

Energy Efficiency / Demand Response Plan: Plan Year 2 (6/1/2009-5/31/2010)

Evaluation Report: All-Electric Efficiency Upgrade Program

Presented to

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Section E. Executive Summary

E.1 Evaluation Objectives

This report summarizes the findings and results from the evaluation of Program Year 2 (PY2) of the All-Electric Efficiency Upgrade program.¹ This program has three major elements:

- Direct installation of low-cost replacement measures: CFLs, faucet aerators and low-flow showerheads;
- An energy audit of common areas; and
- Recommendations for HVAC and lighting measures eligible for incentives through the Smart Ideas for Your Business Prescriptive program.

The target markets are the property owners and managers of all-electric multifamily residential facilities with both electric heat and hot water and their tenants.

The primary objectives of this evaluation are to quantify gross and net savings impacts from the program for PY2 and to determine key process-related program strengths and weaknesses and identify ways in which the program can be improved.

E.2 Evaluation Methods

Table E-1 provides a summary of the data collection activities conducted as part of this evaluation. Primary data collection activity for this evaluation included in-depth interviews with program management and implementation staff, supplemented by a telephone survey of participating residents and building owners and managers.

¹ Program Year 2 began June 1, 2009 and ended May 31, 2010.

Table E- 1. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
Tracking Data	Program Participants	Tracking Database	-	All	Ongoing
In-Depth Phone Interviews	ComEd All-Electric Efficiency Upgrade Program Manager	Contact from ComEd	Multifamily Program Manager	1	June 2010
	Honeywell Program Manager	Contact from Honeywell	Honeywell Program Manager	1	June 2010
CATI Phone Surveys	ComEd Participating Customers	Participants	Random sample	75	September 2010
	ComEd Participating Building Owners/Managers	Managers/ Owners participating buildings	Attempted census	10	September 2010

E.3 Key Findings

Key Impact Findings

A total of 4,219 tenant spaces received direct installation of at least one efficiency measure through the program. Rebates and energy savings for recommended measures installed in common areas will be evaluated separately within the Business Custom or Prescriptive programs. Table E-2 below provides the PY2 program gross and net goals and accomplishments. The program tracking system provided PY2 energy saving impacts based on PY1 ComEd default impact values. ComEd proposed new default values and methodologies for PY2 and the evaluation team responded with recommended alternative values in January 2010, as documented in Appendix 5.2. ComEd agreed to revise their defaults to the evaluation-recommended values. The program reported ex ante impacts are based on the use of tracking system reported installed measure counts, and ComEd’s PY2 revised default savings values and methodologies.

Table E-2 and Table E-3Table 3-12. First Year *Ex-Post* Program Peak Demand Impact by Measure, PY2 below summarize the PY2 gross and impacts for the All-Electric Efficiency Upgrade Program. The overall gross impact realization rate (RR) is 77% for energy savings and 78% for demand savings.

Table E- 2. PY2 All-Electric Efficiency Upgrade Gross and Net Impacts

Measure	Total Ex Ante Gross kWh	kWh RR	Total Ex Post Gross kWh	NTG Ratio	Total Ex Post Net kWh
13W CFL	52,021	96%	49,940	81%	40,452
15W CFL	128,371	96%	123,236	81%	99,821
20W CFL	762,011	96%	731,531	81%	592,540
CFL (unspec.)	4,089	96%	3,925	81%	3,180
Showerhead	1,015,146	70%	710,602	93%	660,860
Kitchen aerator	410,319	64%	262,604	94%	246,848
Bath aerator	325,952	64%	208,609	94%	196,093
Total	2,697,909	77%	2,090,448	88%	1,839,793

Source: Navigant Analysis of Program Tracking Data. ComEd PY2 revised default values and methodology derived from Navigant Memorandum "PY2 Default Savings Review for the All Electric Efficiency Upgrade Program," dated January 29, 2010. For program reporting, ComEd revised their tracking system default values to the evaluation-adjusted default values.

Measure	Total Ex Ante kW	kW RR	Total Ex Post Gross kW	NTG Ratio	Total Ex Post Net kW
13W CFL	5	96%	5	81%	4
15W CFL	12	96%	11	81%	9
20W CFL	68	96%	65	81%	53
CFL (unspec.)	0	96%	0	81%	0
Showerhead	51	70%	36	93%	33
Kitchen aerator	42	64%	27	94%	25
Bath aerator	44	64%	28	94%	26
Total	223	78%	173	87%	151

For CFL measures, a minor adjustment to reduce energy and demand impacts was made based on analysis of participant survey questions that addressed removal of installed CFLs, program CFLs that were not actually installed, program CFLs that replaced existing CFLs, and program CFLs that were placed into storage instead of installed. Three adjustments were made to water savings measures that resulted in a significant reduction to ex post gross impacts. The first adjustment was due to evaluation adjustment to default ex ante per unit impact assumptions

and algorithms. A second adjustment accounted for survey-based adjustments for removal, non-installation, and storage of water savings measures. Finally, the participant survey found significantly lower occupancy in residential units than assumed in the ex ante default assumptions. The survey ex post occupancy rate was 1.66 occupants per residence, compared with 2.35 occupants per dwelling unit in the ex ante assumptions. We recommend that the implementer collect occupancy information in PY3, and that ComEd adjust the PY3 default per unit values for water savings measures.

As described in the report below, some building owners are following-up on the common area assessment to install specific recommended measures. If the building owner pursues those measures through the Business Prescriptive program, those savings will be reported and evaluated in that program. Three building owners indicated they installed common area measures as a result of the common area assessment, but did not indicate applying for a Business Prescriptive rebate. The energy savings for these non-rebated common area measures are potentially significant additions to All Electric program impacts. The PY3 evaluation will attempt to quantify non-rebated program-induced common area impacts.

In addition, the evaluation team also recommends the program tracking data receive periodic data quality reviews and clean up, and that data entry include checks for values outside of limits. Data exported for the evaluation team should also be checked for anomalies.

Key Process Findings

The implementation of ComEd's All-Electric Efficiency Upgrade Program in PY2 is very similar to PY1. The program has made some adjustments to its eligibility and promotional focus to ensure high participation and that it meets its goals.

The direct installation of energy savings measures is effective. Nearly all participating residents have all of the measures installed. The installation rate ranged from 87% for low flow showerheads to 98% for CFLs.

The program's common area assessment is less effective at capturing potential energy savings from participating buildings, as the building owner must take the initiative to seek out installation assistance. Eight of the ten building owners and managers interviewed remember receiving an assessment of their building's common areas with energy saving recommendations, but only four remembered specific common area lighting measures that were recommended by the program. Of the four respondents that recalled receiving specific common area lighting measure recommendations, three reported that they have implemented the recommendations since the visit. Only one building owner reported that he had received a rebate for the installation of lighting measures identified in the common area assessment.



Satisfaction with all elements of the program is very high for both residents and building owners and managers. On a satisfaction scale of 0 to 10, with 0 meaning not at all satisfied and 10 meaning very satisfied, residents and building owners/managers give average ratings of 8.5 and 9.3, respectively, for the program overall.

Section 1. Introduction to the Program

1.1 Program Description

ComEd's All-Electric Efficiency Upgrade Program targets multifamily buildings with both electric heat and hot water and provides site visits to improve the building's energy efficiency. These site visits consist of two major elements:

- Apartment Walkthrough Assessment – Energy specialists contracted by ComEd conduct a walkthrough assessment of each unit in the building and install high efficiency measures where possible. Replacement measures include compact fluorescent light (CFL) bulbs, low-flow showerheads, and faucet aerators. The energy specialist also provides the tenant with a write-up of the measures installed and information regarding energy efficiency.
- Common Area Assessment – Energy specialists also conduct an energy audit of the building's common areas to identify potential energy savings. The building manager or property owner is then given a report of recommended improvements and information regarding possible rebates through ComEd's Business Custom or Prescriptive programs.

The All-Electric Efficiency Upgrade program launched in June 2008 and just completed PY2. The second program year runs from June 1, 2009 to May 31, 2010.

The multifamily buildings may be landlord-tenant apartment buildings or resident-owned condominiums in multi-unit buildings. In this report, individual dwelling units are referred to as residences or residential units, and in some contexts, as "home." In summary tables and results discussion, dwelling unit occupants are generally referred to as "tenants," even when condominium owners are included.

The Program operated under a revised PY2 planning target of 1,782 MWh net energy savings, which equates to 2,475 MWh gross energy savings at an 80% net-to-gross ratio planning assumption that was used for PY2.

Implementation Strategy

Roles of the Implementation Contractor

As was the case in PY1, ComEd contracted Honeywell Utility Solutions to implement the All-Electric Efficiency Upgrade Program. The firm has implemented similar programs in other states and drew upon that experience to create the operating procedures for ComEd's program.



Administration of the All-Electric Efficiency Upgrade program has not changed significantly from PY1. Most significantly, the ComEd program manager changed from PY1 to PY2 and a permanent Honeywell manager was hired for the ComEd service territory.

Several staff members are tied to the program. Honeywell utilizes a regional manager, a program manager, an account/customer service representative and energy specialists in the field. Honeywell created an operating manual for its staff that describes the program and proper procedures for interacting with customers and installing equipment.

Program Delivery Mechanisms and Marketing Strategy

The All-Electric Efficiency Upgrade Program is primarily delivered through the implementer, Honeywell Utility Solutions. The program targets multifamily buildings with electric heat and electric hot water. Honeywell identifies and targets specific buildings that qualify. The program works from a list of 174,000 accounts² coded as “all-electric.” However, in practice, many of these buildings have gas or oil central hot water heaters and therefore do not qualify.

The Honeywell staff has found that the easiest way to identify potential participant buildings is to have staff perform a spot check on buildings to see if it has a gas hook-up. If not, the staff will find the contact information of the management office and confirm the heat and hot water fuel type. The staff then contacts these buildings over the phone and with follow-up faxes that describe the program. Multiple contact attempts and personal attention are often required to convince the building manager or owner to participate.

The marketing and promotion of the All-Electric Efficiency Upgrade program is shared between Honeywell and ComEd. Honeywell is responsible for nearly all of the marketing. ComEd will occasionally promote the program through an article in the Energy at Work newsletter for businesses. This occurs approximately two to three times per year.

Honeywell also promotes the program to tenants. This is done through posters in the common area and flyers alerting tenants of the date of the unit walk through assessments. The program has considered marketing directly to tenants through bill stuffers or similar materials, but has not done this because tenants are not the decision makers for the residence.

Because the program targets only a small subset of buildings in the service territory, it does not invest in an extensive marketing campaign. Instead, Honeywell targets specific eligible buildings as described above and then directly contacts the building owner or manager.

² This is the number of multifamily electric space heating accounts. The actual number of buildings is smaller because most multifamily buildings individually meter each unit.

Measures and Incentives

As part of the apartment walkthrough assessment, the implementer may install any combination of four types of measures:

- Up to 6 CFLs (3 types offered: 13W, 15W, and 20W)
- Swivel kitchen faucet aerators
- Bathroom faucet aerators
- Low flow showerheads (fixed or handheld)

Residents may not have the measures installed if they already have similar energy efficient equipment installed or for aesthetic reasons such as not liking the quality of lighting or for the measure not matching existing plumbing hardware. This was very rare, however, as the vast majority of participants had the measures installed. The installation rate ranged from 87% for low flow showerheads to 98% for CFLs.

As part of the common area assessment, the energy specialist identifies potential lighting upgrades eligible for incentives through ComEd's Smart Ideas for your Business program. The building owner must contact the Business program to receive incentives for eligible measures.

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?
3. Did the program meet its energy and demand savings goals? If not, why not?

Process questions:

1. Has the program design changed from the plan filed on November 15, 2007? If so, how, why, and was this an advantageous change?
2. Is implementation on track and meeting goals? Has the program been implemented in a manner consistent with program design?
3. How effective are program implementation, design and process, and marketing efforts?
4. How satisfied are customers (tenants and owner/managers) with the program?

Section 2. Evaluation Methods

This section describes the analytic methods and data collection activities implemented as part of the PY2 process and impact evaluation of the All-Electric Efficiency Upgrade program, including the data sources used for the data collection activities.

2.1 *Analytical Methods*

2.1.1 **Impact Evaluation Methods**

Gross Program Savings

As part of the impact assessment for the All Electric Efficiency Upgrade Program, the evaluation team performed a mid-stream assessment of the program default measure impact calculations and algorithms. This review was completed in the middle of the program cycle, in January of 2010, and reported to program staff. The purpose of the default impact claim review was to assess the underlying algorithms, assumptions, and calculated default savings proposed by ComEd for the All-Electric Efficiency Upgrade Program in PY2. In the review the evaluation team utilized a number of secondary data sources, including census data and publicly available research and evaluation reports. Details of this review are presented in Appendix 5.2.

The impact evaluation also includes several other components. The first of which is a review of the program tracking system for completeness and accuracy. The second is a summary of program ex-ante gross impact accomplishments based on analysis of the tracking system. The third and final component of the gross impact study is a refinement and 'true-up' of the ex-ante impact values. This component of the impact study involves integrating program tracking system data and participant telephone survey data to refine gross impact estimates. More specifically, the evaluation team used these data to refine the following elements relating to the gross impact of the direct install measures:

- Measure installation rate
- First year measure persistence
- Residence occupancy
- Partial retrofit adjustment (for water saving measures only)

The evaluation used telephone survey results to identify participants (owners or tenants) that had installed measures outside of the direct installation component as a result of the program's energy saving recommendations. As part of the ex-post gross impact analysis, the evaluation estimated the savings associated with measure recommendation uptake.

All relevant details, algorithms, and results are presented in *Section 3.1 Impact Results*.

Net Program Impact

The primary objective of the net savings analysis for the 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. After gross program impacts are adjusted, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio. The NTG ratio quantifies the percentage of the gross program impacts that are attributable to the program. This includes an adjustment for free ridership (the portion of impact that would have occurred even without the program) and spillover (the portion of impact that occurred outside of the program, but would not have occurred in the absence of the program). The evaluation used a customer self-report method to estimate the NTG ratio, using data gathered during participant phone surveys.

2.1.2 Process Evaluation Methods

The process evaluation primarily makes use of in-depth interviews with program staff and quantitative analysis of interviews conducted with participating building managers and residents. Details on these surveys are described in more detail in the next section.

2.2 PY2 Data Collection Activities

The data collected for the evaluation of the PY2 All-Electric Efficiency Upgrade program was gathered from a variety of sources including in-depth interviews with ComEd program staff, Honeywell program implementers, Computer Assisted Telephone Interviews (CATI) with participating building managers and tenants, and ComEd tracking data analysis. Table 2-1 provides a summary of these data collection activities including the target population, sample frame, and timing.

Table 2-1. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
Tracking Data	Program Participants	Tracking Database	-	All	Ongoing
In-Depth Phone Interviews	ComEd All-Electric Efficiency Upgrade Program Manager	Contact from ComEd	Multifamily Program Manager	1	June 2010
	Honeywell Program Manager	Contact from Honeywell	Honeywell Program Manager	1	June 2010
CATI Phone Surveys	ComEd Participating Customers	Participants	Random sample	75	September 2010
	ComEd Participating Building Owners/Managers	Managers/ Owners participating buildings	Attempted census	10	September 2010

Source: Navigant Evaluation Team

2.3 Data Sources

2.3.1 Tracking Data

The tracking data used in this evaluation came from three databases:

- Program Tracking Database - This database was the primary program database and contained a record for all 57,943 measures installed in PY1 and PY2 with premise information (such as project ID, premise ID, address and installed appliances) and measure details (such as quantity and energy savings). Also included in the database was information from the common area audit for 406 measures and results from the leave behind survey.
- Multifamily Unit Database - This database contained the names and contact information for all of the participants of the multifamily program.
- Multifamily Properties Database - This database contained a record for each building participating in the multifamily program in PY2, including property name, property address and type of complex.

