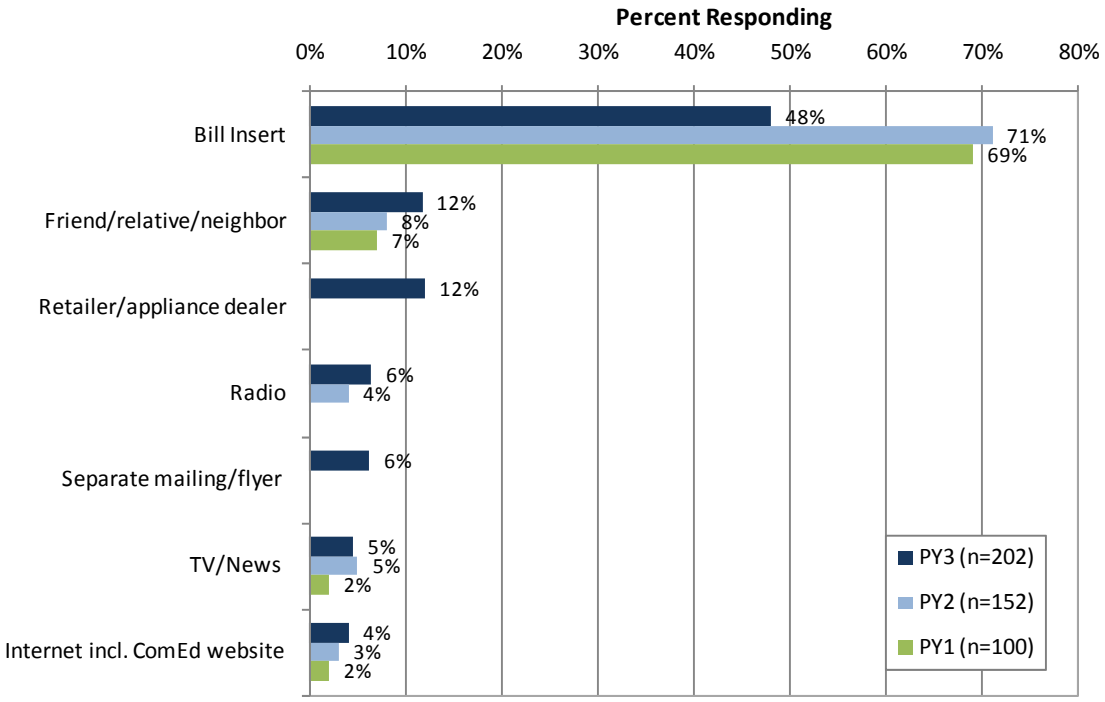
The most important motivation for those with refrigerators was to upgrade their unit to something with more up-to-date features (46% of respondents). In contrast, those with freezers wanted to get rid of the unit because it was not used very often (50% of respondents). The cost to operate the unit was viewed as an important reason for disposal by just over one-third of recyclers of both unit types. This may be an area where further education of ComEd customers is needed, to make them aware of the considerable expense associated with running these older units.

Marketing and Promotion Strategy

When asked unprompted how they had first learned about the program, almost half of participants (48 percent) recalled seeing the program mentioned in a bill insert. Another 12 percent of respondents indicated that they had first heard about the program from a friend, relative, or neighbor, 12 percent through a retailer or appliance dealer. These findings are shown below in Table 3-16.

While the proportions of respondents who first heard about the program through word of mouth, a retailer/appliance dealer, radio, or separate mailing/flyer increased this year over the last two program years, the proportion of respondents who said they first heard through a bill insert declined substantially (48 percent vs. 69 - 71 percent in PY1 and PY2). Assuming there was no significant change in how bill inserts were done this year, the decline is likely an indication of the other communication methods, particularly word of mouth and retailer/appliance dealer, becoming more prevalent, which seems to be consistent with the addition of two prominent retailers to the program.

Table 3-16. How did you FIRST learn about the PROGRAM?



*Responses mentioned by less than four percent of PY3 respondents are not shown.

Retail partners market the program through in-store materials such as flyers, tear sheets, and refrigerator "cling" (stick-on advertising), most of which are provided by the ComEd program. One retail partner also advertises the program through newspaper and in-store ads, and community outreach (relying less on ComEd materials).

Sales associates are all trained to discuss the program – including eligibility requirements – with appliance customers on the sales floor or at the point of sale, often in context of what they might do with an older unit. Sales associates at two retail partners are trained to ask a set of disposal questions, which in ComEd territory includes whether they are ComEd customers, disposal intentions for their unwanted or secondary appliance, and appliance eligibility. Prompts for haul-away options are also part of the point-of-sale software at two retail partners, and include utility haul-away options, where applicable.

All non-participating retailers were at least aware of the ComEd program. One retailer in particular indicated that their sales staff is trained to direct customers to the ComEd program (website or call center) if the customer's appliance is still in working condition and they live in ComEd territory. This retailer estimated they send approximately 10 percent of their refrigerator/freezer customers to the ComEd program, but ultimately it is up to the individual customer to actually sign up for the program.

Program Enrollment

Participants have multiple options to sign up for the program – they can call ComEd to schedule an appointment, go through the ComEd website, or they could have signed up at one of the three participating retailers (through either a kiosk or sales associate).

Distribution of Enrollment by Channel

Retailers have contributed an increasing proportion of sign-ups to the program – from 1% in PY1 to 10% in PY2 to 17% in PY3. An analysis of program tracking data reveals the following breakdown of sign-ups among the various channels available (see Table 3-17).

Table 3-17. Distribution of Enrollment by Program

Channel	Room AC	Freezer	Refrigerator	Total
JACO pick up	1,036	5,938	27,052	33,990
Retailer Channel:				
Local retailer #1		54	4,821	4,875
National chain store – retailer #2	1	53	1,988	2,042
National chain store – retailer #3		1	80	81
Total	1,037	6,046	33,941	41,024

Retail Program Implementation

The three appliance retailers currently partnering with the program implementer are highly satisfied with program processes, program communication, and training. From their perspective the primary benefit of participating in the program is the additional rebate they can offer customers, which provides a competitive advantage. The program is an opportunity to improve customer service, particularly for customers who may have recycled their appliance through the program after installing a new appliance, which may have required scheduling two appointments. The program also adds promotional value to their appliance offers – particularly Energy Star – because it ties into their "green" messaging and initiatives. In fact, one retail partner wishes that the program could offer a higher rebate amount to customers that buy Energy Star, to further reinforce the energy-saving potential of Energy Star appliances. One retail partner reported that the ComEd program is one of their "strongest performers" in terms of the number of units scheduled for recycling.

All three retail partners report that hands-on training (including webinars) and frequent store visits from the program implementer are useful and very effective in training staff to discuss the program and sign up customers. Training new staff on the program is a continual challenge for retail partners, especially in areas where other rebate programs are running concurrently. While retail partners train their own staff members, the program implementer's site visits help to cover the benefits of the program, how to use the software system (QuickLink), and eligibility requirements. Frequent communication (weekly or as needed) between the program implementer and corporate retail contacts keeps stores well-informed of program information and changes.

Based on interviews with non-participating retailers there may be an opportunity to expand the program to include additional retailers if desired, particularly more local chains that do not have elaborate recycling programs already in place. While some large national chains already have significant appliance recycling programs, they may be motivated to participate by the competitive advantage the environmental messaging and rebate would provide. All non-participating retailers interviewed were aware of the ComEd program and indicated that at least some of their customers ask about the program when buying a new appliance. In addition, several of the retailers indicated that when a customer purchases a refrigerator or freezer from their store and enrolls in the ComEd program, the store's delivery team will remove the appliance and place it in a location where ComEd can easily remove it. While retailers were not asked as part of the interview if they would be interested in partnering with ComEd, there is at least awareness and some level of cooperation currently between the non-participating retailers and the program.

Alternative Disposal Practices

In PY3, we explored alternative disposal options available to ComEd customers through retail partners or outside of the ComEd program.

All participating retail partners offer a disposal service to customers outside of the ComEd program, for both working and non-working appliances. The fee for each service varies by retailer, but is usually free or low-cost ($10). Disposal through all three services can result in the unit being de-manufactured or recycled, but only one of the three retailers consistently recycles. Delivery services staff at all three retailers pick up unwanted appliances upon delivery of new units, and bring them back to retail warehouses. Two of the three retail partners maintain contracts with third-party appliance hauling services to remove unwanted units from retail warehouses, and neither of these contracts dictate disposal practices – third-party haulers can determine whether they wish to decommission and recycle or sell it for parts, or fix and re-sell it on the secondary appliance market (likely based on cost of repair and perceived market for the appliance type).

Based on in-depth interviews, appliance delivery and recycling program managers at these two retail partners estimate that few unwanted appliances in ComEd territory that are disposed through standard haul-away services (an estimated 10-15%) are ultimately re-sold by third-party vendors, as many are not working or too old to be worth fixing. Because of the small sample size and the fact that the retailers interviewed were in the business of removing appliances that were largely not working, these findings are too limited to inform the program net-to-gross ratio.

Findings from non-participating retailer interviews were similar to those of participating retailers in that all four non-participating retailers offer customers some type of removal service when they purchase a new refrigerator or freezer. Most offer this service at no charge to the customer, with the exception of one store which indicated a $30 charge for the removal of a refrigerator or freezer.

The unwanted appliances are removed by each store's staff upon delivery of the new units, and are brought back to the retail store or a warehouse where they are picked up by a third party or loaded on their own truck for disposal. All four non-participating retailers indicated that the units picked up are recycled regardless of age or working condition, but none could actually confirm exactly how this process takes place or what third-party haulers were involved. The evaluation team had a difficult time reaching corporate contacts at non-participating retailers, so we had to rely on the knowledge and information provided by sales, delivery, and customer service staff at each of the local stores. As such, sales and delivery staff indicated that all used refrigerators and freezers are recycled, by removing the unit's refrigerants, recycling anything possible from the unit including scrap metal, then disposing of anything that could not be recycled, but this was not confirmed by any third party haulers (presumably that would be under contract with the non-participating retailers). In the PY4 evaluation, we will make a concerted attempt to interview the haulers supporting the participating retailers, in order to better understand the dynamics of this used appliance market. All stores also indicated that they do not re-sell any of the used appliances.

