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AMERICAN® ELECTRIC POWER

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Ms. Renee J. Jenkins
Secretary of the Commission
Public Utilities Commission of Ohio
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Columbus, Ohio 43215-3793

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RE: *In the Matter of the Annual Portfolio Status Report Under Rule 4901:1-39-05(C), Ohio Administrative Code, by Columbus Southern Power Company*, Case No. 10-318-EL-EEC and *In the Matter of the Annual Portfolio Status Report Under Rule 4901:1-39-05(C), Ohio Administrative Code, by Ohio Power Company*, Case No. 10-321- EL-EEC.

Dear Ms. Jenkins:

I am submitting the enclosed 2009 Portfolio Status Report on behalf of Columbus Southern Power Company and Ohio Power Company, pursuant to Rule 4901:1-39-05(C), Ohio Administrative Code (OAC). Please note that the Report is broken into two volumes, due to the size of the supporting documentation. Volume I contains the narrative body of the Report; Appendix A (the compliance affidavit required by Rule 4901:1-39-05(C)(1)(c), OAC; and Report Appendices B through D. Volume II contains the remaining Report Appendices E through G.

Thank you for you attention to this matter.

Respectfully Submitted,

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FILE

COLUMBUS SOUTHERN POWER COMPANY AND OHIO POWER COMPANY

2009 PORTFOLIO STATUS REPORT OF ENERGY EFFICIENCY AND PEAK DEMAND RESPONSE PROGRAMS

VOLUME I

TABLE OF CONTENTS

INTRODUCTION

In Case No. 08-888-EL-ORD, the Public Utilities Commission of Ohio (Commission) approved Rules for Energy Efficiency (EE) and Peak Demand Reduction (PDR) Programs of electric utilities (Rules). The Rules became effective on December 10, 2009. Consistent with Senate Bill 221 (SB 221), the Rules require that each electric utility within the jurisdiction of the Commission implement energy efficiency and peak demand reduction programs and file an annual Portfolio Status Report by March 15 of each year. Per Ohio Administrative Code (OAC) 4901:1-39-05(C), the Status Report must address the performance of all approved energy efficiency and peak-demand reduction programs in its program portfolio plan over the previous calendar year. Columbus Southern Power Company (CSP) and Ohio Power Company (OPCo) (collectively, "the Companies" or "AEP Ohio") filed a Program Portfolio Plan in Case Nos. 09-1089-EL-POR and 09-1090-EL-POR, which remain pending.

AEP Ohio submits this 2009 Portfolio Status Report to comply with the Rules. Consistent with OAC 4901:1-39-05(C)(2)(b), the Companies contracted with Navigant Consulting, Inc., (Navigant) to review the programs, perform the impact and process evaluations of the 2009 programs, and provide an evaluation, measurement and verification report.

AEP Ohio has organized the report into six sections. These include the Introduction, Benchmark Report Update, Benchmark Achievement, Program Descriptions, Portfolio Plan Update, and Appendices. The Appendices include the Compliance Affidavit and the Evaluation, Measurement, and Verification Reports for each of the six programs, prepared by the third party independent program evaluator, Navigant Consulting, Inc.

INITIAL BENCHMARK REPORT UPDATE

In Case No. 10-153-EL-EEC, AEP Ohio filed the required Initial Benchmark Report on February 8, 2010. The Commission mandated the filing date for this report in the Rules. Each year, electric utilities are required to update the Initial Benchmark Report. When AEP Ohio filed the Initial Benchmark Report, it did not yet know the full impact of the resources that mercantile customers were committing to AEP Ohio through the Self-Direct Program.

SB 221 allows mercantile customers who completed projects during the baseline period to commit customer-sited resources toward their electric utility's compliance with the SB 221 EE/PDR benchmarks and either qualify for an exemption from the EE/PDR cost recovery mechanism or potentially receive a payment as part of a reasonable arrangement with the electric utility. In order to update AEP Ohio's EE/PDR Benchmarks for 2009 from its Initial Benchmark Report, Table 1 provides the cumulatively adjusted baselines and benchmarks, for additional mercantile commitments to AEP Ohio's program.[1] AEP Ohio also reserves the right to implement any updates and adjustments through its annual Status Report based on additional mercantile commitments proposed in the future that affect the 2009 EE/PDR Benchmarks or the 2006-2008 baseline data.

With the inclusion of the current mercantile commitments, the benchmark requirements for CSP and OP are slightly higher than in the original filing on February 8, 2010. The mercantile commitments include those projects that the Companies and their customers have filed with the Commission.

All results reported for achievement of the benchmarks are gross *ex ante* energy and demand savings.

[1] Table 1 also includes 16 Self-Direct projects installed in 2006 that have been screened by AEP Ohio and the implementation contractor and recently filed with the Commission on March 11, 2009. Energy and demand savings associated with the projects are 1.99 GWh and 316 kW. The third party evaluation contractor will evaluate these projects during 2010, however, the appropriate benchmark adjustments are incorporated into this 2009 filing.

Table 1. Baseline Filed in 10-153-EL-EEC Adjusted for Customer-Sited Mercantile Resources.

	YEAR	SALES GWH		PEAK DEMAND MW	
		CSP	OPCO	CSP	OPCO
	2006	19,567	25,262	4,015	4,607
	+				
	Mercantile	6	48	1	8
		19,573	25,310	4,016	4,615
	2007	20,519	26,236	4,144	4,679
	+				
	Mercantile	14	54	3	9
		20,533	26,290	4,147	4,688
	2008	19,972	25,467	3,949	4,476
	+				
	Mercantile	43	68	6	11
		20,015	25,535	3,955	4,487
ADJUSTED THREE YEAR AVERAGE BASELINE		20,040	25,711	4,039	4,597
STATUTORY BENCHMARK	2009	0.3%	0.3%	1.0%	1.0%
BENCHMARK COMPLIANCE REDUCTIONS		60.12	77.13	40.39	45.97

BENCHMARK ACHIEVEMENT

Columbus Southern Power and Ohio Power have exceeded annual energy benchmarks for 2009. Table 2 summarizes the energy efficiency targets and achievements for each utility on an annualized basis.

Table 2. Energy Efficiency Benchmarks and Annualized Portfolio Achievement

	CSP GWH	OPCO GWH
BENCHMARK	60	77
EE ACHIEVEMENT	121	132

AEP Ohio requests that the Commission approve the annualized method of counting achievement toward compliance. The full justification for utilizing this methodology is reviewed in detail in Jon Williams' testimony on pages 13-15, filed in Case Nos. 09-1089-EL-POR and 09-1090-EL-POR in support of the Stipulation and Recommendation. The key reasons for the Commission to approve this methodology are summarized here:

1. Annualized reporting is the industry practice. At least 22 states use annualized reporting and AEP Ohio could not identify a state, program evaluator, implementation contractor or utility that supports the use of a part year reporting convention to count program impacts toward compliance.

2. Annualized reporting reduces administrative and monitoring and verification costs.

3. Annualized reporting results in more even and comparable impacts over a program and portfolio's first two years.

4. Annualized reporting for compliance does not change cost effectiveness test results since the results are based on the life of the measures. It does not change the net benefits and any shared savings calculations since the results are based on the life of the measures. In addition, part year calculations result in cost-effectiveness results which do not accurately reflect the program year costs and benefits.

5. Annualized reporting matches program cost expenditures with the impacts received over twelve months. Since this is a reporting methodology used throughout the country, the Commission, AEP Ohio and the other utilities in the state subject to a part year reporting convention will be less capable of comparing costs and benefits. The part year convention pays the full incentive when the customer installs the measure, but the part year reporting of impacts assigns some of the impacts to one year and some to the next year based on installation date.