2.3.2 Program and Implementer Staff Interviews

The evaluation team conducted two in-depth interviews with program staff as part of this evaluation. One of these interviews was conducted with the current and previous ComEd Program Managers and one with the Honeywell Implementation Manager. These interviews were completed over the phone in June 2010. Both interviews focused on changes to the program from PY1 to PY2 and perceived effectiveness of the program. The interview guides used for these interviews are included in Appendix 5-1.

2.3.3 Participant Interviews

Sampling Plan

The sample used for the participating resident survey was pulled from the program tracking database provided to the evaluation team by ComEd. This database contained 57,943 records, one for each measure installed in PY1 and PY2. All records from PY1 or with missing or invalid phone numbers were removed from the sample (they were used in the calculations for the final impact results). The database was then aggregated so that the sampling unit was the unique residence giving us 2,284 participants in the sampling frame for random selection.

The sample used for the building owner/manager survey was provided by ComEd. It contained information on the 60 buildings participating in PY2, of which 42 had unique contacts. We attempted to survey a census of the building owners/managers.

Survey Disposition

Table 2-2 below shows the final disposition of the survey of participating tenants and building owners/managers. As this table shows, we attempted to contact 77% of the tenant sample, which resulted in 75 survey completes. We completed the desired number of surveys before the remaining 23% were contacted. The survey center was unable to make contact with 43% of customers in the sample for a variety of reasons including no one answering the phone, an answering machine picking up, or the phone line was busy. The phone numbers provided for 19% of the sample had problems such as being disconnected, blocked, an incorrect number, or a cell phone number³. The survey center reached 30 households that were either non-English speaking or had another language or communication barrier that prevented the household from participating in the survey. The final response rate was 6%.

³ Some customers were reached on their cell phones and chose not to complete the survey.

We attempted to contact all building owners and managers resulting in 10 completed surveys. The survey center was unable to make contact with 43% of owners/managers and 7% had a phone number issue.

Table 2-2. General Population Survey Call Disposition

Call Disposition	Tenants	%	Building Owners/ Managers	%
Sample Pulled	2,284	100%	42	100%
Completes	75	3%	10	24%
Not Dialed	527	23%	0	0%
Refusal	97	4%	7	17%
Unable to Reach	993	43%	18	43%
Language Barrier	30	1%	0	0%
Phone Number Issue	428	19%	3	7%
Appointment Scheduled	116	5%	4	10%
Other	18	1%	0	0%

Source: Navigant Evaluation Team Analysis of Survey Data

Table 2-3 below shows the final disposition of the survey of participating rental apartments and owner-occupied condominium residents.

Table 2-3. PY2 Telephone Survey Composition & Distribution

Total	Number	Apartments	Condos
PY2 population with Premise ID and Project ID	2,566	87%	13%
Completed surveys	75	71%	29%

Source: Project tracking database

Sampling Error

There were 75 completions among the 4,219 tenant residences, although not all had all three measures installed. By measure, the number of completions was somewhat lower after removing respondents who were unable to provide detailed responses to gross impact and net

questions. The population sampling error at a 90% confidence interval is provided in Table 2-4 below:

Table 2-4. PY2 Sample Size and Population Level Sampling Error

Measure	Population Size (N)	Sample Size (n)	Sampling Error (90% CI)
CFL	3,870	59	10.6%
Low Flow Showerheads	3,418	57	10.8%
Faucet Aerators	4,211	63	10.3%
All Tenants	4,219	75	9.4%

Section 3. Program Level Results

This section presents the results of the impact and process evaluations of the All-Electric Efficiency Upgrade program.

3.1 Impact Results

3.1.1 Tracking System Review

The gross tracking data for PY2 contained 29,203 entries. Each entry corresponded to a measure type that was newly installed, previously installed, not present, or refused by the customer. There were a total of 4219 Workorder IDs corresponding to different sites where the 29,203 measure entries were located.

- 476 entries had either a 0 or blank Premise ID (although no Workorder IDs were blank). The evaluation team has noted that this could be a data export problem and will attempt to address this issue in subsequent evaluations.
- 24 entries corresponding to 4 Workorder IDs did not have installation dates.
- 87 entries contained CFL measures with unspecified wattage inputs. The energy savings for all of these occurrences was listed as 44 kWh per bulb, which matches the default energy savings used in PY1 for a 20W CFL replacing a 75W incandescent. For these cases, we assumed a 75 watt incandescent to 20 watt CFL conversion, which is the most common retrofit in the program.

After cleaning the data for the errors described above, we created an Excel spreadsheet of the direct installation measures to analyze the tracking savings by measure type.

3.1.2 Ex-Ante Gross Impact

The distribution of program reported measures installed during PY2 is provided in Table 3-1 through Table 3-4 below for CFLs, showerheads, and aerators.

Table 3-1. Distribution of Program-Reported Installed CFLs

Quantity/ Residence	Program Total CFL 13W (40W)	Installed %	Program Total CFL 15W (60W)	Installed %	Program Total CFL 20W (75W)	Installed %	Program Total CFL Unspecified	Installed %	Total CFL
1	73	3%	107	3%	151	1%	1	1%	332
2	138	6%	170	5%	838	5%	2	2%	1,148
3	192	9%	657	20%	912	6%	6	7%	1,767
4	640	28%	848	25%	604	4%	0	0%	2,092
5	230	10%	295	9%	960	6%	0	0%	1,485
6	972	43%	1,266	38%	12,726	78%	78	90%	15,042
7	7	0%	0	0%	14	0%	0	0%	21
8	0	0%	0	0%	8	0%	0	0%	8
Program Total	2,252	100%	3,343	100%	16,213	100%	87	100%	21,895

Source: Navigant analysis of program tracking database

**Table 3-2. Distribution of Reported Installed Showerheads
(includes both low-flow and handheld)**

Quantity/Residence	Program Total	Installed%
1	2,698	65%
2	1,436	35%
3	3	0%
7	7	0%
Program Total	4,144	100%

Source: Navigant analysis of program tracking database

Table 3-3. Distribution of Reported Installed Bathroom Aerators

Quantity/Residence	Program Total	Installed %
1	2,557	52%
2	2,250	46%
3	60	1%
4	4	0%
5	5	0%
Program Total	4,876	100%

Source: Navigant analysis of program tracking database

Table 3-4. Distribution of Reported Installed Kitchen Aerators

Quantity/Residence	Program Total	Installed %
1	3,504	100%
2	6	~0%
Program Total	3,510	100%

Source: Navigant analysis of program tracking database

The program reports that a total of 4,219 residential units received direct installation of at least one efficiency measure through the program. The program tracking system provided energy saving impacts based on PY1 ComEd methodologies. However, ComEd proposed new default values and methodologies for PY2, shown in a memorandum from Navigant dated January 29, 2010. The program reported ex ante impacts are based on the use of tracking system reported installed measure counts, and ComEd’s PY2 revised default values and methodologies, which ComEd set to equal the evaluation-recommended default values. ComEd’s proposed and revised PY2 default values are documented in Appendix 5.2. Ex-ante impact assumptions and program tracking data indicate total program ex-ante gross energy impact of 2,698 MWh, with demand impact of 0.223 MW. Ex-ante savings are based solely on the direct installed measures. Table 3-5 below summarizes the program reported ex ante impact for each installed measure.

Table 3-5. First Year Ex-Ante Program Reported Impact by Measure, PY2 Accomplishments

Measure	Measure impact unit	Reported Installed Units	kWh/unit	Total Ex Ante kWh	Peak kW/unit	Total Ex Ante Peak kW
13W CFL replacing 40W incandescent	Lamp	2,252	23.1	52,021	0.0021	5
15W CFL replacing 60W incandescent	Lamp	3,343	38.4	128,371	0.0035	12
20W CFL replacing 75W incandescent	Lamp	16,213	47.0	762,011	0.0042	68
CFL (unspecified)	Lamp	87	47.0	4,089	0.0042	0
2.0 GPM low flow showerhead	Residence	3,418	297.0	1,015,146	0.0150	51
1.5 GPM kitchen faucet aerator	Residence	3,507	117.0	410,319	0.0120	42
1.5 GPM bath faucet aerator	Residence	3,704	88.0	325,952	0.0120	44
Total				2,697,909		223

Source: Navigant analysis of program tracking database

Ex-ante gross impacts for CFLs are based on the number of CFL bulbs installed and the delta wattage of each bulb. Impacts for the showerheads and aerator measures are applied on a per-residence basis. Per unit impacts are provided in Appendix 5.2

3.1.3 Ex-Post Gross Impact

This section summarizes the PY2 ex-post impact estimation approach and results for the All-Electric Efficiency Upgrade Program. More specifically, this section addresses the following adjustments to ex-ante impact values:

- Adjustments for consistency with ex ante default per unit impact assumptions
- Adjustments for measure disposition (removals and failures)
- Adjustments for partial retrofits (water saving measures)
- Adjustments for residence occupancy

Adjustments for Ex Ante Default Per Unit Impact Assumptions

The calculation of ex post gross impact includes an evaluation adjustment to the ex ante default per unit savings assumptions. The evaluation team performed a mid-stream assessment of the program default measure impact calculations and algorithms. This review was completed in the middle of the program cycle, in January of 2010, and reported to program staff. The purpose of the default impact claim review conducted in January was to assess the underlying algorithms, assumptions, and calculated default savings proposed by ComEd for the All-Electric Efficiency Upgrade Program in PY2. The review utilized a number of secondary data sources, including census data and publicly available research and evaluation reports. Details of this review are presented in Appendix 5.2.

Evaluation adjustments to sample point impacts based on consistency with default baseline and operating assumptions were considered based on responses to the PY2 participant survey:

- The program guidelines require CFLs be installed in locations that operate 2 or more hours per day. Of the 59 participants in the CFL sample disposition (described below), 55 indicated that the CFLs were installed in locations that operate 2 or more hours per day, while the remainder said “no” or did not know. The default savings assumes 2.34 hours per day (based on research of participant-selected installation location). Given that 93% of respondents report operating hours greater than 2 hours per day, no reduction to the hours of use assumption was made based on these survey responses.
- The program guidelines require that CFLs be installed in locations that replace an incandescent or halogen lamp. Of the 59 participants in the CFL sample disposition (described below), 46 indicated that the CFLs were installed in locations that replaced and incandescent or halogen, 6 reported that they replaced “regular” light bulbs (assumed to be incandescent), 3 mentioned or described a CFL or fluorescent base lamp, and while the remainder said “no” or did not know. Two of the respondents claiming CFLs as a baseline could not identify the number of baseline CFLs involved, so their responses were not used to adjust results. One respondent specifically identified CFLs as

a baseline for 4 of the 6 CFLs installed in that residence. Instances of efficient baseline equipment are accounted for through the net-to-gross ratio.

- The evaluation team reviewed the survey responses for question HC15 (how long is the average shower taken in your home) of the tenant survey. According to the survey responses, 13 were left blank and 8 either didn't know or refused to answer. The evaluation team derived an average shower length of 11.2 minutes from the sample survey. The ex ante impacts are based on a shower length of 8.2 minutes. The value of 8.2 minutes was based on a 1999 research study that examined where water is used in single-family homes in North America using extensive data logging. The evaluation team also reviewed the survey responses for question HC16 (all combined showers that you and your family members take each week) of the tenant survey. According to the survey responses, 13 were left blank and 10 respondents either didn't know how many showers were taken at the residence or refused to answer. The remaining responses ranged from zero showers per week to 28 showers per week per living unit with an average of 9.6 showers per week per living unit, or 0.84 showers per capita per day. The ex ante impacts are based on 0.70 showers per capita per day. The evaluation team chose to retain the ex ante default values for the calculation of showering water use on the basis that the shower use derived in the default savings analysis (Section 5.2) is more reliable than the self-reported data of HC15 and HC16.

Table 3-6 below summarizes the ComEd's PY2 proposed ex ante default per unit impact for each installed measure, and the evaluation-adjusted ex ante default impact. For PY2 program reporting, ComEd set their revised ex ante default values to equal the evaluation-adjusted default values.

Table 3-6. ComEd Proposed, Revised, and Evaluation Adjusted First Year *Ex-Ante* Program Default Impacts by Measure

Measure	Measure Impact Unit	ComEd Proposed Ex Ante kWh/unit	ComEd Revised and Evaluation Adjusted Ex Ante kWh/unit	ComEd Revised and Evaluation Adjusted Ex Ante Peak kW/unit
13W CFL replacing 40W incandescent	Lamp	23.1	23.1	0.0021
15W CFL replacing 60W incandescent	Lamp	38.4	38.4	0.0035
20W CFL replacing 75W incandescent	Lamp	47.0	47.0	0.0042
CFL (unspecified)	Lamp	47.0	47.0	0.0042
2.0 GPM low flow showerhead	Residence	355.0	297.0	0.0150
1.5 GPM kitchen faucet aerator	Residence	145.0	117.0	0.0120
1.5 GPM bath faucet aerator	Residence	83.0	88.0	0.0120

Source: Navigant analysis of program tracking database

Adjustments for Measure Disposition

The calculation of ex-post gross impact includes an adjustment to reflect the removal of program measures. For each installation recorded in the tracking system, phone survey respondents were asked to confirm the total number of installed measures, and to note the number of installed measures that were subsequently removed. Respondents are asked to report the number of measures that remain installed in their original location; the number moved to another location within the home; the number put into storage; the number thrown away; and the number given away, or recycled. These data are collected with the following phone survey battery:

Disp_1. Are all of the [MEASURE] you received from the program still installed in their original locations?

1. Yes

2. No
8. Don't know/Refused

[If Disp_1 not equal to 1, ask]

Disp_2. Now, I would like to understand what happened to the [QTY] [MEASURE]. First, how many [MEASURE] are currently installed in their original location?

Disp_3. How many are installed at some other location in your home?

Disp_4. How many were thrown away?

Disp_5. How many are in storage?

Disp_6. How many were sold or given away

Disp_7 How many recycled through an approved [CFL] recycling program?

Application of Measure Disposition to Impact Calculations

Measures that respondents report are thrown away or recycled, given away or sold, never installed by the program, or put into storage before end of the program year are excluded from the program's first year energy impact. For measures that accrue impact on a per-unit basis (CFLs), this adjustment is straight forward; it is simply a proportional reduction in impact. For measures that accrue impact on a per-residence basis (showerheads and aerators) the adjustment is a bit more involved.

Aerator and showerhead measures accrue impact on a per-residence basis. The impact calculation is predicated on the assumption that all of the faucets and showerheads present in the residence are retrofit through the program. The phone survey queried participants for the total number of showerheads and faucets present in their residence. The reduction in impact applied to each residence that removed an aerator or showerhead is proportional to the percent of total showerheads or aerators that the removal represents.

For example, consider a residence that has 2 showerheads, and for which 2 showerheads were replaced through the program. Further, consider that the tenant reports having removed one showerhead. For this residence, the impact credited to the program is reduced by half in proportion to the percent of total showerheads removed from the residence.

Kitchen and bathroom aerator installations are recorded separately and have different per-residence ex-ante impact assignments corresponding to their different expected usage patterns. The participant telephone survey queries respondents for the total number of kitchen faucets and the total number of bathroom faucets. Separate adjustment factors are calculated for kitchen

aerators and bathroom aerators based on the disposition of measures reported in the phone survey. Measure disposition findings and analysis results are shown in Table 3-7 below.