All non-participating retailers interviewed indicated that the majority of their customers do take advantage of the store's removal services. Those interviewed said that typically if a customer is in their store to purchase a new refrigerator or freezer, they likely have an old refrigerator or freezer that they are replacing. As such, the independent third-party haulers interviewed indicated that a very small proportion of what they haul away from customers' homes includes refrigerators or freezers and almost none that are still in working order. They indicated that most appliances are typically removed by retailers, the City's trash pick-up, or ComEd, most of which are free or low-cost, compared to paying an independent hauler to remove the appliance.

Appliance Collection Process

The appliance collection process, including JACO's advance call practices, have remained primarily unchanged from last year, with the exception of the two new retailers added to the program. When delivering a new appliance to a participant in the ComEd program, the delivery teams from these two retailers will haul the old appliance back to their warehouse where the units will be sorted and held in a separate area for JACO to pick up.

Influence of Program on Energy-Saving Behavior

The program continues to influence additional energy saving behavior(s) among its participants. Based on their participation in the program, 71 percent of respondents said they have taken additional actions to save energy in their home, unchanged from the proportion who indicated the same last year. Of the respondents who have taken additional actions, the most common changes are the installation of CFLs (34 percent), energy efficient appliances (17 percent), new energy efficient windows (16 percent), turn off lights when not in use (15 percent), new HVAC equipment (14 percent), and reducing the running time of appliances unplugging appliances when not in use (12 percent).

Another 10 percent of respondents indicated that they have participated in other ComEd energy efficiency programs following their participating in the program. This represents a noticeable increase over 5 percent who indicated additional program participation during PY2. The central air conditioning programs (AC Cycling and CACES) were again listed the most by respondents.

3.2.2 Program Theory

Given modest changes in the program design, this topic was not revisited. Please refer to the PY1 report.

3.3 Cost Effectiveness Review

This section addresses the cost effectiveness of the Appliance Recycling program. Cost effectiveness is assessed through the use of the Illinois Total Resource Cost (TRC) test. The Illinois TRC test is defined in the Illinois Power Agency Act SB1592 as follows:

> *" 'Total resource cost test' or 'TRC test' means a standard that is met if, for an investment in energy efficiency or demand-response measures, the benefit-cost ratio is greater than one. The benefit-cost ratio is the ratio of the net present value of the total benefits of the program to the net present value of the total costs as calculated over the lifetime of the measures. A total resource cost test compares the sum of avoided electric utility costs, representing the benefits that accrue to the system and the participant in the delivery of those efficiency measures, to the sum of all incremental costs of end-use measures that are implemented due to the program (including both utility and participant contributions), plus costs to administer, deliver, and evaluate each*

> *demand-side program, to quantify the net savings obtained by substituting the demand-side program for supply resources. In calculating avoided costs of power and energy that an electric utility would otherwise have had to acquire, reasonable estimates shall be included of financial costs likely to be imposed by future regulations and legislation on emissions of greenhouse gases."*[8]

ComEd uses DSMore™ software for the calculation of the Illinois TRC test.[9] The DSMore model accepts information on program parameters such as number of participants, gross savings, free ridership, program costs and CO_2 reductions. It then calculates a TRC that fits the requirements of the Illinois Legislation.

One important feature of the DSMore model is that it performs a probabilistic estimation of future avoided energy costs. It looks at the historical relationship between weather, electric use and prices in the PJM Northern Illinois region and forecasts a range of potential future electric energy prices. The range of future prices is correlated to the range of weather conditions that could occur, and the range of weather is based on weather patterns seen over the historical record. This method captures the impact that extreme weather has on electricity prices. Extreme weather generally results in electricity price spikes and creates a skewed price distribution. High prices are going to be much higher than the average price while low prices are going to be only moderately lower than the average. DSMore is able to quantify the weighted benefits of avoiding energy use across years which have this skewed price distribution.

Results

Table 3-18 summarizes the unique inputs used in the DSMore model to assess the TRC ratio for the Appliance Recycling program in PY3. Most of the unique inputs come directly from the evaluation results presented previously in this report. Measure life estimates and program costs come directly from ComEd. All other inputs to the model, such as avoided costs, come from ComEd and are the same for this program and all programs in the ComEd portfolio.

[8] Illinois Power Agency Act SB1592, pages 7-8.

[9] Demand Side Management Option Risk Evaluator (DSMore) software is developed by Integral Analytics.

Table 3-18. Inputs to DSMore Model for Appliance Recycling Program

Item	Value Used
Measure Life	8
Utility Administration and Implementation Costs	$5,134,644
Utility Incentive Costs	$1,075,315
Net Participant Costs	$0

Based on these inputs, the Illinois societal TRC for this program is 3.53 and the program passes the Illinois TRC test.

Section 4. Conclusions and Recommendations

This section highlights the findings and recommendations from the evaluation of the Appliance Recycling Program implemented by JACO on behalf of ComEd. The objectives of the evaluation were to: (1) quantify net energy and peak demand savings impacts from the program during Program Year 3 (PY3); and (2) to determine key process-related program strengths and weaknesses and provide recommendations to improve the program.

Below are the key conclusions and recommendations.

4.1 Conclusions

4.1.1 Key Impact Findings

The PY3 net energy savings goal for this program was 30,900 MWh and the program-reported energy savings was slightly more than this, 33,093 MWh[10]. The verified energy savings is somewhat higher than this – 44,851 MWh, for an overall realization rate of 136%.

Gross savings per unit (without adjustment for the part-use factor) are very close for the ex-ante and ex-post program-verified savings estimates, since ComEd used virtually the same approach to calculate ex-ante gross savings per unit as was used in this evaluation. Key differences are with respect to the part-use factor and net-to-gross ratio assumptions. Program verified part-use factors were 90% for refrigerators, and 75% for freezers, while the ex-ante assumption was 75% for refrigerators and 65% for freezers. The net-to-gross ratio for the ex-ante estimates was somewhat higher than ex-post for refrigerators (0.70 ex-ante vs. 0.67 for ex-post), identical for freezers, and higher for room ACs (1.00 for ex-ante vs. 0.70 for ex-post). The higher program verified values for the part-use factors yield the higher total ex-post net savings quantities.

Because of inadequate tracking data and the fact that room AC units contribute a very small proportion of the program savings (0.1%), it was not possible to fully evaluate room AC savings. Program-claimed gross savings for room ACs are accepted as verified. The evaluation-verified net-to-gross ratio of 0.70 was then applied.

4.1.2 Key Process Findings

In order to meet aggressive PY3 goals, ComEd enrolled two new retailers into its program in PY3, both national chain stores (in addition to a local appliance retailer, which has been participating since PY1), and used a combination of higher incentives and 'specials' to promote the program. ComEd increased the program incentive amount in PY3, from $25 per unit at the

[10] As reported in *PY3 Ex Ante & Plan Summary.xls* provided by ComEd.

beginning of the program to $35 in November of 2010. In addition, in conjunction with ARRA, ComEd continued to partner with the ARRA-Illinois Energy Star Rebates program as it did in PY2. Finally, ComEd pursued an additional marketing strategy to further publicize the program that involved sending marketing collateral to approximately 200 retailers.

Customer survey results and retail partner interviews suggest that these program changes were both well planned and well executed. Overall satisfaction among participants was quite high again this year, with 98% of participants indicating they are satisfied with the program (as shown by satisfaction ratings ranging from 7 to 10 on a 0-10 scale, where 0 is very dissatisfied and 10 is very satisfied). Customers indicate that their satisfaction is driven by the cash incentive as well as the convenience of the pickup service and overall ease of participation, with 97% saying they would recommend the program to a friend or colleague.

A number of these program changes are reflected in how customers are hearing about the program. While bill inserts continue to be an effective way of promoting the program, there was a recognizable increase (from PY2 to PY3) in the number of customers who heard about the program from a friend, relative, or colleague and from appliance retailers. This increased reach, is further supported by the fact that all the nonparticipating retailers interviewed as part of this effort were aware of the program.

The three appliance retailers currently partnering with the program implementer are highly satisfied with program processes, program communication, and training. In particular, all three partners indicate that hands-on training (including webinars) and frequent store visits from the program implementer are useful and very effective in training staff. Additionally, these retailers suggest that frequent communications (weekly or as needed) between the program implementer and corporate contacts keeps stores well-informed of program information and changes.

For customers, their positive experiences with the program continue to influence additional energy savings behaviors. Based on their participation in the program, 71 percent of the participants interviewed said they have taken additional actions to save energy in their home. These actions include, but are not limited to, the installation of CFLs and efficient appliances as well as behavioral changes, such as turning off the lights when not in use.

All in all, the challenge for the program moving forward would appear to be a very welcomed one—maintain the high levels of customer and participating retailer service that was provided in PY3.

4.2 *Recommendations*

4.2.1 Impact Recommendations

- As part of the PY4 evaluation activities, an in situ metering study is currently underway. We recommend that the results of that study be used to validate the gross kWh savings values coming from the regression equations for PY4. In addition, we recommend the study results be used to set kW savings values in PY4, in lieu of using ComEd's planning estimates, as is currently being done.
- As in PY1 and PY2, we continue to recommend the program tracking data receive periodic data quality reviews for data quality and completeness. Data exported for the evaluation team should also be checked for anomalies. Incomplete data fields need to be populated, particularly those data fields that are critical to the evaluation, such as appliance brand, model number, age/year manufactured, size, configuration and location. Below are more specific recommendations regarding incomplete data fields and how they should be addressed:
    - **Prior Location of Recycled Unit.** A substantial number of records had 'other' or 'unknown'. Possibly these are default values in the database, but they are not useful for evaluation purposes. ComEd should ensure that JACO gather this information during the scheduling call, if at all possible.
    - **Is Unit Replaced.** This, potentially, is an important field for evaluation, however, in all cases, it is populated with 'unknown'. Again, ComEd should ensure that JACO gathers this information during the scheduling call.
- A full market assessment should be conducted in the PY4 evaluation. The objective is to assess the state of both the new and used appliance markets with respect to disposal and recycling of older units.