6. Annualized reporting for compliance with the benchmarks is not linked to net distribution lost revenue reporting that requires actual reporting of impacts based on installation date.

AEP Ohio is reporting that both Companies have achieved compliance in 2009 under either reporting convention. The Companies are requesting that the Commission approve the annualized reporting convention because it is the industry standard and will be less costly to implement, manage and compare EE/PDR programs in the long term.

Consistent with paragraphs 5-8 of the Companies' July 9, 2009 application in Case Nos. 09-578-EL-EEC and 09-579-EL-EEC seeking confirmation of its interpretation, AEP Ohio's understanding of the PDR benchmarks is that compliance can be achieved through the PDR that occurs with the installation of an energy efficiency measure, through implementation of programs or PDR tariffs designed to achieve peak demand reductions, or by actual peak demand not exceeding the baseline minus the 1% benchmark. Table 3 shows that the actual peak demand in 2009 did not exceed the 2009 Baseline minus the 1% benchmark reduction requirement, therefore neither Company needed to invoke its PDR program to meet the 2009 benchmark.

Table 3. Peak MW Demand Reduction for 2009

	CSP MW	OPCO MW
2009 PEAK BASELINE	4,039	4,597
MINUS 1% BENCHMARK REDUCTION	40	46
ADJUSTED COMPLIANCE BASELINE	**3,999**	**4,551**
2009 ACTUAL PEAK	3,898	4,387
BASELINE MINUS ACTUAL	101	174
MET PDR BENCHMARK TARGET	YES	YES

Table 4 shows the PDR associated with the EE programs that AEP Ohio initiated for the Companies in 2009 and the contractual commitments from customers who receive service under the IRP-D tariff.

Table 4. EE Programs and IRP-D Tariff Peak Demand Reductions

	CSP MW	OPCO MW
BENCHMARK	40	46
EE PROGRAMS PDR CONTRIBUTION	15	19
TARIFF IRP-D	9	347
TOTAL	24	366

Table 5 summarizes the annualized energy benchmark achievements by customer class.

Table 5. Benchmark Annualized Achievement by Sector

	CSP GWHS	OPCO GWHS
BENCHMARK	60	77
RESIDENTIAL	50	40
COMMERCIAL	54	25
INDUSTRIAL	18	66
TOTAL ACHIEVED	121	131

AEP Ohio used the type of building and business activity that the business customer reported on their application to determine whether the project was commercial or industrial.

Given AEP Ohio's reasons supporting an annualized approach to counting achieved savings have not been confirmed by the Commission, Tables 6 and 7 present the results in Tables 2 and 4 using the part-year convention. For the part-year convention reporting, annualized energy (kWh) achievements were divided by 12 and then multiplied by the number of remaining months in 2009 based on the installation month. The balance of the annualized savings are carried forward for counting in 2010. For demand (KW) savings, if the project was completed prior to September 1, 2009, demand savings were counted in 2009, otherwise demand savings were zero in 2009 and will be captured in 2010. The 2010 achievements for both energy and demand that carry over to 2010 will not be evaluated in the 2010 Report since they have already been evaluated in this Report.

Table 6. Part-Year Convention of Energy Benchmark Achievements

	CSP GWH	OPCO GWH
BENCHMARK	60	77
EE ACHIEVEMENT	80	91

Table 7. Part-Year Convention of Peak Demand Reduction Benchmark Achievements

	CSP MW	OPCO MW
BENCHMARK	40	46
EE PROGRAMS DEMAND REDUCTION	13	17
TARIFF IRP-D	9	347
TOTAL	22	364

BANKING OF ACHIEVEMENTS

AEP Ohio, along with all of the Signatory Parties to the Stipulation in Case Nos. 09-1089-EL-POR and 09-1090-EL-POR, have requested specific over-compliance banking provisions as part of Article VIII of the Stipulation, in a manner consistent with the Rules. Approval of the Stipulation remains pending before the Commission. Accordingly, AEP Ohio reserves the right to bank all or part of CSP's and OP's 2009 over-compliance based on the outcome of the decision whether to adopt the Stipulation.

PROGRAM PERFORMANCE ASSESSMENT

AEP Ohio began introducing programs in the Spring of 2009, after a process that included the completion of a Market Potential Study, development of a Portfolio of Programs, receiving input from the Collaborative on the Program development, and selecting Implementation Contractors. This section of the report discusses the program activity through December 31, 2009, AEP Ohio operated six energy efficiency programs and one existing tariff based demand response programs. These programs include the:

Consumer Sector

- Products: Compact Fluorescent Lighting Program (CFL)
- Recycling: Residential Appliance Refrigerator and Freezer Recycling Program (Recycling)
- Energy Conservation Kits: Community Action Program Pilot (Kits)
- Energy Conservation Kits: Schools Pilot (Kits)

Business Sector

- Prescriptive: Lighting (Lighting)
- Custom: Non Prescriptive Measures (Custom)
- Self-Direct: Mercantile Customers' commitment of resources (Self-Direct)
- Interruptible Tariff Program (IRP-D)

In addition, after reviewing the results of the pilot program, the Companies then introduced a full-scale school education program called *e3Smart* in the fall of 2009. Impacts of the *e3Smart* program are not included in this report because teachers are not required to report the impacts to AEP Ohio until the end of the school year.

Tables 8 and 9 present summaries of the 2009 program costs and *ex ante* energy and peak demand savings attributable to the program offerings.

Table 8. Columbus Southern Power Direct Program Costs and Benefits

Program	Customer Incentives ($000)	Third Party Cost ($000)	Utility Admin ($000)	Total Program Cost ($000)	Number of Participants/ Units	Coincident Peak MW Saved	Annual GWh Saved
Products	1,012.4	976.7	182.8	2,171.9	1,003,672	2.9	43.5
Recycling	68.9	319.7	95.9	484.4	2,755	0.4	3.4
Kits*	198.6	11.3	2.5	212.4	8,996	0.5	2.6
Prescriptive	398.9	26.2	46.7	471.8	53	1.1	6.0
Custom	1.1	5.8	9.2	16.1	1	0.0	0.0
Self-Direct	3,384.1	47.4	382.8	3,814.3	162	9.3	62.9
Total*	5,064.0	1,387.1	719.9	6,958.5	1,006,643	13.7	115.8
Education/ Media	N/A	N/A	N/A	822.7			
Grand Total*	5,064.0	1,387.1	719.9	7,781.2			

*Totals exclude shareholder contribution from Partnership with Ohio funds of approximately $212,000 for the Kits program.

Table 9. Ohio Power Direct Program Costs and Benefits

Program	Customer Incentives ($000)	Third Party Cost ($000)	Utility Admin ($000)	Total Program Cost ($000)	Number of Participants /Units	Coincident Peak MW Saved	Annual GWh Saved
Products	830.2	769.5	179.5	1,779.3	771,293	2.2	33.3
Recycling	53.4	247.8	76.9	378.1	2,136	0.3	2.9
Kits*	268.0	10.7	2.4	281.1	12,140	0.7	3.5
Prescriptive	878.9	93.6	92	1,064.5	86	2.5	13.2
Custom	12.5	6.4	7.7	26.6	1	0	0.1
Self Direct	2,297.1	37.1	264.3	2,598.5	150	12.9	79.2
Total*	4,340.1	1,165.1	622.8	5,847.0	785,806	18.6	132.2
Education/ Media	N/A	N/A	N/A	778.6			
Grand Total*	4,340.1	1,165.1	622.8	6,625.5			

*Totals exclude shareholder contribution from Partnership with Ohio funds of approximately $280,000 for the Kits program.