Table 3-7. Measure Verification and Disposition

Measure	CFLs	Aerators	Showerheads
Tracked measure count for program participants in survey that had program-reported measures installed	405 CFLs (n=72)	154 aerators (n=74)	75 SH (n=62)
Tracked measure count for participant respondents that could verify measures were installed and could verify quantities and disposition	330 (n=59)	129 (n=63)	68 (n=57)
Program Tracking System Measure Disposition Sample Size	330 CFLs	129 aerators	68 showerheads
Verified as direct installed	327	120	68
Respondent claimed not installed	3	9	0
Original Location	315	116	67
Moved	2	0	0
Recycled	0	NA	NA
Thrown away	2	2	0
Stored	4	2	1
Gave away or sold	0	0	0
Total in storage or not installed	9	13	1
Total Installed Measures	317	116	67
Adjustment to Gross Impact	96% (317/330)	Accounted for through partial retrofit adjustment	

The participant telephone survey collected information regarding the reasons participants removed measures. Survey results show that for CFLs, “didn’t work properly,” “equipment failed,” and “didn’t like the color” were the primary reasons for removal, while for water-saving measures, weak water pressure and equipment failure were the primary reasons.

Partial Retrofit Adjustment

As discussed above, showerhead and aerator impact assumptions are a function of expected residence water use, which in turn is dependent on occupancy of the dwelling unit. The ex-ante impact assumption is that 100% of the residents’ shower and faucet use is affected by the retrofit. However, if only a subset of the fixtures present home retain the measures, then only an analogous subset of associated water use is affected by the retrofit. For example, consider a residence with four showers where four are retrofit but two showerheads are later removed. Under the simplifying assumption that each shower present in the home has equal probability of being used, it follows that half of the home’s annual shower usage will be affected by the retrofit.⁴ If the residence had only two shower fixtures to begin with, and both program installed showerheads were subsequently removed, 100% of the water use would be affected.

The program tracking system recorded the number of fixtures retrofit with each measure. The total number of faucet aerators and showerheads installed and removed were collected from participants during the phone survey, although the survey did not differentiate between bath and kitchen aerators. For each survey respondent, the ratio of installed measures to the total number of fixtures is calculated. The mean of this ratio represents the final partial retrofit adjustment, shown in the table below.

Table 3-8. Partial Retrofit Adjustment

Measure	Aerators	Showerheads
Ex-ante Percent of Fixtures Retrofit	100%	100%
Average Percent of Fixtures Retrofit (Self-Report)	90%	98%

Occupancy Adjustment to Default Values

As described in detail in the Ex-Ante Gross Impact review, the expected annual energy impact of low flow showerheads and aerators is proportional to residence occupancy. The evaluation adjusted ex-ante occupancy assumption was 2.35 persons per residence, as described in the default values review provided in Appendix 5.2. Occupancy data is not collected during the residence visit. The evaluation telephone survey provided data on participant occupancy through tenant survey question D3: “How many people live in your household year-round?”

⁴ Of course some showers and faucets would be used more than others but the program tracking data does not differentiate at that level of detail. The evaluation survey could have been designed to support faucet-specific volume calculations but at the cost of a significantly longer survey.

The program ex ante default assumptions were not adjusted for this data but the data was used by the EM&V team to adjust annual ex post impact estimates.

Table 3-9 below summarizes the occupancy data from the ex-ante algorithms and the self-reported survey data. The ‘Survey-based adjustment’ is the ratio of the survey confirmed occupancy to the ex ante assumed occupancy.

Table 3-9. Occupancy Adjustment for Evaluation Adjusted Default Per Unit Impacts

Measure		Kitchen Aerator	Bath Faucet Aerator	Showerheads
A	Ex-ante assumed occupancy	2.35	2.35	2.35
B	Respondents to Occupancy Questions	74	74	74
C	Survey occupancy	1.66	1.66	1.66
D	Survey-based adjustment (C/A)	71%	71%	71%

Ex-Post Impact Results Summary for Direct Install Measure

Table 3-10 below summarizes all of the ex-post impact survey-based adjustments applied to each measure. These include adjustments for CFL removal, occupancy for water saving measures, and partial fixture retrofit for the water-saving measures. The reduction in measure impact ranges from 4% for CFLs to 36% for faucet aerators. The faucet aerator impact reduction is a result primarily of partial retrofits and lower occupancy than assumed.

Table 3-10. Ex-Post Gross Impact Survey-Based Adjustments, Direct Install Measures

Survey Based Adjustment Factor	CFL	Kitchen Aerator	Bath Faucet Aerator	Showerhead
Removals/Storage	96%			
Partial Fixture Retrofit	-	90%	90%	98%
Occupancy	-	71%	71%	71%
Ex-Post Gross Survey-Based Adjustments	96%	64%	64%	70%

3.1.4 Gross Program Impact Results

Overall Ex-Post Gross Impact Summary

Table 3-11 and Table 3-12 summarize the PY2 ex-post gross impact for the All Electric Efficiency Upgrade Program. The overall gross impact realization rate (RR) is 77% for energy and 78% for demand.

Table 3-11. First Year Ex-Post Program Energy Impact by Measure, PY2

Measure	Measure impact unit	Reported Installed Units	Evaluation Adjusted kWh/unit	Survey -Based Adjust.	Total Ex Post kWh	Total Ex Ante kWh	kWh RR
13W CFL	Lamp	2,252	23.1	96%	49,940	52,021	96%
15W CFL	Lamp	3,343	38.4	96%	123,236	128,371	96%
20W CFL	Lamp	16,213	47.0	96%	731,531	762,011	96%
CFL (unspec.)	Lamp	87	47.0	96%	3,925	4,089	96%
Showerhead	Residence	3,418	297.0	70%	710,602	1,015,146	70%
Kitchen aerator	Residence	3,507	117.0	64%	262,604	410,319	64%
Bath aerator	Residence	3,704	88.0	64%	208,609	325,952	64%
Total					2,090,448	2,697,909	77%

Source: Navigant analysis of program tracking database

Ex-ante gross impacts for CFLs are based on the number of CFL bulbs installed and the delta wattage of each bulb. Impacts for the showerheads and aerator measures are applied on a per-residence basis. Per unit impacts are provided in Appendix 5.2

Table 3-12. First Year Ex-Post Program Peak Demand Impact by Measure, PY2

Measure	Measure impact unit	Reported Installed Units	Evaluation Adjusted Peak kW/unit	Survey -Based Adjust.	Total Ex Post Peak kW	Total Ex Ante Peak kW	kW RR
13W CFL	Lamp	2,252	0.0021	96%	5	5	96%
15W CFL	Lamp	3,343	0.0035	96%	11	12	96%
20W CFL	Lamp	16,213	0.0042	96%	65	68	96%
CFL (unspec.)	Lamp	87	0.0042	96%	0	0	96%
Showerhead	Residence	3,418	0.0150	70%	36	51	70%
Kitchen aerator	Residence	3,507	0.0120	64%	27	42	64%
Bath aerator	Residence	3,704	0.0120	64%	28	44	64%
Total					173	223	78%

Source: Navigant analysis of program tracking database

Ex-ante gross impacts for CFLs are based on the number of CFL bulbs installed and the delta wattage of each bulb. Impacts for the showerheads and aerator measures are applied on a per-residence basis. Per unit impacts are provided in Appendix 5.2

3.1.5 Net Program Impact Results

This section summarizes the PY2 net-to-gross ratio estimation approach and results for the All-Electric Efficiency Upgrade Program.

Free Ridership

The objective of the free ridership assessment is to estimate the impact of program incented measures that would have been installed even in the absence of the program. This cannot be measured directly due to the hypothetical nature of the counter-factual situation. Thus, free ridership is assessed as a probability score for each measure. The evaluation relies on self-reported data collected during participant telephone surveys to assign free ridership probability scores to each measure. More specifically, for each direct install measure, the following free ridership battery is posed to each measure recipient:

FR1. At the time that you first heard about this program, had you...?

1. Already been thinking about installing [MEASURE]?
2. Already begun collecting information about [MEASURE]?
3. Had not thought about installing [MEASURE] before you first heard about the program
4. Other, specify
8. Don't know /Refused

[SKIP IF FR1 = 3]

FR2. Just to be sure I understand, did you have specific plans to install [MEASURE] before learning about the program?

1. Yes
2. No
8. Don't know/Refused

FR3. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have installed [MEASURE] if you had not received (it/them) through the program? [0-10, DK, REF]

I'm going to read two statements about the [MEASURE] you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

FR4. There may have been several reasons for the installation of the [MEASURE], but the program was a critical factor in my decision to have the [MEASURE] installed.

FR5. I would have installed [MEASURE] within a year of when I did even if I had not received (it/them) from the program.

Free Ridership Scoring

The free ridership data was assembled into a probability score in a step-by-step fashion, applying the following algorithm:

If the customer had not considered the measure prior to participating in the All-Electric program then the probability of free ridership is estimated to be zero. That is:

1. [If FR1=3 then free ridership score=0]

Similarly, if the customer did not have specific plans to install the program measure prior to participation, and the self-reported probability of installing the measure was less than or equal to 3, then the probability of free ridership is estimated to be zero.

2. [If FR2=2 and FR3 is less than or equal to 3, then free ridership=0]

If neither of the above criteria holds, then responses to questions FR3, FR4 and FR5 are used to calculate the probability of free ridership. The program is a direct install program, where the customer demonstrated very little initiative to install the measures, as the actual purchase and install activities were performed by program staff. For this reason, participant self-reported

intentions to install these measures [FR3 and FR5] even without the program are discounted relative to the self-reported importance of the program to the installation [FR4], at a rate of 2 to 1. The corresponding formula for calculating free ridership is shown below:

$$3. [(FR3+FR5)/2 *(1/3) + (10-FR4)*(2/3)]$$

Note that in the above formula, if FR3 or FR5 are invalid (missing or “don’t know”) then the first component [(FR3+FR5)/2] relies on the non-missing factor. That is, if FR3 is invalid the formula is: [FR5*(1/3)+(10-FR4)*2/3]. If FR3 and FR5 are missing then the score is based on FR4 alone [FR4].

A bulb count weight is applied to the overall result for CFL free ridership, while other measure free ridership scores are aggregated using an equal weight, in accordance with the assignment of ex-ante impact. Application of this algorithm results in the following measure and program free ridership estimates in the table below:

Table 3-13. Free Ridership Results by Measure

Measure	Free Ridership
CFL	27%
Low Flow Showerheads	9%
Faucet Aerators	6%

Spillover

The objective of the spillover assessment is to estimate the impact arising from efficient measures installed as a result of the program that were not incented by the program. The evaluation relies on self-reported data collected during the telephone survey to identify these measures and assess the role of the program in the decision to install. For each participant receiving a given direct install measure category, the following spillover battery is posed:

SP1. Have you installed any more [MEASURE] since you received the ones through the program?

1. Yes
2. No
8. Don’t know/Refused

SP2. How many additional [MEASURE] have you installed?



SP3. How influential was the program in encouraging you to install the additional [MEASURE]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

Spillover Scoring

The survey data was assembled into an assessment of spillover impact through application of the following method:

If the customer installed additional units of the direct install measure following their participation, and the program was highly influential in the decision to install those measures, the adoption is considered to be potentially program spillover.

1. [If SP1=1 and SP3 is greater than or equal to 8, then adoption is spillover]

Considerations and Measure-Specific Adjustments to Spillover

Compact Fluorescent Bulbs

The impact credit granted for CFL spillover adoptions must avoid double counting impact credit accrued already through the upstream residential lighting program, which was in operation throughout PY2. Our first thought regarding the best way to be fair in assigning credit for CFL spillover adoptions was to reduce credit by the overall probability that any CFL bulb purchased in ComEd service territory would be an upstream program bulb. However, there are a couple of complicating factors to this approach. The first is that the market share of program bulbs is not a readily available number. Second, the residential lighting program experienced a substantial amount of free ridership (46%), and there is no reason that one program's free ridership cannot be another program's net impact. Thus, it is not necessary that bulbs be un-incented for them to legitimately qualify for credit under the All-Electric program.

There is some available evidence regarding the CFL market share of Residential Lighting Program bulbs. The Residential Lighting general population survey revealed that 87% of CFLs are purchased at stores participating in the ComEd lighting program. Among program stores, the shelf space dedicated to ComEd program CFL bulbs is 53% of the overall shelf space dedicated to CFLs (for standard bulbs), and 62% for specialty bulbs. If we assume shelf space relates directly to sales share, then 46% of standard CFLs and 54% of specialty bulbs are Residential Lighting program bulbs.

Due to the uncertainty in this area, we take a conservative approach and assume that only 50% of the impact arising from All Electric CFL spillover adoptions are creditable to the program. Again, even if these customers purchased a discounted bulb, the purchase decision was either

influenced by both programs (making the 50% assumption reasonable) or influenced by only the All Electric program (making the 50% assumption conservative).

Low Flow Showerheads and Faucet Aerators

Crediting a spillover adoption toward program net impact is problematic if the spillover measure is a showerhead or an aerator. The problem arises from the approach to ex-ante impact. In particular, the ex-ante gross impact calculations for these measures assume the residence is fully retrofit with these water saving measures. That is, the full complement of expected faucet and shower hot water use is affected by the retrofit. If some of the original faucets or showerheads remain unchanged by the program retrofit, an adjustment is applied to the ex-ante impact to yield ex-post gross impact. Spillover adoptions of showerheads and aerators are important to impact only to the extent that they offset an incomplete retrofit case. Spillover adoptions are incorporated into the impact calculation for showerheads and aerators as a component of the partial retrofit adjustment. The partial retrofit adjustment is calculated with and without the spillover credit and the difference is the spillover estimate.

Spillover estimates, using this approach and expressed as a percent of measure ex-ante impact are shown in Table 3-14 below:

Table 3-14. Spillover Results by Measure

Measure	Percent of Participants Reporting Spillover Adoption	Mean Spillover Quantity per Adoption	Spillover Adjustment	Free-Ridership Adjustment	NTG Ratio
CFL	18%	4.75 bulbs	8%*	27%	81%
Showerheads	2%	1 showerhead	2%^	9%	93%
Aerators	0%	-	0%	6%	94%

*Calculated as $(0.18 * 4.75 * 3870 / 21895) * 0.5$, where 3,870 is the number of participants receiving CFLs, 21,895 is total number of program bulbs, and 0.5 is the reduction to avoid double counting with the upstream lighting program.

^Calculated as the difference in the partial retrofit adjustment with spillover credit versus without spillover credit.

Table 3-15 and Table 3-16 below integrate both net-to-gross analysis results and ex-post gross impact results to form final program impact estimates for PY2. The gross impact realization rates reflect the combined effect of measure removals, reported non-installation, partial retrofits, and occupancy. The net-to-gross ratios (NTG) reflect the combined effect of both participant free ridership and participant spillover. The combined effect of the gross impact realization rates and the net-to-gross ratios on the direct install ex ante measure impact is a reduction of 32% in energy and demand savings.