4.2.2 Process Recommendations

- Customers and retailer partners are highly satisfied with the program. Maintaining such high levels of satisfaction, given the growth of the program, is an outstanding accomplishment. It will be important, as the program continues to progress, to routinely review program processes and procedures in order to maintain these satisfaction levels.
- All three retail partners who participate in the program are motivated by the environmental benefits of the program in addition to the competitive advantage that an additional rebate provides. If the program wishes to pursue additional retail partnerships, the program's tie-in to green corporate practices may be one benefit to highlight. A previous relationship with JACO for other recycling programs or disposal services was also a key factor in two retail partnerships.

- The cost to operate the recycled unit is viewed as an important reason for disposal by just over one-third of recyclers of both unit types. This is an area where further education of ComEd customers is needed, to make them aware of the considerable expense associated with running these older units. We recommend that ComEd include messaging in its program marketing literature and advertising to highlight the cost per year of operating older refrigerators and freezers.
- The program may wish to consider a tiered incentive structure to motivate Energy Star purchases. Such a structure would involve a higher incentive or bonus for those that replace their old unit with a new Energy Star rated unit.
- If feasible, ComEd may wish to consider developing program advertising that mentions retail partners by name. This will boost awareness of retail partners and lead additional customers to sign up for the retail program.

Section 5. Appendices

5.1 Data Collection Instruments

The data collection instruments used in this evaluation consisted of (1) a participating customer survey; (2) in-depth interview guides for the ComEd program manager and JACO program management and implementers; (3) interview guides for participating and nonparticipating retailers; and (4) an interview guide for used appliance dealers/haulers.

5.1.1 ComEd Residential Appliance Recycling Participant Survey

COMED RESIDENTIAL APPLIANCE RECYCLING PARTICIPANT SURVEY

QUOTA CHECK:
USE SAMPLE:

- **IF REF_NUM=1 and REFRIGERATOR QUOTA NOT MET OR**
- **IF FRZ_NUM=1 and FREEZER QUOTA NOT MET**

INTRODUCTION AND SCREENER

Hello, this is [SURVEYOR NAME] from Opinion Dynamics calling on behalf of Commonwealth Edison company. This is not a sales call. May I please speak with [CUSTOMER_NAME]? We are contacting customers who had refrigerators, freezers or room air conditioners removed through an appliance pick-up and recycling program offered by Commonwealth Edison.

Are you the person who was most involved and familiar with the removal?

IF NO, NOT RIGHT PERSON: May I please speak to the person who would know the most about the removal? REPEAT INTRODUCTION AND CONTINUE

IF NO, NO REFRIGERATOR OR FREEZER PICKED UP: THANK AND TERMINATE

IF YES, RIGHT PERSON: We are conducting a study to evaluate Commonwealth Edison's appliance pick up and recycling program and would like to include your opinions. This is required by the Illinois Commerce Commission and will be used to verify the effectiveness of the program and to make improvements.

(IF NEEDED: It will take about 15 minutes.)

This call may be monitored or recorded for quality purposes.

C1. Are you currently talking to me on a regular landline phone or a cell phone?
1. (Regular landline phone)
2. (Cell phone)
8. (Don't Know)
9. (Refused)

<SKIP IF C1=1>
C2. Are you currently in a place where you can talk safely and answer my questions?
1. (Yes)
2. (No)
8. (Don't Know)
9. (Refused)

SCREENING QUESTIONS
S0. Is ComEd your electric company or do you receive electricity from someone else?

1. ComEd
2. Someone Else [TERMINATE]
8. (Don't know)
9. (Refused)

S1. Our records show that you had **<S1_READ>** picked up by ComEd or its subcontractor JACO. Is this correct?

01. Yes, correct
00. No, it was [RECORD VERBATIM and TERMINATE]
98. Don't know [TERMINATE]
99. Refused [TERMINATE]

[READ IF TOTAL=1]
S2a Next, I'm going to ask you some specific questions about the [REFRIGERATOR if REF_NUM=1, FREEZER if FRZ_NUM=1, AIR CONDITIONER if AC_NUM=1] that was picked up.

[READ IF TOTAL>1]
S2b Next, I'm going to ask you some specific questions about the **<S2B READ> that** were picked up by ComEd.

[Read Section A if REF_NUM=1 and if REFRIGERATOR_QUOTA not met]
SECTION A: REFRIGERATOR CHARACTERISTICS

A0. According to our records, you had a refrigerator removed that was made by **<REF_MANU>**]. Is this correct?
01. Yes
00. No, it was [RECORD MANUFACTURER VERBATIM]
8. (Don't know) [TERMINATE IF TOTAL=1, ELSE C0]
9. (Refused) [TERMINATE IF TOTAL=1, ELSE C0]

A1 At the time this refrigerator was picked up, were you using it as your main refrigerator, or had it been a secondary or spare? (Interviewer: a main refrigerator is typically in the kitchen, a secondary or spare is usually kept someplace else and might or might not be running. If the person recently bought a new main refrigerator and was just waiting for the old one to be picked up, it should be classified as "main.")

1 Main
2 Secondary or Spare
98 Don't know
99 Refused

QUOTA CHECK … Use responses to 1 for Primary quota, 2 for Secondary quota. Once quota met, T&T

[ASK A2 IF A1=2 ELSE SKIP TO A5]

A2 How long had you been using this refrigerator as a secondary or spare? [IF NEEDED: Please estimate the number of years. If respondent is confused, reinforce that "how many years had it been a spare when you decided to get rid of it."]

[NUMERIC OPEN END RECORD IN YEARS]
00 (Less than one year)
98 Don't know
99 Refused

A3 Thinking just about the past year, was the spare refrigerator plugged in and running …

1 All the time
2 For special occasions only
3 During certain months of the year only, or
4 Was it never plugged in and running?
98 Don't know
99 Refused

[ASK A4 and A4A IF A3=02 OR 03]
A4 If you add up the total time your spare refrigerator was plugged in and running during the last 12 months that you had it, about how many total months would that be? Your best estimate is okay. (GET NEAREST MONTH OR HALF MONTH)

[RECORD IN MONTHS]
00 (Less than 1 month)
98 Don't know
99 Refused

[ASK IF A3=02 OR 03]
A4a Was the refrigerator running during the summer or was it mainly running during other times of the year?

1. Running during the summer
2. Mainly running other times of the year
3. (A mix of both summer and other times of the year)
98. (Don't know)
99. (Refused)

A5 Where would the refrigerator have been located if it had not been removed by ComEd?

1 (Kitchen)
2 (Garage)
3 (Porch/Patio)
4 (Basement)
00 (Other (SPECIFY:)
98 Don't know
99 Refused

[SKIP A5B IFA5=1 OR 98 or 99]
A5B Was the space heated or not?

1 Yes
2 No
3 (Heated part of the year)
98 Don't know
99 Refused

[SKIP IF A5 98 or 99]
A5C Was the space air-conditioned or not?
1 Yes
2 No
3 (Air conditioned part of the year)
98 Don't know
99 Refused

A6 How old was the refrigerator when ComEd removed it?
[NUMERIC OPEN END RECORD IN YEARS]
00 (Less than one year)
98 Don't know
99 Refused

A7 Did you replace the refrigerator that ComEd picked up with another one?
1 Yes
2 No
8 (Don't know)
9 (Refused)

[ASK IF A7=1 else skip to A9]
A8aa. Did you install the replacement refrigerator before or after the old refrigerator was picked up?
1 Before [read in before in A8a]
2 After [read in after in A8a]
3 (Got it the same day) skip to A8b
8 (Don't know) Skip to A8b
9 (Refused) Skip to A8b

A8a How long <before/after> the old one was picked up did you install the replacement refrigerator? RECORD TIME INTERVAL
1 (Same day)
2 (Within one to two weeks)
3 (Within one month)
4 (Within two to three months)
6 (Within four to six months)
7 (Within six to twelve months/ one year)
8 (More than one year later)
00 (Other (record verbatim))
98 (Don't know)

99 (Refused)

A8b Was the replacement refrigerator brand new or used?

1. Brand new
2. Used
8. (Don't know)
9. (Refused)

A8c Does your replacement refrigerator have … (READ)

1 A single door, with a freezer compartment inside
2 Two doors, side by side
3 A Top freezer
4 Or a Bottom freezer?
00 Other (SPECIFY:___)
98 (Don't know)
99 (Refused)

A8d Is the replacement refrigerator frost free or manual defrost?

1 Frost free
2 Manual defrost
00 Other (SPECIFY:___)
98 (Don't know)
99 (Refused)

A8e What size is this replacement refrigerator in cubic feet? IF NEEDED: Your best estimate is fine. CLARIFY FRACTIONS TO GET TO NEAREST NUMBER.

1 Less than 16 cu. ft.
2 16-19 cu. ft.
3 20-22 cu. ft.
4 23-25 cu. ft.
5 Greater than 25 cu. ft.
98 (Don't know)
99 (Refused)

[ASK A8e1 ONLY IF A8e IS 98 (DK) OR 99 (REF)]

A8e1 Is your replacement refrigerator larger, smaller or the same size as the one it replaced?

1 Larger
2 Smaller
3 Same Size
98 (Don't know)
99 (Refused)

A8f Was getting the replacement a major reason you decided to discard the old one?

1 Yes

2 No
8 (Don't know)
9 (Refused)

[ASK A8g ONLY IF A8b=2]

A8g How old is this replacement refrigerator? [RECORD IN YEARS]
[NUMERIC OPEN END]
00 (Less than one year)
98 (Don't know)
99 (Refused)

[ONLY READ TA9 IF A7=1]

TA9. Now let's get back to your old refrigerator that was removed by ComEd.

A9 When you first heard about ComEd's Appliance Recycling Program, were you already considering getting rid of this refrigerator? This could have been by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center.
1 Yes
2 No
98 (Don't know)
99 (Refused)

A10a. If you had been unable to get rid of your refrigerator through the ComEd appliance recycling program, would you have still gotten rid of the refrigerator, or would you have kept it?
1 Gotten rid of it
2 Kept it
98 (Don't know)
99 (Refused)

[ASK IF A10a = 1]
A10b. If the ComEd program hadn't been available, would you have gotten rid of the refrigerator within 6 months of when you did, within a year of when you did, or would it have taken longer than a year for you to get rid of this refrigerator?
1. Within 6 months
2. Within a year
3. Over a year
98. (Don't know)
99. (Refused)

SECTION B: CONSIDERATION OF ALTERNATIVES SECTION
[ASK SECTION B IF A0=01,00]

B1 I am now going to read a list of alternative ways that you could have disposed of this refrigerator. For each, tell me if this is a method you had considered using or doing. Did you consider… [ROTATE 1-5; Multiple response]
1. Selling it

2. Giving it away for free
3. Having it removed by an appliance dealer or retailer
4. Taking it to a dump or recycling center
5. Hiring someone else to haul it away
6. [ASK IF A10a=1,8,9] Keeping it
98 (DON'T KNOW)
99 (REFUSED)

[ASK IF B1_1=1]
B1a. You said you considered selling your refrigerator. Did you consider selling the refrigerator to an appliance dealer, or to a private party (like a friend, relative or by running an ad)?