PROGRAM COSTS

AEP Ohio obtained the program costs provided in this filing from the Companies' general accounting system that maintains records of invoices paid to implementation contractors, labor charges, labor overheads, material costs, rebates paid to customers, direct materials contractor payments, and direct payments to customers and outstanding contractor invoices. The Companies then manually reviewed these costs to determine the amounts recoverable under the EE/PDR Rider. AEP Ohio removed the labor and overheads related to "non incremental" employees from the analysis.

AEP Ohio obtained incremental participant costs directly from either the customer application records or industry averages.

PROGRAM SAVINGS ESTIMATES

For compliance purposes, AEP Ohio derived the estimates of program savings provided in this Portfolio Status Report by applying standard engineering calculations. Where the known baseline measure or equipment was available, AEP Ohio used it to calculate the gross *ex ante* savings estimate, otherwise, the Companies used the expected baseline. Details of the *ex ante* energy savings calculations are provided in each program description.

AEP Ohio's evaluation contractor, Navigant, provides the *ex post* energy savings calculations and program analysis In the Appendix. Details of their process and impact analysis are provided for each of the six programs.

PORTFOLIO COST-EFFECTIVENESS TESTS

The Commission is considering rules for calculating cost-effectiveness in Docket 09-512-GE-UNC. Each program submitted to the Commission in the Portfolio Plan was cost-effective. To estimate cost-effectiveness for compliance, AEP Ohio used an in-house model developed by its affiliate, American Electric Power Service Company. The Service Company based the model on the methodologies provided in the 2002 version of the California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Project and has used this model in energy efficiency and peak demand reduction compliance filings in other jurisdictions. California produced the first version of the manual in 1983. Since 1983, this manual has become the standard practice manual for cost-effectiveness across the country. The report includes the results of the Total Resource Cost test, the Participants' test, the Ratepayer Impact test, and the Utility Cost test.

For this Portfolio Status Report, AEP Ohio used the costs recoverable through the EE/PDR rider in the cost-effectiveness analysis in all programs except the Kits program.

PORTFOLIO COST-EFFECTIVENESS RESULTS

The Rules require each utility to assess the cost-effectiveness of the entire Portfolio. To calculate the costs and benefits of the portfolio, AEP Ohio summed the individual program costs and benefits over the weighted average savings life of the programs. We then estimated the cost-effectiveness model using the portfolio costs and benefits.

The results of the portfolio analysis are reported below in Tables 10-11. Tables 10 and 11 provide the cost-effectiveness using the standard method of counting energy and demand savings. The cost-effectiveness of each program is presented in the evaluation report of the program.

Table 10. CSP Portfolio Cost-Effectiveness Results

TEST	NET PRESENT VALUE	BENEFIT COST RATIO
TOTAL RESOURCE COST	$ 20,988,030	2.5
PARTICIPANT	$ 68,990,635	8.8
RATEPAYER IMPACT	$ (51,428,444)	0.4
UTILITY COST	$ 30,272,672	7.0

The CSP portfolio as a whole is cost-effective. Benefit/cost ratios for each program are presented in the evaluation reports prepared by Navigant and attached as Appendices B through G.

Table 11. OPCo Portfolio Cost-Effectiveness Results

TEST	NET PRESENT VALUE	BENEFIT COST RATIO
TOTAL RESOURCE COST	$ 24,006,599	2.1
PARTICIPANT	$ 80,358,275	5.9
RATEPAYER IMPACT	$ (59,237,778)	0.4
UTILITY COST	$ 41,043,812	10.5

The OPCo portfolio as a whole is cost-effective. Benefit/cost ratios for each program are presented in the evaluation reports prepared by Navigant and attached as Appendices B through G.

The next section provides brief descriptions of each program.

PROGRAM DESCRIPTIONS

Full program descriptions and an analysis of AEP Ohio's processes are presented in each evaluation report.

PRODUCTS PROGRAM (CFL)

AEP Ohio launched its CFL Program in April 2009 in thirteen Home Depot locations, one Costco location and ten Sam's Club locations. These locations provided CFLs for a marked down price from three manufacturers. In addition, an On-Line Store was available through a link on the gridSMARTohio.com website. By December 2009, 649 retail locations were offering the program with CFLs from ten manufacturers. These locations range from small neighbor hardware stores to large big box stores throughout the AEP Ohio service territory. Seventy-six of these retailers enrolled in the Instant Coupon Program.

After a competitive bidding process, AEP Ohio contracted with Applied Proactive Technologies, Inc., (APT) of Springfield, MA. The program concept includes agreements with both manufacturers and retailers. The retailers order product, the manufacturer ships the product with a reduced price. The retailer then sells the product and reports the sales to the manufacturer. The manufacturer, in turn, submits an invoice to APT. APT pays the manufacturer and AEP Ohio pays APT.

The primary delivery method is through a mark-down. A mark-down is structured as a direct pass through discount from the wholesaler to the retailer who then passes on the per unit incentive for all sales of a particular product during a specified promotional period. The markdowns, or incentives are paid APT upon verification of point-of-sale data. AEP Ohio receives verified invoices from the third-party contractor and pays the incentive. After a few months, AEP Ohio added a paper coupon option for locations that were unwilling or unable to accommodate electronic markdowns.

Included in the total are 50,000 CFLs purchased by AEP Ohio and distributed through local non-profit organizations for use in community projects for low-income customers.

PRODUCTS PROGRAM ENERGY AND DEMAND SAVINGS ESTIMATES

The 2009-2011 EE/PDR Action Plan (Action Plan) goal for AEP Ohio was 40.8 GWhs or an equivalent 996 thousand 13-watt lamps. Retailers reported sales of almost 1.8 million lamps in 2009.

To estimate energy and demand savings, AEP Ohio used the expected baseline lamp wattages and recommended replacements provided in Volume 3, page D-46 of the Action Plan. The Action Plan used operating hours of 832 per year. AEP Ohio used the same number of operating hours in the energy savings estimates.

Table 12 presents the Products Program – CFL energy, demand savings, program costs and cost of first energy year savings for CSP and OPCo.

Table 12. CFL Program Summary

MEASURE	CSP	OPCO	TOTAL	PLAN GOAL
GWH	43.52	33.35	76.87	40.80
MW	2.93	2.24	5.16	4.70
PROGRAM COSTS	$2,171,928	$1,779,241	$3,951,169	$3,441,732
COST FOR FIRST YEAR KWH SAVED	$0.050	$0.053	$0.051	$0.084

Both CSP and OPCo exceeded the plan goals. AEP Ohio anticipates that the program will meet or exceed its goals in 2010 and 2011.

RECYCLING PROGRAM - APPLIANCES

AEP Ohio launched its Appliance Recycling Program in May 2009. The first refrigerator collected was a 1975 Gibson that had an estimated annual usage of 1,752 kWh.

After a competitive bidding process, AEP Ohio contracted with JACO Environmental, Inc., (JACO) of Snohomish, WA. The program concept provides customers with rebates of $25 for each working second refrigerator or freezer that is committed to the program for recycling. Customers may enroll in the program by telephone or on-line. The gridSMARTOhio website provides the telephone number as well as a link to the JACO website for on-line enrollment. A JACO customer service representative then contacts the customer and confirms the date of appliance pick-up. Local JACO staff then picks up the appliance on the scheduled date and returns it to the Columbus recycling center. JACO opened the Columbus recycling operation in 2009. The operation processes appliances for recycling for both the AEP Ohio program and the program that Dayton Power and Light operates. JACO recycles the components of the appliance and arranges for proper disposal or salvage. JACO then sends the customer the incentive check.