Table 3-15. First Year Ex-Post Program Net Energy Impact by Measure, PY2

Measure	Total Ex Ante kWh	kWh RR	Total Ex Post Gross kWh	NTG Ratio	Total Ex Post Net kWh
13W CFL	52,021	96%	49,940	81%	40,452
15W CFL	128,371	96%	123,236	81%	99,821
20W CFL	762,011	96%	731,531	81%	592,540
CFL (unspec.)	4,089	96%	3,925	81%	3,180
Showerhead	1,015,146	70%	710,602	93%	660,860
Kitchen aerator	410,319	64%	262,604	94%	246,848
Bath aerator	325,952	64%	208,609	94%	196,093
Total	2,697,909	77%	2,090,448	88%	1,839,793

Source: Navigant analysis of program tracking database

Ex-ante gross impacts for CFLs are based on the number of CFL bulbs installed and the delta wattage of each bulb Impacts for the showerheads and aerator measures are applied on a per-residence basis. Per unit impacts are provided in Appendix 5.2

Table 3-16. First Year Ex-Post Program Net Peak Demand Impact by Measure, PY2

Measure	Total Ex Ante kW	kW RR	Total Ex Post Gross kW	NTG Ratio	Total Ex Post Net kW
13W CFL	5	96%	5	81%	4
15W CFL	12	96%	11	81%	9
20W CFL	68	96%	65	81%	53
CFL (unspec.)	0	96%	0	81%	0
Showerhead	51	70%	36	93%	33
Kitchen aerator	42	64%	27	94%	25
Bath aerator	44	64%	28	94%	26
Total	223	78%	173	87%	151

Source: Navigant analysis of program tracking database

Ex-ante gross impacts for CFLs are based on the number of CFL bulbs installed and the delta wattage of each bulb Impacts for the showerheads and aerator measures are applied on a per-residence basis. Per unit impacts are provided in Appendix 5.2

3.2 Process Evaluation Results

The process evaluation of the All-Electric Efficiency Upgrade program focused on the following areas: program administration, profile of participating residences, the common area assessment,

marketing and outreach, building owner/manager and resident satisfaction with program, benefits and drawbacks, and challenges.

3.2.1 Program Administration

Administration of the All-Electric Efficiency Upgrade program has not changed significantly from PY1. Changes from PY1 to PY2 include:

- The program changed its eligibility requirements to include buildings with gas space heating as long as there is an electric water heater. However, the number of buildings in the ComEd service territory that fit this description is low and consequently there are only a few participating properties in PY2 that are not all-electric.
- Compared to PY1, the program worked more closely with municipalities and housing authorities to gather information on qualified buildings.
- In PY1, the resident had to be home for the energy specialist to enter the home and make the upgrades. This changed in PY2 so that building maintenance staff can let the program staff into the homes when the resident is not present. Partly for this reason, in PY2 second visits to buildings were less common than in PY1.

In the PY1 report, the evaluation team made a number of process-related recommendations. Nearly all those recommendations were addressed by the program. One recommendation that still needs attention is better coordination between the All Electric program and ComEd's commercial and industrial programs to increase participation of owners of multifamily buildings. This could include better tracking of participants receiving the C&I incentives or follow up from the C&I program staff.

In addition to tenant-occupied apartment buildings, the program also targets owner-occupied buildings (i.e., condominiums). To ensure that the visit is efficient in time and cost, the program does not typically target buildings with less than eight units. The program manager stated that exceptions to this guideline are sometimes made if there are multiple buildings in the same area.

The program continued to maintain an extensive database of participants and measures installed and the final tracking databases were very thorough. Honeywell has done a much better job in PY2 collecting tenant information such as phone numbers. The share of participants with phone numbers recorded in the database increased from 0.4% in PY1 to 99.9% in PY2. It was necessary to merge the program measure database with the program contact information database. This merge was only possible for units with a premise ID, which were not filled in 476 cases (about 11%). Better recording of premise IDs in PY3 would improve the quality of the database which would then support a more complete evaluation sample.

3.2.2 Participating Residences

According to survey results, building residents who participated in the survey were far more likely to rent or lease their home (69%) than own it (31%). The program tracking data indicates that 87% of participants rent or lease their home and 13% own their home. All survey respondents said that they paid their own electric bill. Interviews with nine of ten building owners supported this claim though one owner said he paid his tenants' electric bills. Survey respondents were less likely (16%) to pay the water bill.

3.2.3 Common Area Assessment

Eight of the ten building owners and managers interviewed remember receiving an assessment of their building's common areas with energy saving recommendations. Of the eight who recalled the assessment, four remembered specific common area lighting measures that were recommended by the program. Two owners/managers mistakenly answered the question in terms of the measures installed in the individual units and not the common area. The remaining two could not recall specific recommendations from the assessment. Notably, of the four respondents that recalled receiving specific common area lighting measure recommendations, three reported that they have implemented the recommendations since the visit.

Only one building owner reported that he had received a rebate for the installation of lighting measures identified in the common area assessment. However, the evaluation team could not verify the receipt of this rebate as the program manager does not know of any participating buildings that received incentives from the commercial and industrial programs. Currently the multifamily program database does not track rebates from or participation in the C&I program. It may be possible to match address and other site information to identify participants common to both programs, and this will be attempted by the evaluation team in PY3.

3.2.4 Program Marketing and Outreach

Five of the ten surveyed building managers/owners first heard about the program through direct contact with ComEd or Honeywell program staff. The others learned about the program through other means such as bill inserts, brochures/flyers and word of mouth. It is unclear if these materials promoted the All-Electric Efficiency Upgrade or other ComEd commercial programs.

When asked to identify the best way to promote the program to residents, half of the building owners and managers recommended using flyers, print ads and mailings, while others suggested phone calls or bill inserts. Due to the focused reach of the program, the program believes that bill inserts are not effective as an outreach tool.

Other than targeting additional qualifying buildings with the same ownership and/or management as a participating building, the All-Electric program has only a limited ability to leverage the marketing and promotional activities from building to building. If building owners and supervisors are relatively isolated and do not communicate with others, the program cannot rely on referrals or word-of-mouth as a means of promotion because there are few opportunities. However, building owner and manager associations may be an avenue for word-of-mouth promotion.

According to Honeywell, tenant participation varies greatly depending on the engagement of the building manager. The most engaged building managers will help to post flyers around the building, offer adequate notice of the site visit and provide maintenance personnel to accompany Honeywell during the site visit to add validity of the program to tenants. The lesser engaged managers will only provide access to the buildings for the agreed amount of time and will provide no support, resulting in Honeywell having to recruit tenant participation directly onsite by knocking on the doors of individual units. As expected, Honeywell claims that the participation rate of tenants in buildings with more cooperative building managers is much higher.

Only one-third (33%) of residents recall seeing or receiving any marketing materials or other information about the program. Of those that do recall receiving any information about the program, most (52%) received a flyer in their mailbox. Residents' recollection of the materials may be poor, however, as 20% recall receiving bill inserts, which are not part of the program's marketing plan.

Similar to building managers, residents also believe that flyers/ads/mailings (31%) and bill inserts (31%) are the best ways to reach out to other residents. Residents also recommended direct outreach by program representatives (19%) and contacting the landlord/building manager (12%) as other methods of informing residents about the program.

Some buildings with 24-hour security centers do not allow unannounced tenant visits. Instead, the building tries to set up appointments for the individual visits. The program has found this method to be very ineffective and avoids it if possible.

3.2.5 Program Satisfaction

The evaluation team asked both groups to rate their satisfaction with ComEd overall, the program overall, the overall site visit, and various aspects of the program on a scale that ranges from 0 to 10, with 0 meaning very dissatisfied and 10 meaning very satisfied. Satisfaction with the All-Electric Efficiency Upgrade program is high among both residents and building owners and managers. The average overall program rating among residents was 8.5 with 64% giving the program a rating of 9 or 10. Noting the sample size, eight of ten building owners and managers gave the program a rating of 9 or 10.

Table 3-17. Satisfaction with Elements of the All-Electric Efficiency Upgrade Program

Satisfaction with...	Mean Rating (0=Very Dissatisfied, 10=Very Satisfied)	
	Residents (n=75)	Building Owners/Managers (n=10)
ComEd overall	8.3 (n=74)	8.5
All-Electric Energy Efficiency Upgrade program overall	8.5	9.3
Overall site visit	8.6	9.6
Honeywell Service Representative	8.9 (n=68)	9.7
Installed energy efficient measures	8.8	9.2
Leave behind report/Facility Report	8.4 (n=67)	9.0
Time to schedule facility assessment	n/a	8.9

Residents expressed satisfaction with all aspects of the visit with highest average ratings given to the Honeywell Service Representative (8.9) and the installed energy measures (8.8). The Honeywell Service Representative also received high ratings from building owners and managers. Both groups gave slightly lower, but still very satisfied, ratings to ComEd overall.

Building owners and managers were also asked to provide their perceived rating of residents' satisfaction with the program. Overall, they believe the residents were very satisfied with the program and provide an average rating of 8.6, which is very similar to the residents' actual rating of 8.5. The building owners/managers who gave the lowest perceived ratings for their residents (5 and 7) were those that did not remember receiving a common area assessment.

Two of the ten building owners/managers reported that a resident had complained about the program or the equipment installed through the program. One of these responded to the problem by reinstalling the old equipment. However, ninety-five percent of residents state that they have not experienced any problems with the program. Of the four residents that have experienced problems, two experienced problems with program staff, one experienced a problem with the installed equipment and one experienced problems with both staff and

equipment. Only one of these residents complained about the problem and this was to their building manager/owner.

3.2.6 Benefits and Drawbacks

Building owners and managers identify saving money, electricity, and water as the primary benefits of participating in the program. Only one could identify a drawback to participating, which was that the program “was time consuming.”

When asked to identify ways the program could be improved, one building owner said the program could be “more proactive and should contact the buildings,” (which the program already does) while another requested “more help with paperwork.”

Residents were asked whether they had noticed any savings on their electric bills since participating in the program. More than half (52%) said they had noticed savings while 32% had not and 16% did not know. This positive perception of the program may result in future energy efficient behavior changes.

3.2.7 Challenges

According to the ComEd program manager, targeting and installing measures inside owner-occupied multifamily buildings (e.g., condominiums) is a challenge for the program. The decentralized ownership of condominiums is a challenge as the decision to participate has to be made by the individual owner instead of a building owner or manager. Additionally, condominiums often have a lower number of units than apartment buildings. To offset these challenges, the program requires a minimum of eight units in the building and posts a sign-up sheet at the building where individual owners can sign up for specific times to ensure that owners are home at the time of the visit and that Honeywell visits at a time when the most residents are home. Furthermore, the program manager stated that showerheads are a particular challenge as condominiums often have higher quality bathroom fixtures than apartment buildings. As a result, condominium residents are less likely to want the low-flow showerhead offered by the program because of aesthetic reasons like not matching other fixtures.

Another challenge reported by the program manager is convincing both residents and building owners/managers of the savings and quality of the program’s measures. To counter this, the program staff and service representative attempt to educate them about the measures during the visit.

3.2.8 Program Theory

Given modest changes in the program design this topic was not revisited. Please refer to the Program Year 1 report.

3.3 Cost Effectiveness Review

This section addresses the cost effectiveness of the All-Electric Efficiency Upgrade program. Cost effectiveness is assessed through the use of the Total Resource Cost (TRC) test. The 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.”⁵

ComEd uses DSM^{More}TM software for the calculation of the TRC test.⁶ The DSM^{More} model accepts information on program parameters, such as number of participants, gross savings, free ridership and program costs, and calculates a TRC which fits the requirements of the Illinois legislation. Environmental benefits have been quantified for CO₂ reductions, using a value of \$0.013875 per kWh.

One important feature of the DSM^{More} 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 on electric prices that comes from extreme weather conditions. Extreme weather creates extreme peaks which create extreme prices. These extreme prices generally occur as price spikes and they create 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. DSM^{More} is able to quantify the weighted benefits of avoiding energy use across years which have this skewed price distribution.

⁵ Illinois Power Agency Act SB1592, pages 7-8.

⁶ Demand Side Management Option Risk Evaluator (DS^{More}) software is developed by Integral Analytics.

Table 3-18 summarizes the unique inputs used in the DSMore model to assess the TRC ratio for the All-Electric Efficiency Upgrade program in PY2. 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 3-18. Inputs to DSMore Model for All-Electric Efficiency Upgrade Program

Item	Value Used
Measure Life	9 years
Participants	4,219
Annual Gross Energy Savings	2,976 MWh
Gross Coincident Peak Savings	0.2 MW
Net-to-Gross Ratio	80%
Utility Administration and Implementation Costs	\$76,500
Utility Incentive Costs	\$456,884
Participant Contribution to Incremental Measure Costs	\$0

Based on these inputs, the Illinois societal TRC for this program is 2.50 and the program passes the TRC test. The standard TRC calculation produced by DSMore is 1.82.

Section 4. Conclusions and Recommendations

4.1 Conclusions

This section highlights the findings and recommendations from the evaluation of the All-Electric Efficiency Upgrade program implemented by Honeywell on behalf of ComEd. The primary objectives of this evaluation were to quantify the gross and net energy impacts resulting from the direct installation of low cost measures in multifamily residences and to assess program theory, marketing, and delivery. Below are the key conclusions and recommendations.

4.1.1 Program Impacts

This report addresses the following evaluation adjustments to ex-ante impact values:

- Adjustments for consistency with ex ante default per unit impact assumptions
- Adjustments for measure disposition (removals and failures)
- Adjustments for partial retrofits (water saving measures)
- Adjustments for residence occupancy

As part of the impact assessment for the All Electric Efficiency Upgrade Program, the Evaluation Team performed a mid-stream assessment of the program default measure impact calculations and algorithms. This review was completed in the middle of the program cycle, in January of 2010, and reported to program staff. The purpose of the default impact claim review conducted in January was to assess the underlying algorithms, assumptions, and calculated default savings proposed by ComEd for the All-Electric Efficiency Upgrade Program in PY2. The review utilized a number of secondary data sources, including census data and publicly available research and evaluation reports. Details of this review are presented in Appendix 5.2.

Evaluation adjustments to default CFL baseline lamp and daily hours of operation assumptions were considered but not implemented based on responses to the PY2 participant survey.

Participant survey-based adjustments were applied to each measure. These include adjustments for CFL removal, occupancy for water saving measures, and partial fixture retrofit for the water-saving measures. The reduction in measure impact ranges from 3% for CFLs to 30% for showerheads to 36% for faucet aerators. The faucet aerator and showerhead impact reduction is a result primarily of partial retrofits and lower occupancy than assumed.

The net-to-gross ratios (NTG) for measures reflect the combined effect of both participant free ridership and participant spillover. Free-ridership was highest for CFLs at 27%, less for

showerheads and aerators at 9% and 6% respectively. Spillover was highest for CFLs at 8%, minimal for showerheads at 2%, and non-existent for aerators.

Some building owners are following-up on the common area assessment to install specific recommended measures. If the building owner pursues those measures through the Business Prescriptive program, those savings will be reported and evaluated in that program. Three building owners indicated they installed common area measures as a result of the common area assessment, but did not indicate applying for a Business Prescriptive rebate. The energy savings for these non-rebated common area measures are potentially significant additions to All Electric program impacts. The PY3 evaluation will attempt to quantify non-rebated program-induced common area impacts.

The combined effect of the gross impact realization rates and the net-to-gross ratios on the direct install ex ante measure impact is a reduction of 32% in energy and demand savings.

4.1.2 Program Processes

Overall, the All-Electric Efficiency Program has been implemented effectively and consistent with its design. Both participating residents and building owners/managers report very high satisfaction with all elements of the program.

4.2 Recommendations

4.2.1 Impact Recommendations

The evaluation team has the following recommendations that could help improve program performance in the future:

1. Update default savings assumptions and methodologies to reflect evaluation adjusted values from PY2.
2. We recommend that the implementer collect occupancy information in PY3, and that ComEd use that information to reduce the occupancy adjustment.
3. Develop and implement procedures for spot checking water flow rates

If a common type of baseline showerhead or aerator is installed within a building, it would be valuable feedback to spot check flow rates pre- and post-retrofit to confirm energy savings. There are simple, inexpensive kits for quickly checking gallons per minute. If baseline water flow rates are lower than assumed, the Program may need to specify products with lower flow rates.