1. Dealer
2. Private party (friend, relative, or by running ad)
3. Both
98. (Don't know)
99. (Refused)

[ASK IF B1_2=1]
B1b. You said you considered giving away your refrigerator. Did you consider giving it to a private party (like a friend, relative or by running an ad), or to a charitable organization? (IF NEEDED: examples of a charitable organization could be Goodwill Industries or a Church)

1. Private party (friend, relative or by running an ad)
2. Charitable organization
3. Both
98. (Don't know)
99. (Refused)

[ASK IF B1_4=1]
B1c. You said you considered taking away the refrigerator. Did you consider taking it to a dump, or to a recycling center?

1. Dump
2. Recycling Center
3. Both
98. (Don't know)
99. (Refused)

[ASK IF A10a=2 or B1_6=1]
B1d. You said you considered keeping the refrigerator. Did you consider storing it unplugged, or using it as a spare?

1 Storing it unplugged
2 Using it as a spare
3 Both
98 (Don't know)
99 (Refused)

B7 Now suppose that ComEd appliance recycling program hadn't been available. Which one of these alternatives that we've just discussed would you have been most likely to do, if the ComEd appliance recycling program had not been available? [INDICATE ONE RESPONSE ONLY]

1. [ASK IF B1a=2,3] Selling it to a private party
2. [ASK IF B1a=1,3] Sell it to an appliance dealer
3. [ASK IF B1b=1,3] Give it away to a private party
4. [ASK IF B1b=2,3] Give it away to a charitable organization
5. [ASK IF B1_3=1] Have it removed by an appliance dealer or retailer
6. [ASK IF B1c=1,3] Haul it to the dump
7. [ASK IF B1c=2,3] Haul it to the recycling center
8. [ASK IF B1_5=1] Hired someone else to haul it away
9. [ASK IF B1d=1,3] Keep it and store it unplugged
10. [ASK IF B1d=2,3] Keep it and use it as a spare

00. (Some other way (SPECIFY:_____)
98. (Don't know)
99. (Refused)

Plans for keeping and using refrigerator as a spare
[ASK B4B THRU B4E IF B1d=2,3, else skip to B8]

B4B You mentioned [if B7=10, read "you would have kept this refrigerator and used it as a spare"] [if B7<>10, read "you considered keeping this refrigerator and using it as a spare"] if the ComEd appliance recycling program weren't available. For how many years would you have used this refrigerator as a spare? (IF NEEDED: Your best estimate is fine.)

[NUMERIC OPEN END; record in years]
77 (Until it broke, indefinitely)
00 (Less than 1 year)
98 Don't know
99 Refused

B4C. Where would this refrigerator have been located if you hadn't gotten rid of it and had used it as a spare? IF NEEDED, CLARIFY: What room? IF NEEDED: Your best estimate is fine.

1 (Kitchen)
2 (Garage)
3 (Porch)
4 (Basement)
00 Other (SPECIFY:___)
98 Don't know
99 Refused

[SKIP IF B4C=1, 98 or 99]
[SKIP IF A5=B4C=2 OR A5=B4C=3 OR A5=B4C=4]
B4D. Would this have been a heated space?
1. Yes
2. No

3. (Part of the year)
8. (Don't know)
9. (Refused)

[SKIP IF B4C=98 or 99]
[SKIP IF A5=B4C=2 OR A5=B4C=3 OR A5=B4C=4]
B4E Would this have been an air-conditioned space?

1 Yes
2 No
3 (Part of the year)
98. (Don't know)
99. (Refused)

[ASK IF B1a=1-3]
B8. You mentioned that you considered selling your refrigerator to [IF B1a=1, read in "an appliance dealer"] [IF B1a=2, read in, "a private party"] [If B1a=3, read in "an appliance dealer or private party"]. Did you actually attempt to sell your refrigerator in this way before participating in the program?

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

[ASK IF B8=1 & B1a=3]
B8a. Did you attempt to trade in or sell the refrigerator to an appliance dealer, or to a private party? (IF NEEDED: Private party could be a friend, family member, neighbor or someone you find through running an ad)

1. To a dealer
2. To a private party
3. Both
98. (Don't know)
99. (Refused)

[ASK IF B8=1]
B8b. Why did you not follow through with this transaction?

1. (Couldn't find an interested dealer/non-dealer at the price I wanted)
2. (Couldn't find an interested dealer/non-dealer because of the unit's condition)
3. (Decided recycling unit was more important than selling it)
4. (Other (SPECIFY :___)
98. (Don't know)
99. (Refused)

[ASK IF B8=1]
B8c. If you had sold this refrigerator to [IF B1a=2 or B8a=2: a private party (e.g. not a dealer)] [IF B1a=1 or B8a=1: an appliance dealer] [IF B1a=3 or B8a=3,98,99: someone], how much money do you think you would have received for it?

1. Dollars _____($1 to 2,000)
98. (Don't know)
99. (Refused)

[ASK IF B1_3=1]
B8d. If an appliance dealer were to take it away, how much, if anything, do you think you would have to pay for this service?

1. Nothing /free service
2. Dollars _____($1 to 2,000)
98. (Don't know)
99. (Refused)

[ASK IF B1_4=1]
B2g. One factor in disposing of a refrigerator is being able to physically move and transport it. Do you have the ability to do this yourself, or would you need assistance such as renting or borrowing a truck or having someone other than your immediate family help you?

1. Yes, could do it myself
2. No
98. (Don't know)
99. (Refused)

[ASK B2, B3, B5, B6 of all refrigerator participants]
B2 What was the condition of the refrigerator when you signed up for the ComEd program? Would you say …

1 It worked and was in good physical condition
2 It worked but needed minor repairs like a door seal or handle, or
3 It worked but had some problems
4 (It didn't work)
98 (Don't know)
99 (Refused)

B3. Thinking about the refrigerator that ComEd picked up, how much money do you think it would have cost each month to run it if it were running full-time?

1 Nothing
2 $1 to $5
3 $6 to $10
4 $11 to $15
5 $16 to $20
6 More than $20
98 Don't know
99 Refused

B5 There may have been a number of reasons why you chose to get rid of the refrigerator that we've been discussing. Using a 0 to 10 scale where 0 is not at all important and 10 is extremely important, please tell me how important each reason was in your decision to get rid of it?

a. The refrigerator was expensive to run

b. [ASK IF A1=2] The refrigerator was a spare that I did not use very much
c. [ASK IF A7=1] The refrigerator was old and I wanted something with more modern features
d. [ASK IF A7=1 & A8E1<>2,3] I wanted a bigger refrigerator

B6 Were there any other reasons you chose to get rid of the refrigerator?
[OPEN END]
96 (No)
98. (Don't know)
99. (Refused)

FREEZER SECTION
[READ IF FRZ_NUM=1 and if FREEZER_QUOTA not met]

SECTION C: FREEZER CHARACTERISTICS

C0. According to our records, you had a freezer removed that was made by <**FRZ_MANU**>. Is this correct?
01. Yes
00. No [RECORD MANUFACTURER VERBATIM]
8. (Don't know) [TERMINATE IF TOTAL=1, ELSE E0]
9. (Refused) [TERMINATE IF TOTAL=1, ELSE E0]

C1 How long had you been using this freezer? [RECORD IN YEARS. If respondent is confused, reinforce that "how many years had it been used <u>when you decided to get rid of it.</u>"]
[NUMERIC OPEN END RECORD IN YEARS]
0 (Less than one year)
98 Don't know
99 Refused

C2 Thinking just about the past year, was the freezer plugged in and running …
1 All the time
2 For special occasions only
3 During certain months of the year only, or
4 Was it never plugged in and running?
98 Don't know
99 Refused

[ASK C3 and C4 IF C2=02 OR 03]
C3 If you add up the total time your freezer was plugged in and running during the last 12 months that you had it, about how many total months would that be? Your best estimate is okay. (GET NEAREST MONTH OR HALF MONTH)
[RECORD IN MONTHS]
0 (Less than 1 month)
98 Don't know
99 Refused

C4 Was the freezer running during the summer or was it mainly running during other times of the year?

1. Running during the summer
2. Mainly running other times of the year
3. (A mix of both summer and other times of the year)
8. (Don't know)
9. (Refused)

C5 Where would the freezer have been located if it had not been removed by ComEd?

1 (Kitchen)
2 (Garage)
3 (Porch/Patio)
4 (Basement)
00 (Other (SPECIFY:)
98 Don't know
99 Refused

[SKIP IF C5=1 OR 98 or 99]
C5B Was the space heated or not?

1 Yes
2 No
3 (Heated part of the year)
98 Don't know
99 Refused

[SKIP IF C5=98 or 99]
C5C Was the space air-conditioned or not?

1 Yes
2 No
3 (Air conditioned part of the year)
98 Don't know
99 Refused

C6 How old was the freezer when ComEd removed it?