RECYCLING PROGRAM ENERGY AND DEMAND SAVINGS ESTIMATES

The Action Plan goal for AEP Ohio was 4.7 GWhs or an equivalent 4,024 refrigerators. JACO picked up 4,891 appliances.

To estimate energy and demand savings, AEP Ohio used the reported expected usage numbers from the Department of Energy website when available. When baseline usage information was not available, AEP applied the mean usage from the group of appliances within the set of years between code changes.

Table 13 presents the Recycling Program energy, demand savings, program costs and cost of first year energy savings for CSP and OPCo.

Table 13. Recycling Program Summary

	CSP	OPCO	TOTAL	PLAN GOAL
GWH	3.44	2.87	6.31	4.70
MW	0.39	0.30	0.69	0.56
PROGRAM COSTS	$484,448	$378,132	$862,580	$1,193,527
COST FOR FIRST YEAR KWH SAVED	$0.14	$0.13	$0.14	$0.25

Both CSP and OPCo exceeded the plan goals. AEP Ohio anticipates that the program will continue to meet or exceed its goals.

ENERGY CONSERVATION KITS - LOW INCOME PROGRAM

AEP Ohio operated one pilot program for a school education program and one pilot program targeted to low income customers in 2009. Both pilot programs were paid for using Partnership with Ohio funds. This funding is from AEP shareholders and not recoverable through the EE/PDR rider. The costs are shown only for evaluation of cost-effectiveness. Each of these programs distributed energy conservation kits to either school students or clients of Community Action Programs. These programs are:

- Schools Pilot Program
- Community Action Program

SCHOOLS PILOT PROGRAM

The Companies initiated a pilot school education program with Ohio Energy Project. AEP Ohio distributed approximately 1,642 kits to Ohio Energy Project which, in turn, trained teachers in an energy efficiency curriculum and provided the kits to the students for installation in their residences with their parents' assistance. The teachers distributed 1,642 kits to their students.

Each kit contained 2 13-watt spiral CFLs, 2 23-Watt spiral CFLs, and one each of a LED nightlight, package of outlet/ switch gaskets, closed cell foam weather-stripping, self-adhesive door sweep, hot water temperature gauge card, showerhead, roll of Teflon tape, flow meter bag, furnace filter alert whistle, refrigerator temperature gauge card, energy use gauge calculator, and energy conservation wheel. The estimated savings for the measures were 546 kWh if all the measures were installed.

The teachers reported the number of measures actually installed in the student's residence. The estimated *ex ante* savings of the installed measures were 282 kWh for each kit.

COMMUNITY ACTION PROGRAM

AEP Ohio, in partnership with the Ohio Department of Development, distributed approximately 20,000 energy conservation kits to customers through Community Action Programs Agencies (CAPs) with instructions to provide them to AEP Ohio customers who received HEAP bill payment assistance. The CAPs reported distributing 19,494 kits to assistance applicants from November 2008 through June 2009. However, 29 CAPS submitted 431 names and addresses without an account number. In addition, 57 of the account numbers submitted were not AEP Ohio account numbers. In addition, when AEP Ohio matched these account numbers with our customer information system, an additional 4,481 accounts did not appear as valid account numbers.

Only CAPs within AEP Ohio's service territory received the kits. Anecdotal evidence exists that some CAPs distributed the kits to all applicants regardless of whether the clients were AEP Ohio customers. Move-ins and move-outs could account for some of the non-matched data as well as data entry errors. AEP Ohio believes that customers receiving the kits do consume electricity in the state of Ohio and therefore will count the energy and demand savings generated from the measures.

AEP Service Corporation contracted with Thoroughbred Research, Inc. to perform a phone survey of customers receiving the kits to determine what measures the participant actually installed. The energy savings from the research indicated the estimated *ex ante* energy savings from the measures installed were 283 kWh.

Table 14 presents the Kits Programs energy, demand savings, program costs and cost of first year energy savings for CSP and OPCo.

Table 14. Kits Program Summary

	CSP	OPCO	TOTAL	PLAN GOAL
GWH	2.55	3.45	6.00	N/A
MW	0.51	0.71	1.23	N/A
PROGRAM COSTS	$212,393	$281,131	$493,524	N/A
COST FOR FIRST YEAR KWH	$0.083	$0.082	$0.082	N/A

PRESCRIPTIVE PROGRAM - LIGHTING

AEP Ohio officially introduced the Lighting Program with a series of seven meetings conducted for business customers throughout the service territories in May 2009. By the end of 2009, AEP Ohio had conducted 21 seminars and meetings across the service territories.

The program offers fixed incentives for the installation of certain pre-determined types of lighting equipment. The program is available for use in both retrofit and new construction applications.

AEP Ohio used a competitive bidding process to select a contractor to implement the Prescriptive Lighting Program. AEP Ohio selected KEMA Services Inc. as implementation contractor.

PRESCRIPTIVE PROGRAM ENERGY AND DEMAND SAVINGS ESTIMATES

The Action Plan goal for AEP Ohio was 69.6 GWhs or an equivalent replacement of 1,100,645 T-12 4-foot lamps with the same number of T-8 4-foot lamps.

KEMA and AEP Ohio developed tables of standard baseline equipment and operating hours for each measure. Incentives ranged from a low of $2.00 for a CFL to a high of $350.00 for a new T-8 or T-5 fixture.

Table 15 presents the Prescriptive Program energy, demand savings, program costs and cost of first year energy savings for CSP and OPCo.

Table 15. Prescriptive Program Summary

	CSP	OPCO	TOTAL	PLAN GOAL
GWH	5.95	13.17	19.13	68.24
MW	1.11	2.48	3.59	21.41
PROGRAM COSTS	$471,823	$1,064,544	$1,536,366	$8,861,266
COST FOR FIRST YEAR KWH SAVED	$0.079	$0.081	$0.080	$0.130

Neither CSP nor OPCo met their plan goals for lighting through the Prescriptive Lighting Program. The partial year program offering contributed significant to the underachievement of the goal. With a full year program in 2010 and 2011, and the expansion of prescriptive offerings, AEP Ohio expects that program participation and impacts will increase.

CUSTOM PROGRAM

The Custom Program targets non-residential customers who have energy efficiency projects that are not included in the Prescriptive Lighting Program or who have other projects such as motor replacements, variable frequency drives, HVAC, process improvements or other measures. AEP Ohio administered this program.

AEP Ohio paid incentives on two projects during 2009, one in each service territory. Custom projects normally take more time to develop and AEP Ohio has a strong pipeline of application for 2010.

CUSTOM PROGRAM ENERGY AND DEMAND SAVINGS ESTIMATES

To estimate energy and demand savings, AEP Ohio required customers to present an analysis of energy and demand savings for the projects. The calculations were then verified by KEMA Services, Inc.

Table 16 presents the Custom Program energy, demand savings, program costs and cost of first year energy savings for CSP and OPCo.

Table 16. Custom Program Summary

MEASURE	CSP	OPCO	TOTAL	PLAN GOAL
GWH	0.01	0.13	0.14	37.57
MW	0.00	0.03	0.03	2.92
PROGRAM COSTS	$16,091	$26,576	$42,667	$6,958,741
COST FOR FIRST YEAR KWH SAVED	$1.11	$0.21	$0.30	$0.19

The Custom Program did not achieve its energy efficiency or demand savings goals in either CSP or OPCo. While the Custom program has been slower to develop than the Prescriptive or Self-Direct program, the Custom projects in the pipeline plus the changes in marketing and development strategy planned for 2010 should allow the program to achieve overall savings targets by the end of 2011.