4. Improve procedures for quality control and quality assurance of program tracking data

We recommend the program tracking data receive periodic data quality reviews and clean up, and that data entry include checks for values outside of limits. Data exported for the evaluation team should also be checked for anomalies.

5. The energy savings for non-rebated common area measures are potentially significant additions to All Electric program impacts. The PY3 evaluation will attempt to quantify non-rebated program-induced common area impacts.

4.2.2 Process Recommendations

The evaluation team recommends the following process improvements:

- In PY2, the program targeted very few buildings that qualified with gas space heat and electric water heating. Given the low number of the all-electric buildings in the service territory, targeting gas/electric buildings will likely be necessary to meet PY3 savings goals. According to the program manager, this is already underway as part of the PY3 implementation.
- The program may also want to review its eligibility criteria for buildings as there may be an untapped market of multifamily homes with less than eight units. This would increase the market opportunity for ComEd.
- Responses from building owners and managers indicate some confusion with the difference between common area assessments and the direct installation portion of the program. The program staff should work to ensure that the building owner or manager understands the differences between the common area assessment and the direct installation, including the corresponding recommendations. This could take place during the initial meetings and subsequent visits. This may also increase the number of properties channeled into the C&I programs.
- The multifamily program should consider formally tracking the buildings that participate in the ComEd Smart Ideas for your Business program as a result of the common area audit.
- Because the customer contact information and installed measure data are contained in two databases, the unit's premise ID must be recorded to link the customer to the measures. Better recording of this field in PY3 would improve the data quality.

Section 5. Appendices

5.1 Data Collection Instruments

**COMED MULTIFAMILY ALL-ELECTRIC EFFICIENCY UPGRADE PROGRAM
PARTICIPATING TENANT SURVEY
August 19, 2010 DRAFT**

INTRODUCTION AND SCREENER

Hello, this is [INTERVIEWER'S NAME] from Opinion Dynamics calling on behalf of ComEd.. This is not a sales call. We are contacting customers who have participated in ComEd's All-Electric Efficiency Upgrade Program. May I please speak with [CUSTOMER_NAME]? [If needed: This program provided free installation of compact fluorescent light bulbs, faucet aerators and showerheads.]

Are you the person who was most familiar with the upgrades? (If not may I please speak with the person who was most familiar with the upgrades?)

CONTINUE WITH RIGHT PERSON: We are conducting a study to evaluate ComEd's All-Electric Efficiency Upgrade 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.

Throughout this survey I will refer to your apartment or condo as your "home."

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

SCREENING QUESTIONS

To start, we have several questions regarding the upgrades that were installed in your home. The answers to these questions are very important so that ComEd can determine how much energy is being saved.

S1. Our records show that during the visit to your home, a ComEd representative gave you the following upgrades. Please confirm that this is correct. Did you receive.... [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

- a. [If CFL=1] Compact Fluorescent Light Bulbs
- b. [If AERATOR=1] Faucet Aerators
- c. [IF SHOWERHEAD =1] A low flow showerhead



[CONTINUE IF ANY S1a-d = 1, ELSE THANK AND TERMINATE]

Now I would like to ask you about the upgrades you received through the program.

[ROTATE ORDER OF SECTIONS C, FA, AND SH]

CFL VERIFICATION [ASK IF CFL=1, ELSE SKIP TO AMV1]

[ASK SECTION IF S1a =1]

CFLMV1. Our records show that [insert CFL_QTY] CFL(s) were installed by the ComEd representative during the All Electric Efficiency Upgrade Program's visit to your home. Is this correct?

1. Yes, quantity is correct
2. No, quantity is incorrect
8. (Don't know) [SKIP TO NEXT SECTION]
9. (Refused) [SKIP TO NEXT SECTION]

[ASK IF CFLMV1=2]

CFLMV2. How many CFLs were installed during the visit? [Numeric open end (up to 99), DK, REF] [USE AS CFL_QTY FOR REMAINDER OF SURVEY UNLESS DK OR REF, **IF DK OR REF THEN SKIP TO NEXT SECTION**]

CFLMV3. Our records indicate that the CFLs were installed in locations that operate 2 or more hours per day. Is this correct?

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

CFLMV3a. [ASK IF CFLMV3=2] Where were the CFLs installed?
[OPEN END, DK, REF]

CFLMV4. What type of light bulbs did the CFLs replace? (Select all that apply)

01. Halogen
02. Incandescent
03. CFL



- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[ASK IF CFLMV4_n=3]

CFLMV5. How many CFLs were removed and replaced with other CFLs through the program? [NUMERIC OPEN END up to MEAS_QTYn, DK, REF]

CFLMV6. [Wording if CFL_QTY=1] Is the CFL you received from the program still installed in the original location?

[Wording if CFL_QTY>1] Are all of CFLs you received from the program still installed in their original locations?

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

[ASK IF CFLMV6 =2 AND CFL_QTY=1]

CFLMV7. Which of the following best describes what happened to the CFL? (READ LIST AND RECORD ONE RESPONSE)

- 01. It is installed at some other location in your home
- 02. It was thrown away
- 03. It is in storage
- 04. It was sold or given away
- 05. It was recycled through an approved CFL recycling program
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[ASK IF CFLMV6 =2 AND CFL_QTY>1]

CFLMV8. Now, I would like to understand what happened to the [insert CFL_QTY] CFLs. First, how many CFLs are currently installed in their original location? [NUMERIC OPEN END up to CFL_QTY, DK, REF]

[CHECK IF CFLMV8=VERIFIED QUANTITY, THEN SKIP TO CFLMV19]

[ASK IF CFLMV6 =2 AND CFL_QTY>1]

CFLMV9. How many are installed at some other location in your house? [NUMERIC OPEN END up to CFL_QTY, DK, REF]



[IF CFLMV9+8 = VERIFIED QUANTITY, THEN SKIP TO CFLMV16]

[ASK IF CFLMV6 =2 AND CFL_QTY>1]

CFLMV10. How many were recycled through a CFL recycling program? [NUMERIC OPEN END up to CFL_QTY, DK, REF]

[IF CFLMV10+9+8 = VERIFIED QUANTITY, THEN SKIP TO CFLMV16]

[ASK IF CFLMV6 =2 AND CFL_QTY>1]

CFLMV11. How many program bulbs have been thrown away? [NUMERIC OPEN END up to CFL_QTY, DK, REF]

[IF CFLMV11+10+9+8 = VERIFIED QUANTITY, THEN SKIP TO CFLMV16]

[ASK IF CFLMV6 =2 AND CFL_QTY>1]

CFLMV12. How many are in storage? [NUMERIC OPEN END up to CFL_QTY, DK, REF]

[IF CFLMV12+11+10+9+8 = VERIFIED QUANTITY, THEN SKIP TO CFLMV16]

[ASK IF CFLMV6 =2 AND CFL_QTY>1]

CFLMV13. How many were sold or given away? [NUMERIC OPEN END up to CFL_QTY, DK, REF]

[IF CFLMV8 OR CFLMV9 OR CFLMV10 OR CFLMV11 OR CFLMV12 OR CFLMV13 = 98 or 99 THEN SKIP TO CFLMV15]

[CFL_QTY check

IF CFLMV8+ CFLMV9+ CFLMV10+CFLMV11+ CFLMV12+ CFLMV13= CFL_QTY

then proceed to CFLMV15.

ELSE IF CFLMV8+ CFLMV9+ CFLMV10+CFLMV11+ CFLMV12+ CFLMV13> CFL_QTY

then read "I must have made a mistake, those quantities add up to more than were installed through the program. Let me read through the last few questions again" and skip back to CFLMV8

ELSE IF CFLMV8+ CFLMV9+ CFLMV10+CFLMV11+ CFLMV12+ CFLMV13< CFL_QTY

then proceed to CFLMV14]

CMV19. What were done with the remaining [MEAS_QTY_n -(CFLMV8+ CFLMV9+ CFLMV10+CFLMV11+ CFLMV12+ CFLMV13)] CFLs?

[OPEN END, DK, REF]



[ASK IF CFLMV13>0 (BUT NOT DK/REF) OR CFLMV7=4]

CFLMV15. [Wording if CFL_QTY=1 OR CFLMV13=1] Is the CFL you sold or gave away located in ComEd's service territory?

[Wording if CFLMV13>1] Are all of the CFLs sold or given away located in ComEd's service territory?

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

[ASK IF CFLMV6=2]

CFLMV16. Why [were the CFLs/was the CFL] moved from [their/its] original location?

(MULTIPLE RESPONSE UP TO 7 RESPONSES)

01. (Equipment failed)
02. (Didn't work properly)
03. (Wrong size – too small or too large)
04. (Didn't like the color)
05. (Didn't like the appearance/unattractive)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF CFLMV6=2]

CFLMV17. What did you replace the CFL(s) with? (MULTIPLE RESPONSE)

01. (With a new CFL)
02. (With an incandescent bulb)
03. (Did not replace)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF CFLMV7=3 OR CFLMV12>0 (BUT NOT DK/REF)]

CFLMV18. When do you think you will install the CFL(s) you put in storage? Would you say ... (READ ANSWER LIST)

1. Within the next 3 months
2. 3 to 6 months from now



3. 6 to 12 months from now
4. More than a year from now
5. Never
8. (Don't know)
9. (Refused)

CFLMV19. Have you installed any more CFLs since you received the ones through the program?

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

[ASK IF CFLMV19=1, ELSE SKIP TO CFLMV22]

CFLMV20. How many additional CFLs have you installed? [NUMERIC OPEN END up to 999, DK, REF]

CFLMV21. How influential was the program in encouraging you to install the additional CFL(s)? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential. [0-10, DK, REF]

CFLMV22. Since receiving CFLs from the program, have you recommended CFLs to anyone else?

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

CFLMV23. At the time that you first heard about this program, had you...? (READ LIST UNTIL RESPONDENT SAYS NO)

01. Already been thinking about purchasing CFLs?
02. Already begun collecting information about CFLs?
03. (Had not thought about purchasing CFLs before you first heard about the program)
00. (Other, specify)
98. (Don't know)
99. (Refused)



[SKIP IF CFLMV23=03,0,98,99]

CFLMV24. Just to be sure I understand, did you have specific plans to install CFLs before learning about the program?

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

CFLMV25. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have purchased and installed CFLs if you had not received (it/them) through the program? [0-10, DK, REF]

[IF (CFLMV24=2 OR CFLMV23=3) AND (CFLMV25<=3) THEN SKIP TO NEXT SECTION]

I'm going to read two statements about the CFLs you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

CFLMV26. There may have been several reasons for my installation of CFLs, but the program was a critical factor in my decision to have the CFLs installed. [0-10, DK, REF]

CFLMV27. I would have bought CFLs within a year of when I did even if I had not received (it/them) from the program. [0-10, DK, REF]

Consistency Check & Resolution

Consistency Check & Resolution

[CFLCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) The question responses that will be used to trigger CFLCC1 are:

- CFLMV25 (how likely is it that you would have bought the same item)
- CFLMV26 (program was a critical factor in my decision to install item)
- CFLMV27 (would have bought item within a year, without the program)

{IF CFLMV25 = 0,1,2 AND CFLMV26 = 0,1, 2 AND CFLMV27 = 8, 9,10, ASK CFLCC1.
INCONSISTENCY1='you would likely not have purchased the CFLs without the program'}



{IF CFLMV25 = 8, 9,10 AND CFLMV26 = 8, 9,10 AND CFLMV27 = 0,1, 2, ASK CFLCC1.
INCONSISTENCY1= 'you would likely have purchased the CFLs without the program'}

{IF CFLMV26 = 0,1, 2 AND CFLMV25 = 0,1, 2 AND CFLMV27 = 0,1, 2, ASK CFLCC1.
INCONSISTENCY1='the program was not a critical factor in your decision to install the CFLs'}

{IF CFLMV26 = 8, 9,10 AND CFLMV25 = 8, 9,10 AND CFLMV27 = 8, 9,10, ASK CFLCC1.
INCONSISTENCY1='the program was a critical factor in your decision to install the CFLs'}

{IF CFLMV27 = 8, 9,10 AND CFLMV25 = 0,1, 2 AND CFLMV26 = 0, 1,2, ASK CFLCC1.
INCONSISTENCY1= 'you would have bought the CFLs within a year even without the program'}

{IF CFLMV27 = 0,1, 2 AND CFLMV25 = 8, 9,10 AND CFLMV26 = 8,9,10, ASK CFLCC1.
INCONSISTENCY1='you would not have bought the CFLs within a year without the program'}}

CFLCC1. Let me make sure I understand you. Earlier, you said [insert inconsistency1], but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision install the CFLs at the time you did? [OPEN END, DK, REF]

FA. FAUCET AERATOR MEASURE VERIFICATION

[ASK SECTION IF S1b=1]

AERMV1. Our records show that [insert AER_QTY] faucet aerator(s) were installed by the ComEd representative during the All Electric Efficiency Upgrade Program's visit to your home. Is this correct?

1. Yes, quantity is correct
2. No, quantity is incorrect
8. (Don't know)
9. (Refused)

[ASK IF AERMV1=2]



AERMV2. How many faucet aerators were installed? [Prompt for best guess.] [NUMERIC OPEN END up to 999, DK, REF] **[IF DK OR REF, SKIP TO NEXT SECTION]**[USE AS AER_QTY FOR REMAINDER OF SURVEY]

AERMV3. [Wording if AER_QTY=1] Is the faucet aerator still installed in the original location?
[Wording if AER_QTY>1] Are all of faucet aerators still installed in their original locations?

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

[ASK IF AERMV3 =2 AND AER_QTY=1]

AERMV3a. Which of the following best describes what happened with the faucet aerator?
(READ LIST AND RECORD ONE RESPONSE)

01. It is installed at some other location in your home
02. It was thrown away
03. It is in storage
04. It was sold or given away
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF AERMV3 =2 AND AER_QTY>1]

Now, I would like to understand what happened to the [insert AER_QTY] aerators. How many... [SHOW ON SAME SCREEN]

AERMV3b. Are currently installed in their original location?

[CHECK IF AERMV3b =VERIFIED QUANTITY, THEN SKIP TO AERMV8]

AERMV3c. Are installed at some other location in your house?

[IF AERMV3b+c = VERIFIED QUANTITY, THEN SKIP TO AERMV5]

AERMV3d. Have been thrown away?

[IF AERMV3b+c+d= VERIFIED QUANTITY, THEN SKIP TO AERMV5]



AERMV3e. Are in storage?

[IF AERMV3b+c+d+e = VERIFIED QUANTITY, THEN SKIP TO AERMV5]

AERMV3f. Were sold or given away?

[NUMERIC OPEN END up to AER_QTY, DK, REF]

[IF AERMV3b or AERMV3c or AERMV3d or AERMV3e or AERMV3f=98 OR 99 THEN SKIP TO AERMV4]

[MEAS_QTY check

If $AERMV3b + AERMV3c + AERMV3d + AERMV3e + AERMV3f = AER_QTY$

then proceed to AERMV4.

Else if $AERMV3b + AERMV3c + AERMV3d + AERMV3e + AERMV3f > AER_QTY$

then read "I must have made a mistake, those quantities add up to more than were installed through the program. Let me read through the last few questions again" and skip back to AERMV3b

Else if $AERMV3b + AERMV3c + AERMV3d + AERMV3e + AERMV3f < AER_QTY$

then proceed to AERMV3g]

AERMV3g. What were done with the remaining [AER_QTY –

(AERMV3b+AERMV3c+AERMV3d+AERMV3e+AERMV3f)] aerators? [OPEN END, DK, REF]

[ASK IF AERMV3f>0 (BUT NOT DK/REF) OR AERMV3a=4]

AERMV4. [Wording if AER_QTY=1 OR AERMV3f=1] Is the aerator you sold or gave away located in ComEd's service territory?