[NUMERIC OPEN END RECORD IN YEARS]
1 (Less than one year)
98 Don't know
99 Refused

C7 Did you replace the freezer that ComEd picked up with another one?(NOTE: We are only interested in stand-alone freezers, not freezers that are part of your refrigerator)

1 Yes
2 No
8 (Don't know)

9 (Refused)

[ASK IF C7=1 else skip to C9]
C8aa. Did you install the replacement freezer before or after the old freezer was picked up?
1 Before [read in before in C8a]
2 After [read in after in C8a]
3 (Got it the same day) Skip to C8b
8 (Don't know) Skip to C8b
9 (Refused) Skip to C8b

C8a How long <before/after> the old one was picked-up did you install the replacement freezer? RECORD TIME INTERVAL
1 (Same day)
2 (Within one to two weeks)
3 (Within one month)
4 (Within two to three months)
6 (Within four to six months)
7 (Within six to twelve months/ one year)
8 (More than one year later)
00 (Other: record verbatim))
98 (Don't know)
99 (Refused)

C8b Was the replacement freezer brand new or used?
1. Brand new
2. Used
8. (Don't know)
9. (Refused)

C8c Was your replacement freezer … (READ)
1 A chest freezer or
2 An upright freezer
00 (Other - Specify)
98 (Don't know)
99 (Refused)

C8d Is the replacement freezer frost free or manual defrost?
1 Frost free
2 Manual defrost
00 Other (SPECIFY:___)
98 Don't know
99 Refused

C8e What size is this replacement freezer in cubic feet? IF NEEDED: Your best estimate is fine. CLARIFY FRACTIONS TO GET TO NEAREST NUMBER.
1. Less than 10 cubic feet

2. 10 to 15 cubic feet
3. 16 to 20 cubic feet
4. More than 20 cubic feet
00. Other (SPECIFY:)
98 Don't know
99 Refused

[ASK C8e1 ONLY IF C8e IS 98 (DK) OR 99 (REF), ELSE C8f]

C8e1 Is your replacement freezer larger, smaller or the same size as the one it replaced?

1 Larger
2 Smaller
3 Same Size
98 Don't know
99 Refused

C8f Was getting the replacement a major reason you decided to discard the old one?

1 Yes
2 No
8 (Don’t know)
9 (Refused)

[ASK C8g ONLY IF C8b=2]

C8g How old is this replacement freezer?

[NUMERIC OPEN END RECORD IN YEARS]
0 (Less than one year)
98 Don’t know
99 Refused

[ONLY READ TC9 IF C7=1]

TC9. Now let’s get back to your old freezer that was removed by ComEd.

C9 When you first heard about ComEd’s Appliance Recycling Program, were you already considering getting rid of this freezer? This could have been by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center.

1 Yes
2 No
98 Don’t know
99 Refused

C10. If you had been unable to get rid of your freezer through the ComEd appliance recycling program, would you have still gotten rid of the freezer, or would you have kept it?

1 Gotten rid of it
2 Kept it

98 Don't know
99 Refused

[ASK IF C10=1]
C11b. If the ComEd program hadn't been available, would you have gotten rid of the freezer within 6 months of when you did, within a year of when you did, or would it have taken longer than a year for you to get rid of this freezer?

1. Within 6 months
2. Within a year
3. Over a year
8. (Don't know)
9. (Refused)

SECTION D: CONSIDERATION OF ALTERNATIVES SECTION
[ASK SECTION IF C0=01,00]
D1 I am now going to read a list of alternative ways that you could have disposed of this freezer. For each, tell me if this is a method you had considered using or doing. Did you consider… [ROTATE 1-5]

1. Selling it
2. Giving it away for free
3. Having it removed by an appliance dealer or retailer
4. Taking it to a dump or recycling center
5. Hiring someone else to haul it away
6. [ASK IF C10=1,8,9] Keeping it

[ASK IF D1_1=1]
D1a. You said you considered selling your freezer. Did you consider selling the freezer to an appliance dealer, or to a private party (like a friend, relative or by running an ad)?

1. Dealer
2. Private party (friend, relative, or by running ad)
3. Both
98. (Don't know)
99. (Refused)

[ASK IF D1_2=1]
D1b. You said you considered giving away your freezer. Did you consider giving it to a private party (like a friend, relative or by running an ad), or to a charitable organization? (IF NEEDED: examples of a charitable organization could be Goodwill Industries or a Church)

1. Private party (friend, relative or by running an ad)
2. Charitable organization
3. Both
98. (Don't know)
99. (Refused)

[ASK IF D1_4=1]

D1c. You said you considered taking away the freezer. Did you consider taking it to a dump, or to a recycling center?

1. Dump
2. Recycling Center
3. Both
98. (Don't know)
99. (Refused)

[ASK IF C10=2 or D1_6=1]

D1d. You said you considered keeping the freezer. Did you consider storing it unplugged, or using it as a spare?

1 Storing it unplugged
2 Using it as a spare
3 Both
98 (Don't know)
99 (Refused)

D7 Now suppose that ComEd appliance recycling program hadn't been available. Which one of these alternatives that we've just discussed would you have been <u>most likely</u> to do, if the ComEd appliance recycling program had not been available?

1. [ASK IF D1a=2,3] Sell it to a private party
2. [ASK IF D1a=1,3] Sell it to an appliance dealer
3. [ASK IF D1b=1,3] Give it away to a private party
4. [ASK IF D1b=2,3] Give it away to a charitable organization
5. [ASK IF D1_3=1] Have it removed by an appliance dealer or retailer
6. [ASK IF D1c=1,3] Haul it to the dump
7. [ASK IF D1c=2,3] Haul it to the recycling center
8. [ASK IF D1_5=1] Hire someone else to haul it away
9. [ASK IF D1d=1,3] Keep it and store it unplugged
10. [ASK IF D1d=2,3] Keep it and use it as a spare

00. (Some other way (SPECIFY:_____)
98. (Don't know)
99. (Refused)

Plans for keeping and using freezer as a spare
[ASK D4B THRU D4E IF D1d=2,3, else skip to D8]

D4B You mentioned [if D7=10, read "you would have kept this freezer and used it as a spare"] [if D7<>10, read "you considered keeping this freezer and using it as a spare"] if the ComEd appliance recycling program wasn't available. For how many years would you have used this freezer as a spare? IF NEEDED: Your best estimate is fine.

[NUMERIC OPEN END]
77 (Until it broke, indefinitely)
0 (Less than 1 year)
98 Don't know
99 Refused

D4C. Where would this freezer have been located if you hadn't gotten rid of it and had used it as a spare? IF NEEDED, CLARIFY: What room? IF NEEDED: Your best estimate is fine.

1 (Kitchen)
2 (Garage)
3 (Porch)
4 (Basement)
00 Other (SPECIFY:___)
98 Don't know
99 Refused

[SKIP IF D4C=1 OR D4C=98 or 99]
[SKIP IF C5=D4C=2 OR C5=D4C=3 OR C5=D4C=4]
D4D. Would this have been a heated space?
1. Yes
2. No
3. (Part of the year)
8. (Don't know)
9. (Refused)

[SKIP IF D4C=98 or 99]
[SKIP IF C5=D4C=2 OR C5=D4C=3 OR C5=D4C=4]
D4E Would this have been an air-conditioned space?

1 Yes
2 No
3 (Part of the year)
98. (Don't know)
99. (Refused)

[ASK IF D1a=1-3]
D8. You mentioned that you considered selling your freezer to [IF D1a=1, read in "an appliance dealer"] [IF D1a=2, read in, "a private party"] [If D1a=3, read in "an appliance dealer or private party"]. Did you actually attempt to sell your freezer in this way before participating in the program?

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

[ASK IF D8=1 & D1a=3]
D8a. Did you attempt to trade in or sell the freezer to an appliance dealer, or to a private party? (IF NEEDED: Private party could be a friend, family member, neighbor or someone you find through running an ad)

1. To a dealer
2. To a private party
3. Both
98. (Don't know)

99. (Refused)

[ASK IF D8=1]
D8b. Why did you not follow through with this transaction?

1. (Couldn't find an interested dealer/non-dealer at the price I wanted)
2. (Couldn't find an interested dealer/non-dealer because of the unit's condition)
3. (Decided recycling unit was more important than selling it)
4. (Other (SPECIFY :___)
98. (Don't know)
99. (Refused)

[ASK IF D8=1]
D8c. If you had sold this freezer to [IF D1a=2 or D8a=2: a private party (e.g. not a dealer)] [IF D1a=1 or D8a=1: an appliance dealer] [IF D1a=3 or D8a=3,98,99: someone], how much money do you think you would have received for it?

1. Dollars _____($1 to 2,000)
98. (Don't know)
99. (Refused)

[ASK IF D1_3=1]
D8d. If an appliance dealer were to take it away, how much, if anything, do you think you would have to pay for this service?

1. Nothing /free service
2. Dollars _____($1 to 2,000)
98. (Don't know)
99. (Refused)

[ASK IF D1_1=1]
D2g. One factor in disposing of a freezer is being able to physically move and transport it. Do you have the ability to do this yourself, or would you need assistance such as renting or borrowing a truck or having someone other than your immediate family help you?

1. Yes, could do it myself
2. No
98. (Don't know)
99. (Refused)

[ASK D2, D3, D5, D6 of all freezer participants]
D2 What was the condition of the freezer when you signed up for the ComEd program? Would you say …

1 It worked and was in good physical condition
2 It worked but needed minor repairs like a door seal or handle, or
3 It worked but had some problems
4 (It didn't work)
98 (Don't know)
99 (Refused)

D3. Thinking about the freezer that ComEd picked up, how much money do you think it would have cost each month to run it if it were running full-time?

1 Nothing
2 $1 to $5
3 $6 to $10
4 $11 to $15
5 $16 to $20
6 More than $20
98 Don't know
99 Refused

D5 There may have been a number of reasons why you chose to get rid of the freezer that we've been discussing. Using a 0 to 10 scale where 0 is not at all important and 10 is extremely important, please tell me how important each reason was in your decision to get rid of it?

a. The freezer was expensive to run
b. I did not use the freezer very much
c. [ASK IF C7=1] The freezer was old and I wanted something with more modern features
d. [ASK IF C7=1 AND C8E1<>2,3] I wanted a bigger freezer

D6 Were there any other reasons you chose to get rid of the freezer?

[OPEN END; accept up to two]
96. (No)
98. (Don't know)
99. (Refused)

AC Section
[READ IF AC_NUM=1]

SECTION E: ROOM AIR CONDITIONER CHARACTERISTICS

E0. According to our records, you also had a room air conditioner removed by ComEd. Is this correct?

1. Yes
2. No [TERMINATE IF TOTAL=1, ELSE G1]
8. (Don't know) [TERMINATE IF TOTAL=1, ELSE G1]
9. (Refused) [TERMINATE IF TOTAL=1, ELSE G1]

E00 Was this your own AC or were you discarding someone else's unit?

1. My own unit
2. Someone else's unit
3. Something else (RECORD VERBATIM)
98. (Don't know)
99. (Refused)

IF E00=1, THEN CONTINUE, ELSE E6

E1 At the time the room air conditioner was picked up, was it your only AC, or did you have additional AC units?