SELF-DIRECT PROGRAM

The Self-Direct program allows mercantile customers to jointly commit their retrospective energy efficiency and demand reduction resources to AEP Ohio in a defined process as described in the Portfolio Plan.

AEP Ohio launched the Self-Direct Program on June 1, 2009. This program targets non-residential customers who have installed energy efficiency measures and who meet the qualifications of a mercantile customer. Applicants provide the same information and follow the same requirements for EM&V as those of a participant in the Prescriptive Lighting or Custom Programs.

AEP Ohio has filed 330 applications with the Commission for Self-Direct projects. The Commission has approved two projects to date and the others are awaiting consideration. For compliance purposes, AEP Ohio has made the assumption that the docketed projects will be approved by the Commission and count toward CSP and OPCo's benchmark requirements.

The potential for the Commission to rule that a part- year reporting convention is required for compliance, places significant importance on the Self-Direct program because an approved project can count as a full twelve month toward 2009 compliance if completed in 2006 through 2008.

SELF DIRECT PROGRAM ENERGY AND DEMAND SAVINGS ESTIMATES

The Action Plan did not provide a goal for the Self-Direct program because there is not an industry model for the program. In addition, the Commission approval process for was not defined at the time. Instead, AEP Ohio plans to use the Self-Direct program to achieve any unattained portions of the Prescriptive and Custom program goals and assign them to the Mercantile Program.

To estimate energy and demand savings, AEP Ohio used the same procedures used in the Prescriptive and Custom programs.

Table 17 presents the Self Direct Program energy, demand savings, program costs and cost of first year energy savings for CSP and OPCo.

Table 17. Self Direct Program Findings

MEASURE	CSP	OPCO	TOTAL	PLAN GOAL
GWH	62.92	79.19	142.10	N/A
MW	9.28	12.94	22.23	N/A
PROGRAM COSTS	$3,814,244	$2,598,545	$6,412,789	$5,000,000
COST FOR FIRST YEAR KWH SAVED	$0.06	$0.03	$0.05	N/A

While the Self-Direct program did not have specific impacts assigned, AEP Ohio will exceed the Plan budget of $5 million if the Commission approves all the projects filed and all customers select the Option 1 incentive, rather than an exemption. However, the total Business budget has not been exceeded. AEP Ohio expects program growth to continue through 2010.

GENERAL ENERGY EDUCATION

The program coordinated EE/PDR educational activities with Marketing and Corporate Communications advertising, media and other support to promote awareness for the consumer and business programs:

- Building and maintaining a website
- Creating both print and digital media and informational materials
- Organizing displays
- Presenting at community events

AEP Ohio created a presentation on energy efficiency for use with general audiences. Additionally, EE/PDR staff developed and delivered presentations featuring the energy efficiency and demand response programs to community audiences.

AEP Ohio developed an advertising campaign to educate customers on general energy efficiency, providing tips and reminders to visit AEP Ohio's website for assistance and to participate in programs.

AEP Ohio participated in multiple events including the Ohio State Fair to promote programs, provide energy efficiency tips and build customer awareness of energy efficiency.

EDUCATION AND TRAINING

AEP Ohio offered education programs for commercial and industrial customers in 2009 to provide assistance for customers seeking higher efficiency equipment and to broaden the company's reach to its customers. The AEP Ohio EE/PDR department and outside experts provided assistance to about 1,200 AEP Ohio customers at about 20 events.

Corporate communications and marketing assisted in creating on-line access to program applications, calculation spreadsheets and contact information and supporting educational materials.

Corporate communications and marketing also managed creation of a website to support the AEP Ohio EE/PDR programs at gridsmartohio.com

Marketing designed and printed materials for customer service and EE/PDR team members to distribute to customers about the programs.

- Custom Program Fact Sheet
- Prescriptive Program Fact Sheet
- Self Direct Program Fact Sheet
- Business Programs Handout

The Marketing department also created a display for table-top use at business customer or trade ally events.

AEP Ohio EE/PDR also provided training to customer account managers and shared information with other AEP Ohio employees to help them understand program rules and to assist customers seeking to participate in programs.

AEP Ohio spent $1.6 million for education/ training and media purchases in 2009. Media and education costs were difficult to separate between the Companies and market sectors so AEP Ohio allocated $822,000 to CSP and $773,000 to OPCo, based on the customer base.

PORTFOLIO PLAN RECOMMENDATIONS

This section of the report contains recommendations for whether each program should be continued, modified or eliminated. For 2010, AEP Ohio does not plan to recommend alternative programs to those described in the Program Portfolio Plan.

CONSUMER SECTOR PROGRAMS

PRODUCTS PROGRAM

The primary focus of this program is to provide CFL instant incentive markdowns through retailers throughout the service area. The results indicate that this program has delivered kWh savings greater than plan and at lower cost with no adverse customer satisfaction or program delivery issues. In 2009, the only product offered was CFLs and limited LED lighting products. In 2010, the focus should remain on efficient lighting products, primarily CFLs. The program design in the Plan called for an expansion into appliances; however, the success of the CFL program in 2009 indicates significant demand for those products and the Products Program's cost effectiveness should not be diluted with less cost effective appliance offerings. To provide customers efficient appliances in a less costly way, AEP Ohio has teamed up with the Ohio Department of Development to promote stimulus funding rebates of energy efficient appliances through bill stuffers and to offer appliance recycling through our existing program. Also, AEP Ohio is considering offering heat pump water heating rebates as part of the Products Program or through the Pilot Program to promote market transformation.

RECYCLING PROGRAM

The refrigerator/freezer recycling program should continue as designed. The results were similar to Plan, while only running for a portion of the year. Incentives may be adjusted depending on customer participation.

RETROFIT PROGRAM

The home energy retrofit program did not begin in 2009 in order to delay spending until cost recovery was approved. The Products program provided opportunities for all residential customers to participate and performed better than expected, allowing AEP Ohio to delay launch of this program. A modification to the program is recommended to shift the 2009 budget into 2010-2011 period to provide full funding for this program.

LOW INCOME PROGRAM

The Low Income Weatherization program did not begin in 2009 in order to delay spending until cost recovery was approved. Further, negotiations with the delivery provider were not finalized until the Stipulation Agreement was filed on November 13, 2009. A modification to the program is recommended to shift the 2009 budget into 2010-2011 period to provide full funding for this program. AEP Ohio focused on the low income customers through Partnership with Ohio funds and provided energy weatherization kits to nearly 20,000 low income customers who came in to the Community Action agencies for bill pay assistance.

NEW CONSTRUCTION PROGRAM

This program has not started according to Plan. The program will begin in 2010.

BEHAVIOR MODIFICATION PROGRAM

The Plan provides $3,000,000 to implement a behavior modification program. This program has been reviewed with the Collaborative and it has the support to implement a 2010-2011 program. This program is recommended to be rolled out in mid-2010 to 150,000 AEP Ohio residential customers at no cost to them; 125,000 high use customers and 25,000 low income customers. Savings from the high use customers are projected to be 35,000 MWh in the first year and 51,000 MWh in the second year. The projected TRC and UCT is 1.7. This behavioral program engages residential customers by providing information that helps them compare their energy use at home to that of their virtual "neighbors" and to their own historic usage. The information is sent by the implementer, OPower, in mailed home energy reports which will also be available to participating customers and customer service agents on-line. The comparisons with similar households help customers understand that they may have opportunities to improve their energy efficiency. The home energy reports will also contain efficiency tips, and education about AEP Ohio's other efficiency programs targeted to their particular characteristics, i.e., energy usage suggesting heavy air conditioning, home owner/renter, etc. Energy savings for participating customers are measured through statistical analysis comparing the participating customers' usage with that of similarly situated customers who are not receiving the home energy reports.