[Wording if AERMV3f>1] Are all of the aerators you sold or gave away located in ComEd's service territory?

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

[ASK IF AERMV3=2]

AERMV5. Why [was/were] the aerator(s) moved from [their/its] original locations? (MULTIPLE RESPONSE UP TO 7 RESPONSES) [WORDING CHANGE BASED ON AER_QTY]

01. (Equipment failed)
02. (Didn't work properly)

- 03. (Wrong size – too small or too large)
- 04. (Low water flow)
- 05. (Didn't like the color)
- 06. (Didn't like the appearance/unattractive)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

ASK IF AERMV3=2]

AERMV6. What did you replace the aerator(s) with? (MULTIPLE RESPONSE)

- 01. With a new high efficiency aerator
- 02. With a less efficient aerator
- 03. Re-installed old equipment
- 04. Did not replace
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[ASK IF AERMV3a=3 or AERMV3e>0 (BUT NOT DK/REF)]

AERMV7. When do you think you will install the aerator(s) that are in storage? Would you say ... (READ ANSWER LIST)

- 1. Within the next 3 months
- 2. 3 to 6 months from now
- 3. 6 to 12 months from now
- 4. More than a year from now
- 5. Never
- 8. (Don't know)
- 9. (Refused)

AERMV8. Have you installed any more faucet aerators since you received the ones through the program?

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



[ASK IF AERMV8=1, ELSE SKIP TO AERMV11]

AERMV9. How many additional aerators have you installed? [NUMERIC OPEN END up to 999, DK, REF]

AERMV10. How influential was the program in encouraging you to install the additional aerator(s)? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential. [0-10, DK, REF]

AERMV11. Since receiving aerators through the program, have you recommended aerators to anyone else?

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

AERMV12. At the time that you first heard about this program, had you...? (READ LIST UNTIL RESPONDENT SAYS NO)

01. Already been thinking about purchasing aerators?
02. Already begun collecting information about aerators?
03. (Had not thought about purchasing aerators before you first heard about the program)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP IF AERMV12=3,00,98,99]

AERMV13. Just to be sure I understand, did you have specific plans to install aerators before learning about the program?

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

AERMV14. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have purchased and installed the same aerator(s) if you had not received (it/them) through the program? [0-10, DK, REF]

[IF (AERMV13=2 or AERMV12=3) AND (AERMV14<=3) THEN SKIP TO NEXT SECTION]

I'm going to read two statements about the aerators you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

AERMV15. There may have been several reasons for my installation of aerators, but the program was a critical factor in my decision to have the aerators installed. [0-10, DK, REF]

AERMV16. I would have bought aerators within a year of when I did even if I had not received (it/them) from the program. [0-10, DK, REF]

Consistency Check & Resolution

[AERCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) The question responses that will be used to trigger AERCC1 are:

- AERMV14 (how likely is it that you would have bought the same item)
- AERMV15 (program was a critical factor in my decision to install item)
- AERMV16 (would have bought item within a year, without the program)

{IF AERMV14 = 0,1,2 AND AERMV15 = 0,1, 2 AND AERMV16 = 8, 9,10, ASK AERCC1.
INCONSISTENCY1='you would likely not have purchased the aerator(s) without the program'}

{IF AERMV14 = 8, 9,10 AND AERMV15 = 8, 9,10 AND AERMV16 = 0,1, 2, ASK AERCC1.
INCONSISTENCY1= 'you would likely have purchased the aerator(s) without the program'}

{IF AERMV15 = 0,1, 2 AND AERMV14 = 0,1, 2 AND AERMV16= 0,1, 2, ASK AERCC1.
INCONSISTENCY1='the program was not a critical factor in your decision to install the aerator(s)'}

{IF AERMV15 = 8, 9,10 AND AERMV14 = 8, 9,10 AND AERMV16 = 8, 9,10, ASK AERCC1.
INCONSISTENCY1='the program was a critical factor in your decision to install the aerator(s)'}

{IF AERMV16 = 8, 9,10 AND AERMV14 = 0,1, 2 AND AERMV15 = 0, 1,2, ASK AERCC1.
INCONSISTENCY1= 'you would have bought the aerator(s) within a year even without the program'}

{IF AERMV16 = 0,1, 2 AND AERMV14 = 8, 9,10 AND AERMV15 = 8,9, 10, ASK AERCC1.
INCONSISTENCY1='you would not have bought the aerator(s) within a year without the program'}}

AERCC1. Let me make sure I understand you. Earlier, you said [insert inconsistency1], but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision install the aerator(s) at the time you did? [OPEN END, DK, REF]

SH. SHOWERHEAD MEASURE VERIFICATION

[ASK SECTION IF S1c=1]

SMV1. Our records show that [insert SHOW_QTY] low flow showerheads were installed by the ComEd representative during the All Electric Efficiency Upgrade Program's visit to your home. Is this correct? [Note to interviewer: This includes both low flow showerheads and low flow handheld showerheads]

1. Yes, quantity is correct
2. No, quantity is incorrect
8. (Don't know) [SKIP TO NEXT SECTION]
9. (Refused) [SKIP TO NEXT SECTION]

[ASK IF SHOWMV1=2]

SHOWMV2. How many showerheads were installed? [Probe for best estimate] [NUMERIC OPEN END up to 999, DK, REF] [IF DK OR REF, THEN SKIP TO NEXT SECTION] [USE AS SHOW_QTY FOR REMAINDER OF SURVEY]

SHOWMV3. [Wording if SHOW_QTY=1] Is the showerhead still installed in the original location?

[Wording if SHOW_QTY>1] Are all of these showerheads still installed in their original locations?

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

[ASK IF SHOWMV3=2 AND SHOW_QTY=1]



SHOWMV3a. Which of the following best describes what happened with the showerhead?
(READ LIST AND RECORD ONE RESPONSE)

- 01. It is installed at some other location in your home
- 02. It was thrown away
- 03. It is in storage
- 04. It was sold or given away
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[ASK IF SHOWMV3=2 AND SHOW_QTY>1]

Now, I would like to understand what happened to the [insert SHOW_QTY] showerheads.
How many... [SHOW ALL ON SAME SCREEN]

SHOWMV4a. Are currently installed in their original location?

[CHECK IF SHOWMV4A =VERIFIED QUANTITY, THEN SKIP TO SHOWMV10]

SHOWMV4b. Are installed at some other location in your house?

[IF SHOWMVa+b = VERIFIED QUANTITY, THEN SKIP TO SHOWMV7]

SHOWMV4c. Have been thrown away?

[IF SHOWMVa+b+c = VERIFIED QUANTITY, THEN SKIP TO SHOWMV7]

SHOWMV4d. Are in storage?

[IF SHOWMVa+b+c+d = VERIFIED QUANTITY, THEN SKIP TO SHOWMV7]

SHOWMV4e. Were sold or given away?

[NUMERIC OPEN END up to SHOW_QTY, DK, REF]

[IF SHOWMV4a OR SHOWMV4b OR SHOWMV4c OR SHOWMV4d OR SHOWMV4e=98 OR 99 SKIP TO SHOWMV6]

[MEAS_QTY check

IF SHOWMV4a+ SHOWMV4b+ SHOWMV4c+ SHOWMV4d+ SHOWMV4e= SHOW_QTY
then proceed to SHOWMV6.

ELSE IF SHOWMV4a+ SHOWMV4b+ SHOWMV4c+ SHOWMV4d+ SHOWMV4e >
SHOW_QTY

then read "I must have made a mistake, those quantities add up to more than were installed through the program. Let me read through the last few questions again" and skip back to SHOWMV4a

ELSE IF SHOWMV4a+ SHOWMV4b+ SHOWMV4c+ SHOWMV4d+ SHOWMV4e <
SHOW_QTY

then proceed to SHOWMV5]

SHOWMV5. What were done with the remaining [SHOW_QTY -(SHOWMV4a+ SHOWMV4b+ SHOWMV4c+ SHOWMV4d+ SHOWMV4e)] showerheads? [OPEN END, DK, REF]

[ASK IF SHOWMV4e>0 (BUT NOT DK/REF) OR SHOWMV3a=4]

SHOWMV6. [Wording if SHOW_QTY=1 OR SHOWMV4e=1] Is the showerhead you sold or gave away located in ComEd's service territory?

[Wording if SHOWMV4e>1] Are all of the showerheads you sold or gave away located in ComEd's service territory?

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

[ASK IF SHOWMV3 = 2]

SHOWMV7. Why were the showerhead(s) moved from their original location? (MULTIPLE RESPONSE UP TO 7 RESPONSES)

01. (Equipment failed)
02. (Didn't work properly)
03. (Wrong size – too small or too large)
04. (Low water flow)
05. (Didn't like the color)
06. (Didn't like the appearance/unattractive)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF SHOWMV3=2]

SHOWMV8. What did you replace the showerhead(s) you removed with? (MULTIPLE RESPONSE)

01. With a new high efficient shower head
02. With a less efficient showerhead
03. Re-installed old equipment
04. Did not replace
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF SHOWMV3a=3 OR SHOWMV4d>0 (BUT NOT DK/REF)]

SHOWMV9. When do you think you will install the showerhead(s) you put in storage? Would you say ...(READ ANSWER LIST)

1. Within the next 3 months
2. 3 to 6 months from now
3. 6 to 12 months from now
4. More than a year from now
5. Never
8. (Don't know)
9. (Refused)

SHOWMV10. Have you installed any more low-flow showerheads since you received the ones through the program?

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

[ASK IF SHOWMV10=1, ELSE SKIP TO SHOWMV13]

SHOWMV11. How many additional showerheads have you installed? [NUMERIC OPEN END up to 999, DK, REF]

SHOWMV12. How influential was the program in encouraging you to install the additional showerheads? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential. [0-10, DK, REF]

SHOWMV13. Since receiving showerheads through the program, have you recommended low flow showerheads to anyone else?

1. Yes

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

SHOWMV14. At the time that you first heard about this program, had you...? (READ LIST UNTIL RESPONDENT SAYS NO)

- 01. Already been thinking about purchasing low flow showerheads?
- 02. Already begun collecting information about low flow showerheads?
- 03. (Had not thought about purchasing low flow showerheads before you first heard about the program)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[SKIP IF SHOWMV14=3,00,98,99]

SHOWMV15. Just to be sure I understand, did you have specific plans to install low flow showerheads before learning about the program?

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

SHOWMV16. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have purchased and installed the same showerheads if you had not received (it/them) through the program? [0-10, DK, REF]

[IF (SHOWMV15=2 or SHOWMV14=3) AND (SHOWMV 16=<3) THEN SKIP TO NEXT SECTION]

I'm going to read two statements about the showerheads you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

SHOWMV17. There may have been several reasons for my installation of low flow showerheads, but the program was a critical factor in my decision to have the showerheads installed. [0-10, DK, REF]

SHOWMV18. I would have bought low flow showerheads within a year of when I did even if I had not received (it/them) from the program. [0-10, DK, REF]

Consistency Check & Resolution

[SHOWCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) The question responses that will be used to trigger SHOWCC1 are:

- SHOWMV16 (how likely is it that you would have bought the same item)
- SHOWMV17 (program was a critical factor in my decision to install item)
- SHOWMV18 (would have bought item within a year, without the program)

{IF SHOWMV16 = 0,1,2 AND SHOWMV17 = 0,1, 2 AND SHOWMV18 = 8, 9,10, ASK SHOWCC1. INCONSISTENCY1='you would likely not have purchased the showerhead(s) without the program'}

{IF SHOWMV16 = 8, 9,10 AND SHOWMV17 = 8, 9,10 AND SHOWMV18 = 0,1, 2, ASK SHOWCC1. INCONSISTENCY1= 'you would likely have purchased the showerhead(s) without the program'}

{IF SHOWMV17 = 0,1, 2 AND SHOWMV16 = 0,1, 2 AND SHOWMV18 = 0,1, 2, ASK SHOWCC1. INCONSISTENCY1='the program was not a critical factor in your decision to install the showerhead(s) '}

{IF SHOWMV17 = 8, 9,10 AND SHOWMV16 = 8, 9,10 AND SHOWMV18 = 8, 9,10, ASK SHOWCC1. INCONSISTENCY1='the program was a critical factor in your decision to install the showerhead(s) '}

{IF SHOWMV18 = 8, 9,10 AND SHOWMV16 = 0,1, 2 AND SHOWMV17 = 0, 1,2, ASK SHOWCC1. INCONSISTENCY1= 'you would have bought the showerhead(s) within a year even without the program'}

{IF SHOWMV18 = 0,1, 2 AND SHOWMV16 = 8, 9,10 AND SHOWMV17= 8,9, 10, ASK SHOWCC1. INCONSISTENCY1='you would not have bought the showerhead(s) within a year without the program'}}

SHOWCC1. Let me make sure I understand you. Earlier, you said [insert inconsistency1], but that differs from some of your other responses. Please tell me in your own words what



influence, if any, the program had on your decision install the showerhead(s) at the time you did? [OPEN END, DK, REF]

NEW ADOPTIONS

NA1. Since participating in the ComEd All Electric Efficiency Upgrade program have you made any other changes to the appliances, equipment or other characteristics of your home that would affect how much energy you are using, besides those we have already discussed?

1. Yes
2. No [SKIP TO EE1]
8. (Don't know) [SKIP TO EE1]
9. (Refused) [SKIP TO EE1]

NA2. What changes did you make?
[OPEN END, DK, REF]

NA3. Did you receive a rebate for this change through a ComEd program?

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

NA5. How influential was the visit from ComEd in encouraging you to [insert response to NA2]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

[0-10, DK, REF]

ENERGY EFFICIENT PRACTICES

EE1. OK. Now I'd like to talk about other types of regular actions people take around their home to use energy more efficiently. These are more behavioral in nature than the types of improvements we just discussed. Since the energy efficient products (e.g., CFLs, faucet aerators, low-flow showerheads) were installed in your home, have you taken any new energy conservation actions to reduce your overall energy use, such as routinely turning off lights or setting the thermostat higher when using the air conditioner?

1. Yes



2. No [SKIP TO OA1]
8. (Don't know) [SKIP TO OA1]
9. (Refused) [SKIP TO OA1]

EE2. What changes did you make?

00. (Open End)
98. (Don't know) [SKIP TO OA1]
99. (Refused) [SKIP TO OA1]

EE4. How influential was the visit from ComEd in encouraging you to make this change? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.
[0-10, DK, REF]

OTHER PROGRAM AWARENESS

OA4. Since participating in this program, have you participated in any other ComEd programs?

1. Yes
2. No [SKIP TO P1]
8. (Don't know) [SKIP TO P1]
9. (Refused) [SKIP TO P1]

OA5. Which ComEd program have you participated in?

[OPEN END, DK, REF]

PROCESS QUESTIONS

Next I have some questions about your experiences with the ComEd Multi-Family All Electric Efficiency Upgrade Program.

MK1. Do you recall seeing or receiving any marketing materials or other information notifying you about the All Electric Efficiency Upgrade program?

1. Yes
2. No [SKIP TO MK4]
- 8 (Don't know/refused) [SKIP TO MK4]

MK2. What types of marketing materials do you remember? [MULTIPLE RESPONSE, UP TO 4]

- 01. (Sign/flyer/poster in building's common space)
- 02. (Flyer in mailbox)
- 03. (Flyer under door)
- 00. (Other, please specify)
- 98. (Don't know/Refused)

MK3a. Thinking about the materials you saw or received, how useful were the materials in providing information about the program? Would you say they were...