1 Only AC
2 Had additional ACs
98 Don't know
99 Refused

E2 Thinking just about the most recent summer that you still had this AC, was it plugged in and running?

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

[ASK E3 IF E2=1 ELSE SKIP TO E6]

E3. Still thinking about this last summer that you had the room AC unit, did you run it most days regardless of the temperature or only on days when the temperature reached a certain level?

1. Most days
2. Only when temperature reached a certain level
98. (Don't know)
99. (Refused)

[ASK E3A IF E3=2, ELSE E4]

E3a. How hot did it have to get inside your home or condominium before you ran the room AC unit?

1 Less than 70 degrees
2 70 to 75 degrees
3 76 to 80 degrees
4 81 to 85 degrees
5 Above 85 degrees
00 Other (record verbatim)
98. (Don't know)
99. (Refused)

E4. When you were cooling your home or condominium, did you tend to run the room AC unit all day long, or only when you were home or using that room?

1. All the time
2. Only when home/using the room
98. (Don't know)
99. (Refused)

E5 In what room was the room AC unit located?

1. (Bedroom)
2. (Living room)
3. (Dining room)
4. (Kitchen)

5. (Hallway)
6. (Other)
8. (Don't know)
9. (Refused)

E6. At the time of the pick-up, how old was the room air conditioner?

[NUMERIC OPEN END RECORD IN YEARS]
0 (Less than one year)
98 Don't know
99 Refused

E7 Did you replace the AC unit ComEd picked up with a different one? [IF NEEDED: This could have been a different type of AC unit, such as a central AC unit.]
1. Yes
2. No
8. (Don't know)
9. (Refused)

[ASK IF E7=1 ELSE SKIP TO E10]
E8aa. Did you install the replacement AC before or after the old AC was picked up?
1 Before [read in before in E8]
2 After [read in after in E8]
3 (Got it the same day) [skip to E8b]
8 (Don't know) [Skip to E8b]
9 (Refused) [Skip to E8b]

E8 How long <before/after> the old one was picked-up did you install the replacement AC? (RECORD TIME INTERVAL)
1 Same day
2 Within one to two weeks
3 Within one month
4 Within two to three months
6 Within four to six months
7 Within six to twelve months/ one year
8 More than one year later
00 Other (record verbatim)
98 Don't know
99 Refused

E8A. Was the replacement another room air conditioner or a central AC system?
1. Room air conditioner
2. Central AC
8. (Don't know)
9. (Refused)

E8B. Was the replacement AC brand new or used?

1. Brand new
2. Used
8. (Don't know)
9. (Refused)

[ASK IF E8B=2, ELSE E8D]

E8C. How old is the replacement air conditioner?

[NUMERIC OPEN END RECORD IN YEARS]
0 (Less than one year)
98 (Don't know)
99 (Refused)

[ASK IF E8A=1, ELSE E8E]

E8D Is your replacement AC larger, smaller or the same size as the one it replaced?

1 Larger
2 Smaller
3 Same Size
98 Don't know
99 Refused

E8E Is it energy-efficient?

1. Yes
2. No
8. (Don't know)
9. (Refused)

E9 Can you provide me any more information about the replacement AC unit, such as the brand name and model number, size in tons, or any other characteristics?

[OPEN END: RECORD INFORMATION ON BRAND NAME, MODEL #, ETC.]
2. No
8. (Don't know)
9. (Refused)

Now let's get back to the room air conditioner that you had disposed of.

E10. When you first heard that ComEd would pick up an AC along with your other appliance, were you already considering getting rid of this room air conditioner? This could have been by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center.

1 Yes
2 No
98 Don't know
99 Refused

E11A If you had been unable to get rid of your AC through the ComEd appliance recycling program, would you have still gotten rid of the AC, or would you have kept it?

1 Gotten rid of it
2 Kept it
98 Don't know
99 Refused

[ASK E11b IF E11a = 1, ELSE F1]
E11b. If the ComEd program hadn't been available, would you have gotten rid of the AC within 6 months of when you did, within a year of when you did, or would it have taken longer than a year for you to get rid of this AC?

1. Within 6 months
2. Within a year
3. Over a year
8. (Don't know)
9. (Refused)

SECTION F: CONSIDERATION OF ALTERNATIVES SECTION

[ASK IF E11a=1 ELSE SKIP TO F3A]
F1 Now suppose that ComEd appliance recycling program hadn't been available. I am going to read a list of alternative ways that you could have disposed of this AC. Please tell me which one you would have been most likely to use to get rid of this AC. Would you have…
[ROTATE 1-4]

1. Sold it
2. Given it away for free
3. Taken it to a dump or recycling center
4. Hired someone to take it to a dump or recycling center
5. (Keep it)
00. (Other – Specify)
8. (Don't know)
9. (Refused)

[ASK IF F1=1, ELSE F1b]
F1a. Would you have sold the AC to a used appliance dealer or to a private party, either someone you know or by running an ad?

1. Sold it to a used appliance dealer
2. Sold it to a private party
8. (Don't know)
9. (Refused)

[ASK IF F1=2, ELSE F1c]
F1b. Would you have given the AC to someone you know or to a charity organization?

1. Given refrigerator to someone you know
2. Given to a charity organization
8. (Don't know)
9. (Refused)

[ASK IF F1=3, ELSE F2]

F1c. Would you have taken the AC to a dump or to a recycling center?

1. Dump
2. Recycling Center
8. (Don't know)
9. (Refused)

[ASK F3A THRU F3C IF E11a=2OR F1=5, OTHERWISE, SKIP TO F2]

F3A. You mentioned you would have kept this air conditioner if the ComEd appliance recycling program weren't available. If you had kept the AC, would you have used this AC or would you have stored it and not used it?

1 Used it
2 Stored it and not used it
3 (Both-store it and use it)
4 (Would not have kept it)
98 Don't know
99 Refused

[ASK IF F3A=1 or 3, ELSE F2]

F3B For how many years would you have used this AC? IF NEEDED: Your best estimate is fine.

[NUMERIC OPEN END]
77 (Until it broke, indefinitely)
0 (Less than 1 year)
98 Don't know
99 Refused

[ASK IF F3A=1 or 3]

F3C. Where would this AC have been located if you hadn't gotten rid of it and had used it? IF NEEDED, CLARIFY: What room?.

1. (Bedroom)
2. (Living room)
3. (Dining room)
4. (Kitchen)
5. (Hallway)
6. (Other)
8. (Don't know)
9. (Refused)

[ASK F2, F4, F5 of all AC participants]

F2 What was the condition of the AC when you signed up for the ComEd program? Would you say …

1 It worked and was in good physical condition
2 It worked but needed minor repairs
3 It worked but had some problems
4 (It wasn't working)

8 (Don't know)
9 (Refused)

F4. There may have been a number of reasons why you chose to get rid of the air conditioner that we've been discussing. Using a 0 to 10 scale where 0 is not at all important and 10 is extremely important, please tell me how important each reason was in your decision to get rid of it? [ROTATE]

a. The AC was expensive to run (0 to 10 Scale)
b. The AC was a spare that I did not use very much(0 to 10 Scale)
c. The AC was old and wasn't cooling the best anymore(0 to 10 Scale)
d. [SKIP IF E8D=2.3] I wanted a bigger AC unit or system(0 to 10 Scale)

F5. Were there any other reasons you chose to get rid of the AC?
[OPEN END]
96. (No)
98. (Don't know)
99. (Refused)

PROCESS QUESTIONS

[IF NO RECALL OF ANY APPLIANCE: TERMINATE]

Next I have some questions about your experiences with the ComEd Appliance Recycling Program.

G1. How did you first learn about the Appliance Recycling Program?
01. (Internet)
02. (Bill Insert)
03. (ComEd Energy at Home Newsletter)
04. (Friend/relative/neighbor)
05. (ComEd website)
06. (Radio)
07. (Newspaper)
08. (Municipal website or newsletter)
09. (ABT Electronics)
10. (Best Buy)
11. (Sears)
00. (Other____)
98. Don't know
99. Refused

G2. Since you first learned about the program, have you heard about the program from any other sources? If yes, where else? (Categories eliminated based on G1) [Select up to 5]
01. (Internet)
02. (Bill Insert)

03. (ComEd Energy at Home Newsletter)
04. (Friend/relative/neighbor)
05. (ComEd website)
06. (Radio)
07. (Newspaper)
08. (Municipal website or newsletter)
09. (ABT Electronics)
10. (Best Buy)
11. (Sears)
00. (Other____)
96. (No/No other sources)
98. Don't know
99. Refused

[Generate "retailer" variable = "ABT Electronics" if G1=09 or G2=09; "Best Buy" if G1=10 or G210; "Sears" if G1=11 or G2=11]

[SKIP IF <RETAILER>=0]
G2a. At <retailer>, how did you first hear about the program?
1. Store employee
2. Print or display materials (like a poster, flyer, or sticker)
00. Other (Specify)
98. Don't Know
99. Refused

G3. The appliance recycling program includes not only the pick-up service but also provides information. Did you receive information or learn that older refrigerators and freezers are less efficient and use more energy than newer ones, at the time you found out about the pick-up service?
1 (Yes, received information)
2 (No)
98 (Don't know)
99 (Refused)

G3aa. And did you learn that the refrigerator or freezer that is picked up by the program would be recycled, which means that the coolant in the unit would be safely removed and the materials that the unit is made of would be reused?
1 (Yes, received information)
2 (No)
98 (Don't know)
99 (Refused)

G3a. There are a number of ways you could have gotten rid of your appliance(s). What is the MAIN reason you chose the ComEd Appliance Recycling Program instead of some other way?
1. ($35/cash incentive)
2. (The convenience of the home pick-up)

3.(Don't have to take it someplace myself)
4. (Pick up was free)
5. (Appliance was recycled/Was disposed of in a way that was good for environment)
6. (Was recommended by friend/family)
7. (Was recommended by retailer)
00. (Other_specify)
96. (No other reason)
98. (Don't know)
99. (Refused)

G3b. Were there any other reasons? (Categories eliminated based on G3a) limit three?
1. ($35/cash incentive)
2. (The convenience of the home pick-up
3. (Don't have to take it someplace myself)
4. (Pick up was free)
5. (Appliance was recycled/Was disposed of in a way that was good for environment)
6. (Was recommended by friend/family)
7. (Was recommended by retailer)
00. (Other_specify)
96. (No other reason)
98. (Don't know)
99. (Refused)

G9. On a scale of 0 to 10 where 1 is very dissatisfied and 10 is very satisfied , how satisfied are you with the size of the payment you received as a result of your participation in the ComEd Appliance Recycling Program? [REPEAT SCALE IF NECESSARY]
0. 0
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. (Don't know)
12. (Refused)

(ASK IF G9=0,1,2,3, ELSE G10)
G9a. Why did you rate it that way?
(OPEN END)
(Don't know)
(Refused)

G10. How satisfied are you with the amount of time it took to receive your payment from ComEd? [REPEAT SCALE IF NECESSARY]

0. 0
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. Don't know
12. Refused

(ASK IF G10=0,1,2,3, ELSE G11)

G10a. Why did you rate it that way?