ENERGY CONSERVATION KITS

A pilot conducted to introduce the *e3Smart* school education program in early 2009 concluded that an educational based program for middle to high school children not only provides market transformational opportunities but also cost effective energy savings. The full scale program using AEP Ohio's implementation contractor, Ohio Energy Project, began in the fall of 2009 and is recommended to continue through 2011. It is also recommended that program dollars not spent in 2009 be shifted for use in 2010-2011 for this program.

Background on the fall launch of the *e3Smart* school education program:

e3Smart Program

Based on the results of the Schools Pilot Program, AEP Ohio launched the *e3Smart* energy efficiency education program in the fall of 2009 again contracting with the Ohio Energy Project to provide curriculum and a teacher manual, to train teachers, to collect data, and to provide program support. Teachers from 141 schools received training in one of eleven workshops or at their schools. The program extended energy efficiency learning from the classroom to the homes of participating students whose parents or adult caregivers had returned a signed agreement for home participation. Seven modules covered general energy concepts and addressed specific areas of home energy use: lighting, refrigeration, heating, cooling, plug load and the ways that insulation, infiltration and behavior can affect energy use.

An RFP was released in August, 2009 seeking competitive bids for energy conservation kits, for watt meters, and for LED decorative light strands. 180 watt meters were purchased for the teachers' kits; 13,500 energy conservation kits were purchased for students to take home to participating households. Each kit contained fourteen components to be installed or otherwise used to engage other family members in energy efficient behaviors and to reduce energy use. Kit components are 2

23-watt CFLs, 2 15-watt CFLs, 1 low-flow showerhead, 1 door sweep, 4 outlet cover gaskets, 4 switchplate gaskets, 1 roll of weatherstripping material sufficient for one outside door, an LED nightlight, a furnace filter whistle, an LCD temperature display, a refrigerator thermometer, and an energy information wheel. Each student also received a copy of the U.S. Department of Energy booklet, Energy Savers, purchased by the Ohio Department of Development's Office of Community Services, Weatherization Program. The lessons include a pre and post home energy audit conducted by the student.

Teachers are expected to complete all lessons by April 30, 2010. The Ohio Energy Project will analyze data on learning, satisfaction and participation and prepare a final report by June, 2010.

In 2009, CSP incurred program costs of $87,691 and OPC incurred program costs of $111,420. Energy and demand savings from this program will be captured in the 2010 analysis.

For 2010/2011 teachers who have completed all reporting requirements will be invited to participate again. Recruitment for new teachers will attempt to encourage school districts in Ohio Power or Columbus Southern Power not yet represented to participate in the upcoming school year.

BUSINESS SECTOR PROGRAMS

PRESCRIPTIVE PROGRAM

The Prescriptive program began June 1, 2009, focused in the first year on prescriptive lighting only. While the performance of the program was less than Plan, the result was clearly due to the lack of a full year's program availability. Applications and program activity indicate a significant pent up demand from AEP Ohio customers to do cost effective energy efficiency projects. In addition and according to the Plan, AEP Ohio is expanding the list of prescriptive measures in 2010 under this program beyond lighting, to include HVAC, motors, drives and other cost effective measures to simplify and market this program effectively. AEP Ohio recommends that program dollars not spent in 2009 shift for use in 2010 for this program.

CUSTOM PROGRAM

The Custom program began June 1, 2009 and while few projects were completed in 2009, a significant number of applications are pending and interest in the program is ramping up significantly. For future funding, some custom projects will shift to prescriptive once the measures in the prescriptive offering are expanded in 2010. The Custom program is designed to handle customer efficiency needs not addressed through other business programs. Two specific needs were identified in 2009. One is a direct install program for small business. Very few applications to date were received in this important demographic segment and AEP Ohio believes a focused effort is necessary to assist small business customers. This issue has been discussed in the Collaborative as well and has support. AEP Ohio intends to work with the Collaborative and other key small business advocacy groups such as the Ohio Chamber of Commerce to focus on small business efficiency in addition to the other aspects of the Custom program. The second need is a focused program to address agriculture. Work with the Collaborative and Ohio Farm Bureau is expected to produce a concentrated Custom program effort for this segment. While these targeted segment approaches to the Custom Program are not expected to significantly change the cost effectiveness of the Custom program overall, each will be monitored and listed as a subset of the Custom Program to track performance and participation. AEP Ohio recommends that program dollars not spent in 2009 shift for use in 2010 for this program.

LED TRAFFIC SIGNALS

This program has been evaluated as part of the Prescriptive program. AEP recommends no modifications to this program.

DEMAND RESPONSE

According to Plan, a tariff program was not launched in 2009, because the peak demand in 2009 for both OPCO and CSP are greater than the 1% benchmark requirement below their respective three-year adjusted baseline level. It is further AEP Ohio's understanding that either this calculation or achievement of the actual benchmark requirement qualifies for compliance purposes. Subject to Commission approval, AEP Ohio plans to implement a modified tariff offering that is similar to PJM demand response programs for 2010 compliance.

SELF DIRECT PROGRAM

The Self Direct program funding in the Plan for 2009 is $5 million. While AEP Ohio did not project impacts in the Plan due to the uncertainty in customer participation, rules and Commission approval of mercantile customer projects, this program has achieved significant impacts and participation with 330 applications filed with the Commission for 2009. The program has two customer options, either payment of an energy efficiency credit or an exemption from the EE/PDR rider. Only two applications have been approved to date, and until the Commission approves the remaining applications, it is unknown how much of the Self Direct program budget will be utilized. AEP Ohio recommends that program dollars not spent in 2009 awaiting Commission approval shift for use in 2010-2011 for this program.

A

AFFIDAVIT OF JON F. WILLIAMS

State of Ohio :
: ss
County of Franklin :

Jon F. Williams, being first duly sworn according to law, deposes and says:

1. I am the Manager of Energy Efficiency and Peak Demand Reduction for AEP Ohio, which includes Columbus Southern Power Company (CSP) and Ohio Power Company (OP), collectively, AEP Ohio.

2. I have job responsibilities that include the design, development and implementation of customer programs relating to Energy Efficiency (EE) and Peak Demand Reduction (PDR) for AEP Ohio, including overseeing compliance with the EE/PDR mandates of Senate Bill 221 (SB 221) and the rules adopted by the Public Utilities Commission of Ohio (Commission) for inclusion in Ohio Administrative Code Chapter 4901:1-39 (Green Rules).

3. Based on my understanding of SB 221 and the Commission's Green Rules, CSP's energy baseline to be used for the 2009 reporting year is 20,040 gWh and OP's is 25,711 gWh.

4. Based on my understanding of SB 221 and the Commission's Green Rules, CSP's EE benchmark for the 2009 reporting year is 60.12 gWh and OP's is 77.13 gWh.

5. Based on my understanding of SB 221 and the Commission's Green Rules, CSP and OP complied with the EE benchmark for the 2009 reporting year.

6. Based on my understanding of SB 221 and the Commission's Green Rules, CSP's demand baseline to be used for the 2009 reporting year is 4,039 MW and OP's is 4,597 MW.