- 1Very useful
- 2Somewhat useful
- 3Not very useful
- 4Not at all useful
- 8(Don't know/Refused)

[SKIP IF M3a=1,2,5]

MK3b. What would have made the materials more useful to you? [MULTIPLE RESPONSE, UP TO 3]

- 01 (More detailed information)
- 02 (Where to get additional information)
- 00(Other, specify ALLOW FOR THREE OTHER RESPONSES)
- 98 (Don't know)
- 99 (Refused)

MK4. How would you suggest ComEd try to reach out to their customers to get them to participate in this program? [MULTIPLE RESPONSE]

- 01(With representatives)
- 02(With phone calls)
- 03(With flyers/ads/mailings)
- 04(With bill inserts)
- 05(Contact landlord/building manager)
- 00(Other, specify)
- 98(Don't know)

Customer experience and satisfaction



I'll now ask you to rate your experience with the visit on a scale from 0 to 10 where 10 is a high rating and 0 is a low rating. For example, if I ask about your level of satisfaction 0 would mean very dissatisfied and 10 would mean very satisfied. If you are unsure about the meaning of the scale for any of the questions, just let me know.

SAT1. On a scale of 0 to 10, how would you rate... (0 through 10, 11=DK)

- a. ... your satisfaction with the installed items [CFLs, aerator, showerhead] (0=very dissatisfied; 10=very satisfied)
- b. ... your satisfaction with the report you received at the end of the visit (0=very dissatisfied; 10=very satisfied)
- c. ... your overall satisfaction with the visit (0=very dissatisfied; 10=very satisfied)
- d. ...your overall satisfaction with the Honeywell Service Representative (0=very dissatisfied; 10=very satisfied) [NOTE TO INTERVIEWER: If the respondent is confused, explain that Honeywell is contracted by ComEd to visit the building and install the equipment]
- e. ...your overall satisfaction with the All Electric Efficiency Upgrade Program
- f. ... your overall satisfaction with ComEd (0=very dissatisfied; 10= very satisfied)

[FOR EACH S1a-i<4 FOLLOW UP WITH S2a-i]

SAT2a-i. Why did you rate it that way?

00. OPEN END
98. (Don't know)

SAT3a. Have you ever experienced any problems with the program's staff or the equipment installed in your home?

1. Yes, experienced a problem with the program staff
2. Yes, experienced a problem with the installed equipment
3. Yes, experienced a problem with the staff and equipment
4. Did not experience any problems
8. (Don't know)
9. (Refused)

[ASK IF S3a=1,2,3, ELSE SKIP TO S4]

SAT3b. Did you complain about the problem?

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



[ASK IF S3b=1]

SAT3c. To whom did you complain?

01. My building manager or building owner
02. ComEd Program Staff
03. (Honeywell program staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF S3b=1]

SAT3d. Was the issue resolved to your satisfaction?

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

SAT4. Have you noticed any savings on your electric bill since the visit?

1. Yes
2. No
3. (Not applicable/don't pay the bill)
8. (Don't know)
9. (Refused)

SAT5. Did you fill out and mail the customer survey that the Honeywell energy specialist left with you?

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

DEMOGRAPHICS/HOME CHARACTERISTICS

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

D1. Do you own or rent your home?

1. Own
2. Rent/Lease

- 8. (Don't Know)
- 9. (Refused)

[ASK IF D1 = 2, ELSE D3]

D2. 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)

D3. How many people live in your household year-round?

[NUMERIC OPEN END]

- 98. (Don't Know)
- 99. (Refused)

D4. Do you pay your own water bill or is it included in your rent?

- 1. Pay bill
- 2. Included in Rent
- 8. (Don't Know)
- 9. (Refused)

OC1. Including yourself, how many people currently live in your home in the following age ranges?

...Less than 18 years old [NUMERIC OPEN END up to 99, DK, REF]

OC2 ...18-24 years old [NUMERIC OPEN END up to 99, DK, REF]

OC3 ...25-34 years old [NUMERIC OPEN END up to 99, DK, REF]

OC4 ...35-44 years old [NUMERIC OPEN END up to 99, DK, REF]

OC5 ...45-54 years old [NUMERIC OPEN END up to 99, DK, REF]

OC6 ...55-64 years old [NUMERIC OPEN END up to 99, DK, REF]

OC7 ...65 or older [NUMERIC OPEN END up to 99, DK, REF]

HC3. How many full or half bathrooms do you have in your home? (PROBE: A full bathroom is one that has a sink with running water, and a toilet, and either a bathtub or shower. A half bathroom has either a toilet or a bathtub or a shower) [NUMERIC OPEN END up to 99, DK, REF]

HC6. [ASK IF SHOWERHEAD=1] In total, how many showers are present in your home?



[NUMERIC OPEN END up to 99, DK, REF]

HC7. [ASK IF KITCHEN AERATOR=1] How many faucets are there in your *kitchen*?

[NUMERIC OPEN END up to 99, DK, REF]

HC8. [ASK IF AERATOR=1] Now thinking about your home's bathrooms, how many faucets are there, all together, in all of your home's *bathrooms*?

[NUMERIC OPEN END up to 99, DK, REF]

HC9. [ASK IF CFL=1] Before participating in the program, approximately how many of the screw-in light bulb fixtures in your home were already equipped with CFL bulbs?

96. (None)

00. (NUMERIC OPEN END up to 95)

98. (Don't know)

99. (Refused)

HC15. [ASK IF SHOWERHEAD=1] How long is the average shower taken in your home? (In minutes)

[NUMERIC OPEN END up to 97, DK, REF]

HC16. [SHOWERHEAD=1] All combined, how many showers do you and your family members take per week?

[NUMERIC OPEN END up to 97, DK, REF]

D6a. Was your total family income in 2009 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 D6a=1, ELSE D6c]

D6b. 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 D6a=2, ELSE D7]

D6c. 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)

D7. What is the highest level of education you have completed?

01. Less than high school
02. High school graduate or equivalent (e.g., GED)
03. Attended some college (includes junior/community college)
04. Bachelors degree
05. Advanced degree
00. (Other, Specify)
98. (Don't know)
99. (Refused)

Those are all the questions I have. On behalf of ComEd, thank you very much for your time.

**COMED MULTIFAMILY ALL-ELECTRIC EFFICIENCY UPGRADE PROGRAM
PARTICIPATING BUILDING MANAGER/OWNER SURVEY
August 25, 2010 DRAFT**

INTRODUCTION AND SCREENER

Hello, this is [INTERVIEWER'S NAME] from Opinion Dynamics calling on behalf of ComEd. This is not a sales call. We are contacting building owners and managers who have participated in ComEd's All-Electric Efficiency Upgrade Program. May I please speak with [CONTACT_NAME]? [If needed: This program included an audit of your building common



areas and direct installation of compact fluorescent lamps, faucet aerators and showerheads in the living units.]

We are contacting participating building owners and managers to learn about your experiences with the energy survey of building common areas and the free installation of CFLs, showerheads, and faucet aerators your residents received as part of the All-Electric Efficiency Upgrade Program offered by ComEd. I'd like to assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone.

Are you the person who was most familiar with the upgrades? (If not may I please speak with the person who was most familiar with the upgrades?) [REPEAT INTRO WITH CORRECT PERSON]

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

For the purposes of this survey, these questions refer to the audit and installations performed only at <Address>. Throughout this survey, I'm going to refer to your apartment or condominium complex as your 'facility'.

AUDIT VERIFICATION

AV1. Do you remember receiving an assessment of your common areas with energy saving recommendations as part of this program? (If needed: All-Electric Efficiency Upgrade Program)

1. Yes
2. No [SKIP TO MV0]
8. (Don't know) [SKIP TO MV0]
9. (Refused) [SKIP TO MV0]

AV2. What recommendations do you remember receiving from the ComEd representative that visited your facility?

00. (Open end)
98. (Don't know) [SKIP TO MV0]
99. (Refused) [SKIP TO MV0]

AV3. Have you implemented any of the recommendations?

1. Yes
2. No [SKIP TO AV6]
8. (Don't know) [SKIP TO AV6]

9. (Refused) [SKIP TO AV6]

AV4. Which recommendations have you implemented?
[OPEN END, DK, REF]

AV5. Did you receive a rebate for this recommendation through a ComEd program?

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

AV6. Do you have plans to implement any of the recommendations in the future?

1. Yes
2. No [SKIP TO MV0]
8. (Don't know) [SKIP TO MV0]
9. (Refused) [SKIP TO MV0]

AV7. Which one(s)?

[OPEN END, DK, REF]

98. (Don't know)

99. (Refused)

DIRECT INSTALL MEASURE VERIFICATION (CFL, Faucet Aerators, Low Flow Showerhead)

[Use MV0 to determine the variable ELECTRIC_BILL=party responsible for paying the individual apartment/condo unit electric bill]

= *Owner/Manager*

= *Resident/Unknown*

MV0. Which party is responsible for paying the electric bill of individual living units?

1. Tenant or resident pays [Set as ELECTRIC_BILL=Resident/Unknown]
2. Landlord/owner/building manager pays [Set as ELECTRIC_BILL=Owner/Manager]
8. (Don't know) [Set as ELECTRIC_BILL=Resident/Unknown]
9. (Refused) [Set as ELECTRIC_BILL=Resident/Unknown]



We would now like to ask you about the upgrades you received through the program.

CFL VERIFICATION

CFLMV1. Our records show that CFLs were installed in resident spaces by the ComEd representative during ComEd’s visit to your facility. Is this correct?

1. Yes [SKIP TO CFLMV6]
2. No , we did not receive any CFLs [SKIP TO NEXT SECTION]
8. (Don’t know) [SKIP TO NEXT SECTION]
9. (Refused) [SKIP TO NEXT SECTION]

CFLMV6. To your knowledge, are all of the CFLs received from the program in your building still installed in their original locations?

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

[ASK IF CFLMV6 =2]

CFLMV7. Which of the following best describes what happened to the CFLs that are no longer installed in their original locations? (READ LIST AND RECORD ONE RESPONSE)

01. They are installed at some other locations in the building
02. They were thrown away
03. They are in storage
04. They were sold or given away
05. They were recycled using an approved CFL recycling program
00. (Other, specify)
98. (Don’t know)
99. (Refused)

[ASK IF CFLMV6=2]

CFLMV16. Why [were the CFLs/was the CFL] moved from [their/its] original location? (MULTIPLE RESPONSE UP TO 7 RESPONSES)

01. (Equipment failed)
02. (Didn’t work properly)
03. (Wrong size – too small or too large)

- 04. (Didn't like the color)
- 06. (Didn't like the appearance/unattractive)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[ASK IF CFLMV6=2] – Multiple Response up to 2

CFLMV17. What were the CFLs replaced with?

- 01. (With a new CFL)
- 02. (With an incandescent bulb)
- 04. (Did not replace)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

CFLMV19. Have you installed any more CFLs in your building since you received the ones through the program?

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

[ASK IF CFLMV19=1, ELSE SKIP TO CFLMV22]

CFLMV20. How many additional CFLs have you installed? [NUMERIC OPEN END up to 999, DK, REF]

CFLMV21. How influential was the program in encouraging you to install the additional CFL(s)? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential. [0-10, DK, REF]

CFLMV22. Since receiving CFLs from the program, have you recommended CFLs to anyone else?

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



CFLMV23. At the time that you first heard about this program, had you...? (READ LIST Mult. Response)

01. Already been thinking about purchasing CFLs?
02. Already begun collecting information about CFLs?
03. (Had not thought about purchasing CFLs before you first heard about the program)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP IF CFLMV23=3,0,98,99]

CFLMV24. Just to be sure I understand, did you have specific plans to install CFLs before learning about the program?

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

CFLMV25. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have purchased and installed CFLs if you had not received (it/them) through the program? [0-10, DK, REF]

[IF (CFLMV24=2 OR CFLMV23=3) AND (CFLMV25<=3) THEN SKIP TO NEXT SECTION]

I'm going to read two statements about the CFLs you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

CFLMV26. There may have been several reasons for my installation of CFLs, but the program was a critical factor in my decision to have the CFLs installed. [0-10, DK, REF]

CFLMV27. I would have bought CFLs within a year of when I did even if I had not received (it/them) from the program. [0-10, DK, REF]

Consistency Check & Resolution

[CFLCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership



while one question is at the other spectrum.) The question responses that will be used to trigger CFLCC1 are:

- CFLMV25 (how likely is it that you would have bought the same item)
- CFLMV26 (program was a critical factor in my decision to install item)
- CFLMV27 (would have bought item within a year, without the program)

{IF CFLMV25 = 0,1,2 AND CFLMV26 = 0,1, 2 AND CFLMV27 = 8, 9,10, ASK CFLCC1.
INCONSISTENCY1='you would likely not have installed the CFLs without the program but that differs from when you said the program was not a critical factor and you would install the CFLs within a year'}

{IF CFLMV25 = 8, 9,10 AND CFLMV26 = 8, 9,10 AND CFLMV27 = 0,1, 2, ASK CFLCC1.
INCONSISTENCY1='you would likely have installed the CFLs without the program but that differs from your response that the program was a critical factor and you would not have installed the CFLs within the year'}

{IF CFLMV26 = 0,1, 2 AND CFLMV25 = 0,1, 2 AND CFLMV27 = 0,1, 2, ASK CFLCC1.
INCONSISTENCY1='the program was not a critical factor in your decision to install the CFLs but that differs from your response that you would not have installed the CFLs within the year'}
{IF CFLMV26 = 8, 9,10 AND CFLMV25 = 8, 9,10 AND CFLMV27 = 8, 9,10, ASK CFLCC1.
INCONSISTENCY1='the program was a critical factor in your decision to install the CFLs but that differs from your response that you would have installed CFLs within the year without the program'}

{IF CFLMV27 = 8, 9,10 AND CFLMV25 = 0,1, 2 AND CFLMV26 = 0,1,2, ASK CFLCC1.
INCONSISTENCY1='you would not have installed the CFLs within the year but that differs from your response that the program was not a critical factor and you were likely to install the CFLs without the program'}

{IF CFLMV27 = 0,1, 2 AND CFLMV25 = 8, 9,10 AND CFLMV26 = 8,9,10, ASK CFLCC1.
INCONSISTENCY1='you would have installed the CFLs within the year but that differs from your response that you were not likely to install the CFLs and the program was a critical factor'}}

CFLCC1. Let me make sure I understand you. Earlier, you said [insert inconsistency1], but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision install the CFLs at the time you did? [OPEN END, DK, REF]



FA. FAUCET AERATOR MEASURE VERIFICATION

AERMV1. Our records show that faucet aerators were installed in resident spaces by the ComEd representative during ComEd's visit to your facility. Is this correct?

1. Yes [SKIP TO AERMV3]
2. No , we did not receive any CFLs [SKIP TO NEXT SECTION]
8. (Don't know) [SKIP TO NEXT SECTION]
9. (Refused) [SKIP TO NEXT SECTION]

AERMV3. To your knowledge, are all of the faucet aerators still installed in their original locations?

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

[ASK IF AERMV3 =2]

AERMV3a. Which of the following best describes what happened with the faucet aerators that are no longer installed in their original locations? (READ LIST AND RECORD ONE RESPONSE)

01. They were installed at some other location in the building
02. They were thrown away
03. They are in storage
04. They were sold or given away
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF AERMV3=2]

AERMV5. Why were the aerators moved from their original locations? (MULTIPLE RESPONSE UP TO 7 RESPONSES)

01. (Equipment failed)
02. (Didn't work properly)
03. (Wrong size – too small or too large)
04. (Low water flow)
05. (Didn't like the color)
06. (Didn't like the appearance/unattractive)
00. (Other, specify)

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

ASK IF AERMV3=2] mult resp up to 4
AERMV6. What were the aerators replaced with?