(OPEN END)
(Don't know)
(Refused)

G11. Thinking about your entire experience with the ComEd Appliance Recycling Program, overall, how satisfied are you with the service?
[REPEAT SCALE IF NECESSARY]

0. 0
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. Don't know
12. Refused

[ASK G11A IF G11 >= 5, ELSE G11B]
G11A. What aspects of the program did you particularly like? [Multiple Response accept up to 5] (NOTE to interviewer: If the respondent says "like all of it" or "entire program", record that response as 09 and probe for particular aspects)

01. (The service was easy)
02. (Didn't have to dispose of appliance myself)
03. (Like that appliance was recycled/helps the environment.)
04. (The incentive/$35 payment)
05. (Short wait between signing up and pick-up)
06. (Positive comment about pick-up team)
07. (It was free)
08. (Signing up online)
09. (Liked entire program)
00. (Other-specify)
96. (None of it/Didn't like any of it
98. Don't know/Not sure
99. Refused

[ASK G11B IF G11 <= 5, ELSE G12]
G11B. What aspects of the program did you particularly dislike?

[OPEN END]
(Don't know)
(Refused)

G12. This time, on a scale of 0 to 10 where 0 is "not at all likely" and 10 is "very likely," how likely are you to recommend the ComEd Appliance Recycling program to a friend or colleague?

0. 0

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. Don't know
12. Refused

(ASK IF G12=0,1,2,3, ELSE G16)
G12a. Why did you rate it that way?
(OPEN END)
(Don't know)
(Refused)

G16. Based on your participation in the ComEd Appliance Recycling Program, have you taken any additional actions to save energy in your home?
1. Yes
2. No
3. (Don't know)
4. (Refused)

[IF G16=1, THEN ASK, ELSE G17]
G16a. What actions have you taken?
(OPEN END)
98. (Don't know)
99. (Refused)

G16b. Since participating in the program, have you participated in any <u>other</u> ComEd energy efficiency programs?
1 Yes
2 No
8 (Don't know)
9 (Refused)

[ASK G16c IF G16b=1, ELSE G17]

G16c. What other programs have you participated in? [MULTIPLE RESPONSE; ROTATE]
1 Energy Audit or Home Assessment
2 Central AC program
3 Lighting Discounts or Energy Efficient Light bulbs
4 Hourly pricing program

5 (Fridge and Freezer Recycling Program – another unit)
00 (OPEN END)
98 (Don't know)
99 (Refused)

G17. Have you noticed a reduction in the amount of your electric bill since your [appliances were] [IF S1_READ=”one freezer” OR “one refrigerator” read: appliance was] removed?
1. Yes
2. No
3. Don’t know
4. Refused

I have just a few questions left for background purposes only.

H1. Do you own or rent your home?
1. Own
2. Rent
8. (Don’t Know)
9. (Refused)

[ASK IF H1=1]
H1a Do you own rental property that is leased to others?
1 (Yes, lease to others)
2 (No, don’t lease to others)
3 (Other, RECORD VERBATIM)
98 (Don’t know)
99 (Refused)

[ASK IF H1 = 2, ELSE H3]
H2. Do you pay your own electric bill or is it included in your rent?
1. Pay bill
2. Included in Rent
8. (Don’t Know)
9. (Refused)

H3. How many people live in your household year-round?
[NUMERIC OPEN END]
98. (Don’t Know)
99. (Refused)

H4. What is the age of the Head-of-the Household? (IF THE ROLE IS SHARED, PLEASE ASK THEM TO PROVIDE AN AVERAGE)
[NUMERIC OPEN END]
98. (Don’t Know)
99. (Refused)

H5. What is the approximate square footage of home that you live in?
[NUMERIC OPEN END]
99998. (Don't Know)
99999. (Refused)

[ASK H5a IF H5 = DK,ELSE H6]
H5a. Is it…
1. Less than 500 square feet
2. 500 to less than 1000 square feet
3. 1000 to less than 1500 square feet
4. 1500 to less than 2000 square feet
5. 2000 to less than 2500 square feet
6. 2500 to less than 3000 square feet
7. 3000 to less than 4000 square feet
8. 4000 to less than 5000 square feet
9. 5000 square feet or more
98. (Don't Know)
99. (Refused)

H6. How long have you lived at your current residence?
00. [RECORD YEARS/MONTHS GIVEN]
98. (Don't Know)
99. (Refused)

H6a. Was your total family income in 2010 before taxes UNDER OR OVER $50,000?
1. Under $50,000
2. Over $50,000
3. (Exactly $50,000)
8. (Don't know)
9. (Refused)

[ASK IF H6a=1, ELSE H6c]
H6b. Was it under $15,000, between $15,000 and $30,000 or between $30,000 and $50,000?
[INTERVIEWER NOTE: IF EXACTLY $30,000 ENTER AS '3. $30,000-$50,000']
1. Under $15,000
2. $15,000-$30,000
3. $30,000-$50,000
8. (Don't know)
9. (Refused)

[ASK IF H6a=2, ELSE H7]
H6c. Was it between $50,000 and $75,000 or between $75,000 and $100,000 or was it over $100,000?
[INTERVIEWER NOTE: IF EXACTLY $75,000 ENTER AS '2. $75,000-$100,000'. IF EXACTLY $100,000 ENTER AS '3. OVER $100,000']

1. $50,000-$75,000
2. $75,000-$100,000
3. Over $100,000
8. (Don’t know)
9. (Refused)

H7. What is the highest level of education you have completed?

1. Less than high school
2. High school graduate or equivalent (e.g., GED)
3. Attended some college (includes junior/community college)
4. Bachelors degree
5. Advanced degree
00. (Other, Specify)
98. (Don’t know)
99. (Refused)

5.1.2 ComEd Residential Appliance Recycling Participating Retailer Survey

ComEd Appliance Recycling
Participating Retailer Interview Guide

June 2011

[Note to Reviewer] The Interview Guide is a tool to guide process evaluation interviews with participating retailers. The guide helps to ensure the interviews include questions concerning the most important issues being investigated in this study. Follow-up questions are a normal part of these types of interviews. Therefore, there will be sets of questions that will be more fully explored with some individuals than with others. The depth of the exploration with any particular respondent will be guided by the role that individual played in the program's implementation, i.e., where they have significant experiences for meaningful responses. The interviews will be audio taped and transcribed.

Hello, my name is _____. I am calling from Opinion Dynamics on behalf of Commonwealth Edison, also known as ComEd. Teresa Rodriguez from JACO provided me with your contact information. As part of an annual evaluation of ComEd's Appliance Recycling Program we are speaking with retailers who participate in the program. Do you have ten to fifteen minutes to speak with me about your experiences in the program?

PROGRAM INVOLVMENT AND ROLES

1. To start, what is your job title? Could you describe to me what your role is at <RETAILER> with regard to ComEd's Appliance Recycling program?

2. As a participant in ComEd's Appliance Recycling program, what types of program activities are you involved in?

3. How many of your store locations participated in ComEd's Appliance Recycling program during Program Year 3 (which covered the past 12 months)?

4. How did <RETAILER> learn about the opportunity to participate in ComEd's Appliance Recycling Program? What made <RETAILER> decide you wanted to participate in the Appliance Recycling Program?

5. What do you see as the benefits to <RETAILER> stores of participating in the program?

MARKETING

6. How does <RETAILER> inform your customers about the Appliance Recycling Program? [probe for: point in sales process (sales floor vs. point-of-sale), interaction with customers, signage]

7. How often would you say sales teams inform potential refrigerator or freezer customers about the program?

8. Have you used any marketing materials provided by ComEd in your retail stores? If so, which ones? (Probe for: flyers, plexi stand display materials)

9. What types of sales messages do your salespeople use to highlight the appliance recycling opportunity to your customers? [probe for rebate/incentive vs. convenience vs. environmental benefit.] Do they ever mention the program in their sales messaging for customers that are for buying a new appliance?

10. What percentage of your refrigerator and freezer customers, would you say, dispose of an unwanted refrigerator or freezer through the ComEd program?

DISPOSAL SERVICES

11. In addition to the ComEd program, does <RETAILER> offer a pickup and disposal service for customers that purchase new refrigerators or freezers?
    1) If no: Did <RETAILER> offer another pickup and disposal service for customers before you began participating in the ComEd Program? (If yes, continue with disposal service in PAST TENSE; if no skip to Enrollment)
    2) What other choices do your salespeople give customers for disposing of their old appliance?
    3) Does your store provide information to customers seeking disposal services? [IF NEEDED: For example, do you hand out business cards of haulers or used appliance dealers?]
12. Who picks up the older units through <RETAILER>'s service? (Probe for their own staff or a third party hauler; if third party get company name).