7. Based on my understanding of SB 221 and the Commission's Green Rules, CSP's 1% PDR benchmark for the 2009 reporting year is 40.39 MW and OP's is 45.97 MW. On that basis, CSP could achieve compliance for 2009 by either implementing programs (including programs offered through a tariff) designed to achieve a peak demand reduction of 40.39 MW in 2009 or if peak demand is less than 3,999 MW (*i.e.*, 4,039 MW less 40.39 MW); OP could achieve compliance for 2009 by either implementing programs (including programs offered through a tariff) designed to achieve a peak demand reduction of 45.97 MW in 2009 or if peak demand is less than 4,551 MW (*i.e.*, 4,597 MW less 45.97 MW).

8. Based on my understanding of SB 221 and the Commission's Green Rules, CSP and OP complied with the PDR benchmark for the 2009 reporting year.

FURTHER AFFIANT SAYETH NAUGHT.

Jon F. Williams

Sworn to before me and subscribed in my presence this 11 day of March, 2010.

Notary Public

MICHELLE L. KISHA, Notary Public
In and for the State of Ohio
My Commission Expires Jan. 21, 2013

B

NAVIGANT
CONSULTING

AEP Ohio
Energy Efficiency/
Demand Response Plan
Plan Year 1 (1/1/2009-12/31/2009)
Program Year 2009 Evaluation Report:
Efficient Products Program

Presented to

AEP Ohio

March 9, 2010

Presented by

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Table of Contents

Section 1. Executive Summary

This report presents the first-year evaluation results of AEP Ohio's Efficient Products program. The goals of the Efficient Products program are to produce long-term electric energy savings in the consumer sector by increasing the market share of high-efficiency lighting products and appliances sold through retail sales channels and to promote the purchase and installation of energy efficient HVAC and hot water heating equipment[1,2]. The first year goal of the Efficient Products program was to produce 40.8 GWh of electrical energy savings and 4.7 MW of peak demand reduction through discounted CFL sales to residential customers within the AEP Ohio service territories.

The first year of the program focused on the implementation of the lighting products element, also known as the SMART Lighting[SM] program. During 2009, the main goal of this program was to increase the market penetration of energy efficient lighting within AEP Ohio service territory by offering incentives for compact fluorescent lamps (CFLs) purchased through various retail channels. The program also sought to increase customer awareness and acceptance of energy-efficient lighting technologies, as well as proper CFL disposal, through the distribution of educational materials and via the gridSMART Ohio Web site.[3]

Evaluation Objectives

The primary objectives of this evaluation are to quantify the impacts resulting from the Efficient Products program and to assess program participants' perceptions and satisfaction with the program processes.[4] Limited process evaluation research was conducted to document key program delivery processes and to provide AEP Ohio with early feedback on program operational efficiency. The findings and recommendations in this report are related to the lighting component only, though references to the other program components will be made throughout.

Evaluation Methods

The impact evaluation for the Efficient Products program utilized the program tracking data for the Efficient Products CFL Discount component (for both the coupon and upstream markdown market mechanisms) to apply the algorithms for estimating both energy savings (MWh) and peak demand reduction (MW). The parameters for these calculations were determined from the assumptions in the 2009 to 2011 Energy Efficiency / Peak Demand Reduction (EE / PDR) Action

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[1] Volume 1: 2009 to 2011 Energy Efficiency/Peak Demand Reduction (EE/PDR) Action Plan; November 5, 2009, page 47.

[2] Hereafter the program will be referred to as the Efficient Products program.

[3] www.gridsmartohio.com

[4] This evaluation study is not comprehensive or exhaustive research; rather the study was designed to provide early feedback on program performance for 2009.

Plan (herein referred to as the "Program Plan"), and from the 2004-2005 Database for Energy Efficiency Resources (DEER) Update Study[5]. Energy savings estimates were developed for both full-year and part-year (where savings can only be counted for months in PY 2009 where the measure was actually installed.)

The process evaluation component of the Efficient Products CFL Discount Evaluation focused on perceptions of the program operations and delivery including the market outlook, retailer participation, as well as, satisfaction with the program, current challenges, and other potential issues. The process research was based upon in-depth interviews with a variety of individuals involved in the delivery of this program. Table 1-1 provides a summary of the data collection activities conducted to support the process evaluation. As shown, the primary data collection activities for this evaluation included a series of in-depth telephone interviews with program administrators from AEP Ohio, employees at participating retailers, and implementation contractor staff.

Table 1-1. Data Collection Activities

Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
Tracking Data	All Retail Coupon Participants	Coupon Tracking Database	-	All	Ongoing
	All Retail Markdown Participants	Markdown Tracking Database	-	All	Ongoing
In-depth Phone Interviews	Participating Retailers – Instant Coupons	Coupon Tracking Database	5 store-level managers from participating instant-coupon retailers	4	Feb 2010
	Participating Retailers – Markdown	Tracking Database	5 store-level managers from participating markdown retailers	8	Feb 2010
	Efficient Products Program AEP Ohio Staff	Contacts from AEP Ohio	Consumer Programs Coordinator, AEP Mgr of Consumer Programs, AEP	2	Feb 2010
	Efficient Products Program Implementers	Contacts from APT and EFI	Regional Director of Operations, APT Program Mgr, Utility Division, EFI	2	Feb 2010

Note: Purchases of CFLs made though the Online SMART Lighting Store are included in the Markdown Tracking Database.

[5] Itron Inc., 2004-2005 Database for Energy Efficiency Resources (DEER) Update Study. Final Report. Prepared for Southern California Edison, December 2005, Table 2-1, page 2-4.

Key Impact Evaluation Findings

The first year goal of the Efficient Products program was to produce 40.8 GWh of electrical energy savings and 4.7 MW of peak demand reduction through discounted CFL sales to residential customers within the AEP Ohio service territories. A total of nearly 1.8 million CFLs were sold through the program in 2009. The evaluation team estimated two metrics for program impacts: one that credits lamps sold in 2009 with a full year of savings and one that gives lamps part-year savings based on the month the lamp was installed.

The program produced full-year savings of 74,076 MWh, part-year savings of 22,297 MWh, and peak demand reduction of 4.98 MW. The ex-ante full-year savings for PY 2009 was 76,865 MWh and 5.17 MW, which results in a realization rate of 96% for both energy and peak demand savings. The difference between ex-ante and ex-post savings estimates is driven by a difference in the baseline wattage of incandescent lamps which are replaced by the CFLs. Table 1-2 below provides the verified key parameter estimates as well as the first-year energy savings and peak demand reduction estimates.

Table 1-2. PY 2009 Impact Evaluation Inputs and Estimates

	Full-Year Impacts	Part-Year Impacts
Program CFL Sales	1,774,967	1,774,967
Average Displaced Watts (Delta Watts)	50.16	50.16
Average Daily Hours of Use	2.28	2.28
Average kWh Annual Impact per unit	41.73	12.56
kW Impact per unit	0.00284	N/A
Installation Rate	100%	100%
Peak Load Coincidence Factor	0.056	N/A
Total First-Year MWh Savings	**74,076**	**22,297**
Total First-Year Peak MW Reduction	**4.98**	**N/A**

Key Process Evaluation Findings

The process portion of this evaluation reveals several notable findings. Overall, AEP staff, implementation contractors, and participating retailers and manufacturers are satisfied with the program to date. In particular, retailer staff is particularly satisfied with the field representatives and indicates that field reps are doing a good job at building relationships with retailers at this level.

Current challenges include the following:

» AEP's Efficient Products program is a first-year program for which CFL saturation is assumed to be low and the installation rate is assumed to be high. For this reason, and because this evaluation did not collect primary data to estimate an installation rate in the AEP service territory, an installation rate of 100% was assumed for PY 2009 savings estimates. It is recommended that future evaluations for future years collect primary data to estimate installation rates in the AEP service territory.