- 01. With a new high efficiency aerator
- 02. With a less efficient aerator
- 03. Re-installed old equipment
- 04. Did not replace
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

AERMV8. Have you installed any more faucet aerators since you received the ones through the program?

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

[ASK IF AERMV8=1, ELSE SKIP TO AERMV11]

AERMV9. How many additional aerators have you installed? [NUMERIC OPEN END up to 999, DK, REF]

AERMV10. How influential was the program in encouraging you to install the additional aerator(s)? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential. [0-10, DK, REF]

AERMV11. Since receiving aerators through the program, have you recommended aerators to anyone else?

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



AERMV12. At the time that you first heard about this program, had you...? (READ LIST UNTIL RESPONDENT SAYS NO)

- 01. Already been thinking about purchasing aerators?
- 02. Already begun collecting information about aerators?
- 03. (Had not thought about purchasing aerators before you first heard about the program)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

[SKIP IF AERMV12=3,00,98,99]

AERMV13. Just to be sure I understand, did you have specific plans to install aerators before learning about the program?

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

AERMV14. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have purchased and installed the same aerator(s) if you had not received (it/them) through the program? [0-10, DK, REF]

[IF (AERMV13=2 or AERMV12=3) AND (AERMV14<=3) THEN SKIP TO NEXT SECTION]

I'm going to read two statements about the aerators you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

AERMV15. There may have been several reasons for my installation of aerators, but the program was a critical factor in my decision to have the aerators installed. [0-10, DK, REF]

AERMV16. I would have bought aerators within a year of when I did even if I had not received (it/them) from the program. [0-10, DK, REF]

Consistency Check & Resolution

[AERCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) The question responses that will be used to trigger AERCC1 are:

- AERMV14 (how likely is it that you would have bought the same item)
- AERMV15 (program was a critical factor in my decision to install item)
- AERMV16 (would have bought item within a year, without the program)

{IF AERMV14 = 0,1,2 AND AERMV15 = 0,1, 2 AND AERMV16 = 8, 9,10, ASK AERCC1.
INCONSISTENCY1='you would likely not have installed the aerators without the program but that differs from when you said the program was not a critical factor and you would install the aerators within a year'}

{IF AERMV14 = 8, 9,10 AND AERMV15 = 8, 9,10 AND AERMV16 = 0,1, 2, ASK AERCC1.
INCONSISTENCY1= 'you would likely have installed the aerators without the program but that differs from your response that the program was a critical factor and you would not have installed the aerators within the year'}

{IF AERMV15 = 0,1, 2 AND AERMV14 = 0,1, 2 AND AERMV16= 0,1, 2, ASK AERCC1.
INCONSISTENCY1='the program was not a critical factor in your decision to install the aerators but that differs from your response that you would not have installed the aerators within the year'}

{IF AERMV15 = 8, 9,10 AND AERMV14 = 8, 9,10 AND AERMV16 = 8, 9,10, ASK AERCC1.
INCONSISTENCY1='the program was a critical factor in your decision to install the aerators but that differs from your response that you would have installed aerators within the year without the program'}

{IF AERMV16 = 8, 9,10 AND AERMV14 = 0,1, 2 AND AERMV15 = 0,1, 2, ASK AERCC1.
INCONSISTENCY1='you would not have installed the aerators within the year but that differs from your response that the program was not a critical factor and you were likely to install the aerators without the program'}

{IF AERMV16 = 0,1, 2 AND AERMV14 = 8, 9,10 AND AERMV15 =8, 9,10, ASK AERCC1.
INCONSISTENCY1='you would have installed the aerators within the year but that differs from your response that you were not likely to install the aerators and the program was a critical factor']}]

AERCC1. Let me make sure I understand you. Earlier, you said [insert inconsistency1], but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision install the aerator(s) at the time you did? [OPEN END, DK, REF]

SH. SHOWERHEAD MEASURE VERIFICATION

SHOWMV1. Our records show that a low-flow showerhead was installed in resident spaces by the ComEd representative during ComEd's visit to your facility. Is this correct?

1. Yes [SKIP TO SHOWMV3]
2. No , we did not receive any showerheads [SKIP TO NEXT SECTION]
8. (Don't know) [SKIP TO NEXT SECTION]
9. (Refused) [SKIP TO NEXT SECTION]

SHOWMV3. To you knowledge, are all of these showerheads still installed in their original locations?

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

[ASK IF SHOWMV3=2]

SHOWMV3a. Which of the following best describes what happened with the showerheads not still installed in their original locations? (READ LIST AND RECORD ONE RESPONSE)

01. They were installed at some other location in the building
02. They were thrown away
03. They are in storage
04. They were sold or given away
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK IF SHOWMV3 = 2]

SHOWMV7. Why were the showerheads moved from their original location? (MULTIPLE RESPONSE UP TO 7 RESPONSES)

01. (Equipment failed)
02. (Didn't work properly)
03. (Wrong size – too small or too large)
04. (Low water flow)
05. (Didn't like the color)
06. (Didn't like the appearance/unattractive)
00. (Other, specify)
98. (Don't know)

99. (Refused)

[ASK IF SHOWMV3=2]

SHOWMV8. What were the showerheads replaced with? Mult resp up to 4

- 01. With a new high efficient shower head
- 02. With a less efficient showerhead
- 03. Re-installed old equipment
- 04. Did not replace
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

SHOWMV10. Have you installed any more low-flow showerheads since you received the ones through the program?

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

[ASK IF SHOWMV10=1, ELSE SKIP TO SHOWMV13]

SHOWMV11. How many additional showerheads have you installed? [NUMERIC OPEN END up to 999, DK, REF]

SHOWMV12. How influential was the program in encouraging you to install the additional showerheads? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential. [0-10, DK, REF]

SHOWMV13. Since receiving showerheads through the program, have you recommended low flow showerheads to anyone else?

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

SHOWMV14. At the time that you first heard about this program, had you...? (READ LIST UNTIL RESPONDENT SAYS NO)

01. Already been thinking about purchasing low flow showerheads?
02. Already begun collecting information about low flow showerheads?
03. (Had not thought about purchasing low flow showerheads before you first heard about the program)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP IF SHOWMV14=3,00,98,99]

SHOWMV15. Just to be sure I understand, did you have specific plans to install low flow showerheads before learning about the program?

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

SHOWMV16. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have purchased and installed the same showerheads if you had not received (it/them) through the program? [0-10, DK, REF]

[IF (SHOWMV15=2 or SHOWMV14=3) AND (SHOWMV 16=<3) THEN SKIP TO NEXT SECTION]

I'm going to read two statements about the showerheads you received. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

SHOWMV17. There may have been several reasons for my installation of low flow showerheads, but the program was a critical factor in my decision to have the showerheads installed. [0-10, DK, REF]

SHOWMV18. I would have bought low flow showerheads within a year of when I did even if I had not received (it/them) from the program. [0-10, DK, REF]

Consistency Check & Resolution

[SHOWCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership

while one question is at the other spectrum.) The question responses that will be used to trigger SHOWCC1 are:

- SHOWMV16 (how likely is it that you would have bought the same item)
- SHOWMV17 (program was a critical factor in my decision to install item)
- SHOWMV18 (would have bought item within a year, without the program)

{IF SHOWMV16 = 0,1,2 AND SHOWMV17 = 0,1, 2 AND SHOWMV182 = 8, 9,10, ASK SHOWCC1. INCONSISTENCY1='you would likely not have installed the showerheads without the program but that differs from when you said the program was not a critical factor and you would install the showerheads within a year'}

{IF SHOWMV16 = 8, 9,10 AND SHOWMV17 = 8, 9,10 AND SHOWMV18 = 0,1, 2, ASK SHOWCC1. INCONSISTENCY1= 'you would likely have installed the showerheads without the program but that differs from your response that the program was a critical factor and you would not have installed the showerheads within the year'}

{IF SHOWMV17 = 0,1, 2 AND SHOWMV16 = 0,1, 2 AND SHOWMV18 = 0,1, 2, ASK SHOWCC1. INCONSISTENCY1='the program was not a critical factor in your decision to install the showerheads but that differs from your response that you would not have installed the showerheads within the year'}

{IF SHOWMV17 = 8, 9,10 AND SHOWMV6 = 8, 9,10 AND SHOWMV18 = 8, 9,10, ASK SHOWCC1. INCONSISTENCY1='the program was a critical factor in your decision to install the showerheads but that differs from your response that you would have installed showerheads within the year without the program'}

{IF SHOWMV18 = 8, 9,10 AND SHOWMV6 = 0,1, 2 AND SHOWMV17 = 0,1, 2, ASK SHOWCC1. INCONSISTENCY1= 'you would not have installed the showerheads within the year but that differs from your response that the program was not a critical factor and you were likely to install the showerheads without the program'}

{IF SHOWMV18 = 0,1, 2 AND SHOWMV16 = 8, 9,10 AND SHOWMV17= 8, 9,10 ASK SHOWCC1. INCONSISTENCY1='you would have installed the showerheads within the year but that differs from your response that you were not likely to install the showerheads and the program was a critical factor'}}

SHOWCC1. Let me make sure I understand you. Earlier, you said [insert inconsistency1], but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision install the showerhead(s) at the time you did? [OPEN END, DK, REF]



NEW ADOPTIONS

NA1. Since participating in the ComEd All Electric Efficiency Upgrade program have you made any other changes to the appliances, equipment or other characteristics of your facility that would affect how much energy it is using, besides those we have already discussed?

1. Yes
2. No [SKIP TO EE1]
8. (Don't know) [SKIP TO EE1]
9. (Refused) [SKIP TO EE1]

NA2. What changes did you make?
[OPEN END, DK, REF]

NA3. Did you receive a rebate for this change through a ComEd program?

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

NA4. (Skip to QEE1 if DK/REF NA2) Which one of the following were recommended on the facility assessment? (READ: [insert response to NA2])

96. None of these
00. (Other, specify)
98. (Don't know)
99. (Refused)

NA5. How influential was the facility assessment in encouraging you to [insert response to NA2]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

[0-10, DK, REF]

ENERGY EFFICIENT PRACTICES

EE1. OK. Now I'd like to talk about other types of regular actions people take around their facilities to use energy more efficiently. These are more behavioral in nature than the types

of improvements we just discussed. Since participating in ComEd's program have you taken any new energy conservation actions to reduce your overall energy use, such as routinely turning off lights or setting the thermostat higher when using the air conditioner?

1. Yes
2. No [SKIP TO OA1]
8. (Don't know) [SKIP TO OA1]
9. (Refused) [SKIP TO OA1]

EE2. What changes did you make?

00. (Open End)
98. (Don't know) [SKIP TO OA1]
99. (Refused) [SKIP TO OA1]

EE3. Which one of the following were recommended on the facility assessment? (READ: [insert response to EE2])

96. None of these
00. (Other, specify)
98. (Don't know)
99. (Refused)

EE4. How influential was the facility assessment in encouraging you to make this change?
Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

[0-10, DK, REF]

OTHER PROGRAM AWARENESS

[SKIP IF AV1=2,8,9]

OA1. At the time of the common area assessment, did the auditor give you any information about any other ComEd programs?

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



OA3. What other ComEd programs are you aware of? [MULTIPLE RESPONSES, UP TO 3]

- 96. No other [SKIP TO MK1]
- 00. (Other, specify)
- 98. (Don't know) [SKIP TO MK1]
- 99. (Refused) [SKIP TO MK1]

OA4. Have you participated in any other ComEd programs?

- 1. Yes
- 2. No [SKIP TO MK1]
- 8. (Don't know) [SKIP TO MK1]
- 9. (Refused) [SKIP TO MK1]

OA5. Which ComEd program have you participated in?

[OPEN END, DK, REF]

PROCESS QUESTIONS

Next I have some questions about your experiences with the ComEd Multi-Family All Electric Efficiency Upgrade Program.

MK1. How did you first hear about the program?

- 01. (Direct contact with ComEd/Honeywell program staff)
- 02. (Brochure/flyer)
- 03. (Bill insert)
- 04. (Internet)
- 05. (Word of mouth)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

MK4. How would you suggest ComEd try to reach out to their customers to get them to participate in this program? [MULTIPLE RESPONSE]

- 01. (With representative)
- 02. (With phone calls)
- 03. (With flyers/ads/mailings)
- 04. (With bill inserts)



- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

Customer experience and satisfaction

I'll now ask you to rate your experience with the visit on a scale from 0 to 10 where 10 is a high rating and 0 is a low rating. For example, if I ask about your level of satisfaction 0 would mean very dissatisfied and 10 would mean very satisfied. If you are unsure about the meaning of the scale for any of the questions, just let me know. [SCALE 0-10; 96=not applicable, 98=Don't know, 99=Refused]

S1. On a scale of 0 to 10, how would you rate...

- g. ... your satisfaction with the energy saving equipment installed in your facility through the program (CFLs, aerators, showerheads)
- h. ... your satisfaction with the facility report you received that showed recommended ways to save energy
- i. ...the time it took to schedule the facility assessment
- j. ... your overall satisfaction with the visit
- k. ...your overall satisfaction with the Honeywell Service Representative [NOTE TO INTERVIEWER: If the respondent is confused, explain that Honeywell is contracted by ComEd to visit the building and install the equipment]
- l. ...your overall satisfaction with the All Electric Efficiency Upgrade Program
- m. ... your overall satisfaction with ComEd

[FOR EACH S1a-i<4 FOLLOW UP WITH S2a-i]

S1aa-gg. Why did you rate it that way?

- 01. OPEN END
- 98. (Don't know)
- 99. (Refused)

S2a. On a scale of 0 to 10, how would you rate your residents' satisfaction with the program? [0-10, DK, REF]

[ASK IF S3a-i<4]

S2aa. Why are they not satisfied?

- 00. OPEN END



98. (Don't know)

99. (Refused)

S3a. Have any residents complained about the program or the equipment installed through the program?

1. Yes

2. No [SKIP TO S4]

8. (Don't know) [SKIP TO S4]

9. (Refused) [SKIP TO S4]

[ASK IF S3a=1]

S3b. How do you handle the complaints?

01. (Replace equipment)

02. (Change equipment back to previous equipment)

03. (Call ComEd/Honeywell)

00. (Other, specify)

98. (Don't know)

99. (Refused)

S4. What do you see as the main benefits to participating in the program?

00. OPEN END

98. (Don't know)

99. (Refused)

S5. What do you see as the main drawbacks to participating in the program?

00. OPEN END

98. (Don't know)

99. (Refused)

S6. How could the program be improved?

00. OPEN END

98. (Don't know)

99. (Refused)

BUILDING CHARACTERISTICS

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



F1. How many units are in your building?

[NUMERIC OPEN END, DK, REF]

F2a How old is this facility? (In years) [NUMERIC OPEN END, 0 TO 150; 998=Don't know, 999=Refused]

[ASK F2b IF F2a=998]

F2b Do you know the approximate age? Would you say it is...

1. Less than 2 years
2. 2-4 years
3. 5-9 years
4. 10-19 years
5. 20-29 years
6. 30 years or more years
8. (Don't know)
9. (Refused)

F3 Which of the following best describes the facility? This facility is...

1. The property management's only location
2. one of several locations owned by the property management
8. (Don't know)
9. (Refused)

[ask if F3 =2] F4 To your knowledge, have other locations owned by the property management firm participated in the ComEd Multi-Family All Electric Efficiency Upgrade Program?

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

Those are all the questions I have. On behalf of ComEd, thank you very much for your time.

5.2 *Default Savings Memo*

The following memo documents evaluator recommendations for default savings.



ComEd PY2 Default
Values Review All Ele