13. Do you charge for this service or is it offered for free to customers?

14. What percent of your customers that purchase a new refrigerator or freezer would you estimate use your service?
    i. If retailer currently offers service: How has this changed since <RETAILER> started participating in the ComEd program? [Probe for percentage ComEd vs. other service]

15. Do you know what happens to the units that you/they pick up? (Probe for whether they are recycled, destroyed, or sent to used appliance market; probe for chance that units end up on used appliance market)

16. You just told me that ___% of customers use ComEd's program and ___% of customers use <RETAILER> program to dispose of unwanted refrigerators and freezers. Do you know what customers who DO NOT use these pickup and disposal services generally do with unwanted refrigerators and freezers? (Probe for: sell as used appliance, use as secondary unit, municipal/city program, leave on curb, hauler service)

ENROLLMENT

17. Can you describe how customers sign up for the program? [Probe for: point of sale; kiosk]

18. From your perspective, how smoothly does the sign-up process at your stores run?
    i. How easy or difficult do your staff find the online enrollment software to use?
    ii. How easy or difficult is the sign-up process from the customer perspective? (Probe for awareness vs. qualification vs. software challenges)

IMPLEMENTATION

19. What, if any, training do your sales teams receive about the program? Have you attended any of the trainings? If so: How useful do you think the trainings are in preparing staff to implement the program?

20. How are customer eligibility requirements for ComEd's program communicated to your sales team? Do you know if your sales staff communicate eligibility requirements to customers? If so, how?

21. How well do ComEd representatives keep you informed about the program? Do you receive all of the information you need about the program?

CUSTOMER AND GENERAL FEEDBACK

22. Have your salespeople reported any experiences (positive or negative) regarding feedback from customers about the program? What have they reported? (Probe for frequent questions, adequacy of incentive amount)

23. What are the strengths of the program? What are the weaknesses of the program? Do you have any recommendations for ways to improve the program? If so, what?

24. Do you have any other comments or questions about the program that you would like to share?

5.1.3 ComEd Residential Appliance Recycling Nonparticipating Retailer Survey

ComEd Appliance Recycling
Non-Participating Retailer Interview Guide

July 2011

[Note to Reviewer] The Interview Guide is a tool to guide process evaluation interviews with non-participating retailers. The guide helps to ensure the interviews include questions concerning the most important issues being investigated in this study. Follow-up questions are a normal part of these types of interviews. Therefore, there will be sets of questions that will be more fully explored with some individuals than with others. The depth of the exploration with any particular respondent will be guided by the role that individual plays in the company's appliance recycling/disposal operations, i.e., where they have significant experiences for meaningful responses.

Hello, my name is _____. I am calling from Opinion Dynamics on behalf of Commonwealth Edison, also known as ComEd. We are interested in speaking with retailers who do not currently participate in ComEd's Appliance Recycling Program. Just to confirm, do you participate in ComEd's Appliance Recycling Program?

a) Yes (terminate)
b) No

This study is being done as part of an annual evaluation of ComEd's Appliance Recycling Program. Do you have ten minutes to speak with me about refrigerator and freezer removal or recycling programs?

AWARENESS OF PROGRAM

1. Are you aware of ComEd's Appliance Recycling Program? Were you contacted at any point in the past to participate? (how else had they heard about it?)

2. [IF AWARE] Why have you not participated? Are there any changes ComEd could make to the program that would make you more likely to participate? What changes do you recommend?

3. Do your customers ask about the ComEd Appliance Recycling Program? Do they ask if you have a recycling program in general available?

CURRENT PRACTICES

4. Do you offer any kind of appliance removal or recycling option when customers purchase new appliances?

   [IF YES]

5. Could you describe how your removal program works? Who picks up the older units? (Probe for their own staff or a third party hauler; if third party, get company name). Are

there requirements of how they have to dispose of or recycle the appliances? What are those requirements?

6. Do you know what happens to the units that you/they pick up? (Probe for whether they are recycled, destroyed, or sent to used appliance market; probe for chance that units end up on used appliance market).
   c) Vary by age or condition of the appliance? (if so, how?)
   d) Vary by region? (if so, how? Why?)

7. Do you charge for this service or is it offered for free to customers?

8. What percent of your customers that purchase a new refrigerator or freezer would you estimate use your service?

[IF STORE DOES NOT OFFER REMOVAL OR RECYLING SERVICES]

9. Does your store provide information to customers seeking disposal services? [IF NEEDED: For example, do you hand out business cards of haulers or used appliance dealers?]

[IF AWARE OF PROGRAM]

10. Do you believe the ComEd Appliance Recycling Program (in general, and specifically ComEd ARP) has impacted the market for secondary fridges or freezers in the Chicago area? How so? [Probe: Has the program decreased the total number of used appliances available in the Chicago area? By how much? Seek a quantitative answer.]

GENERAL (needed?)

11. What is your position at <RETAILER>?

5.1.4 ComEd Residential Appliance Recycling Used Appliance Dealer/Hauler Survey

ComEd
Hauler Interview Guide

[Note to Reviewer] The Interview Guide is a tool to guide process evaluation interviews with appliance haulers. The guide helps to ensure the interviews include questions concerning the most important issues being investigated in this study. Follow-up questions are a normal part of these types of interviews. Therefore, there will be sets of questions that will be more fully explored with some individuals than with others. The depth of the exploration with any particular respondent will be guided by the role that individual play in the hauling operations, i.e., where they have significant experiences for meaningful responses. The goal of the interviews is learn about hauler disposal practices and to gauge whether owners/managers of these companies are noticing any change(s) to the secondary appliance market, as a result of consumers choosing to participate in ComEd's appliance recycling program.

Introduction

Hello, my name is _____. I am calling from Opinion Dynamics on behalf of Commonwealth Edison, also known as ComEd. As part of an annual evaluation of ComEd's Appliance Recycling Program we are speaking with appliance haulers in the area. [IF RECOMMENDED BY RETAILER, MENTION WHICH STORE REFERRED]

Just to confirm, does your company currently offer residential hauling services for household appliances such as refrigerators and freezers in the greater Chicago area? (Confirm, not just scrap metal/junk)

1. Yes
2. No (Terminate)

The questions that I have will take less than 10 minutes and your responses will be kept strictly confidential. Is this a good time to talk? [IF NO, SCHEDULE A CALL BACK.]

General/screening

1. (IF NOT REFERRED BY RETAILER) Do you have specific contracts with any retailers to haul old appliances when a customer purchases a new one at the store?
   (IF REFERRED BY RETAILER) Do you have contracts with any other retailers in the area besides <name of store referred by>?

2. (IF HAVE CONTRACT WITH A RETAILER) What percent of your appliance hauling comes through [specific retailer(s)] vs. general pickups?

3. What percent of the appliances that you pick up are because customers have purchased a new fridge or freezer, and are getting rid of the one they had been using as their primary appliance, vs. removing an older, secondary refrigerator?

Disposal practices

4. Could you describe your general disposal policy or policies? Recycle, discard at land fill, or feed into secondary market?
   a) Does this vary by age or condition of the appliance? (if so, how?)
   b) Does this vary by retailer pickups vs. general pickups? (if so, how?)
   c) Does this vary by region? (if so, how? Why?)

5. (IF HAVE CONTRACT WITH A RETAILER AND NOT SPECIFIED IN Q4) Does your contract with <store > specify how the refrigerators need to be disposed?
   If so, can you tell me generally what the requirements are?

Number and Condition of Appliances Disposed Of

6. How many refrigerators do you pick up in a typical a year?

7. How many freezers do you pick up in a typical a year?

8. Have you noticed any change in the number of refrigerators and freezers that your company is picking up in the last two years? Has it increased, decreased, or stayed the same?
   a) [IF INCREASED OR DECREASED] By what percent has it increased/decreased?
   b) [IF INCREASED OR DECREASED] Why do you think this is?

9. What condition are these units in? What percentage are:
   a) Still working well
   b) Working but with significant problems
   c) Not working

Awareness and impact of the ARP

10. Are you aware of the Residential Appliance Recycling Program offered by ComEd? [Note: Also offered by Ameren IL]

11. Do you believe ARP has impacted the market for secondary refrigerators in the Chicago area? How so? By how much?
    [Probe: Has the program decreased the total number of used appliances available in the Chicago area? Seek a quantitative answer.]

Thank you for your time today.

5.1.5 Room Air Conditioner Deemed Savings Review

Room Air Conditioners. The energy consumption of residential HVAC can be estimated using the following equation.

$$kWh = \text{unit capacity} \times \text{load} \times FLEH / (\text{efficiency} \times 1000)$$

where:

- unit capacity [BTU/h] is a nameplate value
- load [dimensionless] is assumed to be 1.0 with partial loading accounted for in FLEH
- FLEH (full-load equivalent hours) [hours] is basically the compressor run-time if we assume window AC units are generally a two-state device – on or off.
- Efficiency [Btu out / Watts in] or EER for equipment of this type
- 1000 is the conversion factor from Watts to kW

Assumptions. The program documentation assumes savings of 80 kWh annually and 0.04 of peak kW. DOE-2 modeling is listed as the source of these savings estimates.

Results. We propose to estimate recycled AC unit savings using the algorithm stated above. Required data will be obtained from multiple sources including tracking data, phone surveys, and professional judgment.

The program is collecting data on capacity, but we must make judgments on the FLEH and unit efficiency. We can use other tracking data as proxies for these factors.

Full-Load Equivalent Hours. For FLEH our estimate will be based on whether the machine is the primary or secondary cooling system in a house. This information will be gathered via the phone surveys of participants. In the residential HVAC programs ComEd is assuming approximately 750 FLEH for central AC equipment as a primary system. Secondary systems would have fewer hours.

Unit Efficiency/SEER. For unit efficiency, we can use age as a proxy for estimating efficiency. New equipment will have higher efficiency with the newest equivalent to the current code minimum about 9.7 EER for most window units. Older equipment will have degraded efficiency due to age and more lax minimum efficiency standards in the past.

The following values can be used in the consumption algorithm for the removed appliance:

FLEH	
Primary	750
Secondary	350
Unknown	150

Efficiency/SEER vs. Age	
Since 2000	9.7
1990 – 1999	8.5
1980 – 1989	7.5
1970 – 1979	6.8
Pre 1970	6.0

Savings depends on the status of site cooling after the unit is removed. In all cases we would assume same capacity replacements. We propose the following assumptions for site cooling after a window AC unit is replaced.

- *If it is a primary unit removed, we assume it will be replaced by central AC with a minimum efficiency of 13.0 SEER or another window unit with a minimum efficiency of 9.7 EER running for 750 FLEH.*
- *If it is a secondary unit removed it will be replaced by central AC with a minimum efficiency of 13.0 SEER and 750 FLEH or another window unit with a minimum efficiency of 9.7 EER running for 350 FLEH.*
- Undefined systems will be replaced by a 9.7 EER window unit operating 150 hours.