In addition, there are a number of external factors that could affect the Efficient Products program in the short term. These include:

» Pending federal legislation (EASA) requiring increased efficiency from incandescent lighting options will increase the baseline efficiency of the typical screw-in lamp. With a higher baseline efficiency, the per-unit energy and demand reduction will be reduced, which will decrease realized savings from CFLs.

» Increasing customer concerns over proper CFL disposal.

Section 2. Introduction to the Program

This section provides an overview of the AEP Ohio Efficient Products program. The section begins with a brief description, followed by a summary of various aspects of the implementation strategy and marketing.

Program Description

The Efficient Products program provides incentives to increase the market share of ENERGY STAR® qualified CFLs sold through retail sales channels. The program also seeks to distribute educational materials to raise customer awareness and acceptance of CFLs and to promote proper lamp disposal. For the year 2009, the Efficient Products program accounts for 24% of AEP Ohio's total electric program portfolio plan goal and 65% of its Consumer (residential) sector portfolio plan goal.

The majority of the Efficient Products program is delivered upstream (at the retailer level), which minimizes the burden on consumers, thus lowering barriers to participation, but making program participant identification (and thus evaluation) difficult. A small portion of the CFL rebates were delivered via in-store coupons[6] that allowed for the capture of participant name and contact information.

2.1.1 Implementation Strategy

Role of AEP Ohio Staff

A new department was formed at AEP Ohio as a direct result of the state law, SB 221, which requires investor-owned electric utilities in Ohio to create programs to help customers conserve and reduce demand for electricity. The two staff members most involved in the administration of Efficient Products program are the Manager of Consumer Programs and the Consumer Programs Coordinator. However, the program is by-and-large run and managed by the staff of Applied Proactive Technologies (APT), an implementation contractor.

The AEP Ohio Consumer Programs Manager is responsible for implementation and management related to residential customers, including the Efficient Products program, the Appliance Recycling, and other programs such as the Partnership with Ohio ratepayer funds. The AEP Ohio Consumer Programs Manager is currently working on developing program operations manuals for the residential programs.

The AEP Ohio Efficient Products Program Coordinator is responsible for day-to-day program management responsibilities for the utility, including weekly communication with the program

[6] Coupon sales account for less than 1% of program sales (traditional spiral lamps only) and were the sole means of program participation at two of the eleven program retailers.

qualified products, and at the right incentive level when retailers submit sales data and invoices for payment.

AEP Ohio and APT agree they have a solid working relationship and are in constant communication about the program. In fact, in 2009, (and through February 2010, when staff interviews for this evaluation were conducted) the AEP Ohio Program Coordinator held weekly calls with the Regional Director of Operations from APT.[7] The same is true for perspectives on the relationship and communications between APT and EFI.

Role of the Manufacturer

According to APT, the manufacturers of CFLs have many responsibilities in this program. First, the manufacturer is typically selling their products to the retailer at a wholesale price. As such, they are often the party reimbursed by the utility. If AEP Ohio were to not pay the incentives, the retailer is not losing out, rather, it is the manufacturer who loses out. The manufacturers also generate the point-of-sale (POS) information and track the data for the retailers because retailers often do not have the time to do this. Some of the larger corporations are responsible for unaudited sales reports on a weekly basis. These entities also execute and maintain the price point on the shelf and at the register. Because of the volatility of certain things at the retail stores, (e.g., maintenance of SKUs and related pricing information), the manufacturer works closely with the APT field representatives in maintaining the price point. This is an extremely beneficial arrangement for the retailers.

Program Options for Retailers

To promote maximum retailer participation and allow a variety of retailers to participate, the Efficient Products CFL Discount component offered retailers two rebate delivery mechanisms: upstream markdowns and in-store coupons.

Upstream Markdowns

The upstream markdown option was the preferred method for retailer participation in PY 2009 and accounted for 99.8% of total lamps sold. With these partnerships, discounted CFLs are listed at lower retail prices on the shelves and are automatically marked down at the register. Retailers also are required to allow APT to train the sales staff, according to the APT Regional Director of Operations.

To participate in the markdown program, retailers are required to have a centralized automated data system that shows POS data at the individual store level for submission to APT/EFI for incentive payment. These types of systems are typically found in Big Box national chain stores. For stores involved in the markdown program, the Memorandum of understanding (MOU) is

[7] These calls have since become bi-weekly.

typically signed at the corporate retailer level. For example, all of the stores of a particular retailer that are in AEP Ohio's territory may be required to participate in the program and are listed in the MOU. If the retailer has this data extract capability, all of their stores may be included in the markdown program.

In-Store Coupons

Customers purchasing CFLs at stores participating in the instant coupon program receive a discount on program-eligible CFL purchases by filling out and redeeming a coupon at time of purchase. The customer provides their name, address, and CFL information. Customers must also confirm that they are AEP Ohio customers. Customers can purchase a maximum of 12 CFLs at a time (with a separate coupon required for each package). Coupon retailers then submit the completed coupons to EFI for reimbursement of rebate expenditures.

Stores participating in the coupon program most often do not have POS capability, are typically smaller in nature, and tend to be individually owned. These stores typically opt for the instant-coupon program because tracking program-eligible CFL sales is otherwise difficult without a POS system. For smaller retailers, the MOU is signed at the individual store level. This means that each individual store location decides whether or not to sign up for the program. The coupon portion accounts for a much smaller part of the entire program than the markdown offering, accounting for just 0.2% of total CFLs sold.

2.1.2 Marketing Strategy

The marketing of the AEP Ohio Efficient Products CFL Discount component is carried out through a number of means, including APT field representative store visits, online advertising, and in-store sales staff.

APT Field Representatives

APT services each participating retailer through a field representative that comes in from once a week to once every six weeks or so, according to the retailers. Some stores, mainly big box retailers, are seen more often than others. The field representative is responsible for making sure that the retailer is displaying the promotional materials that are required for participation in the program and that product incentives are correct. The field representatives also are responsible for training the employees (lighting, electrical, cashiers, front end and department supervisors, as well as assistant managers) on the program and on the benefits of CFL usage.

According to the APT Regional Director of Operations, the shelving area surrounding qualified products should be labeled with pricing signs identifying AEP Ohio as the sponsor. When evaluating merchandising, the manager ensures that AEP Ohio signage is only associated with qualified products and is presented in a neat and professional manner. POP materials are assessed, including identifying any "missed opportunities" for signage.

The program also receives mention on the AEP Ohio Web site[8], Facebook, and Twitter, which educate customers about ENERGY STAR CFLs, participating retailers, and recycling options. There also is an Online SMART Lighting Store, which allows AEP Ohio customers to receive an immediate discount on CFLs through the online purchase option.

In-Store Sales Staff

The in-store sales staff also plays a key role in educating customers about the program offerings, support of AEP Ohio, and products, according to most of the retailer interviews. Additionally, the APT field representatives, representing AEP Ohio, make in-store visits to promote the program. For the coupon program, retailers keep the coupons in close proximity of the shelves where the CFLs are displayed. Moreover, some retailers noted that the coupons are also available at the register of their stores.

For the markdown portion of the program, there are signs that display the gridSMART and AEP Ohio logos that alert customers to the fact that the "special price" they are paying is made possible through AEP Ohio. Other POP materials include magnets and special pricing stickers that tell customers how to save energy and alert customers that AEP Ohio is sponsoring the markdown program. The signage is often displayed in high traffic areas such as areas near the store entrance or is set up as promotions on end-caps. Retailers highlighted the end-caps as particularly effective in promoting the program.

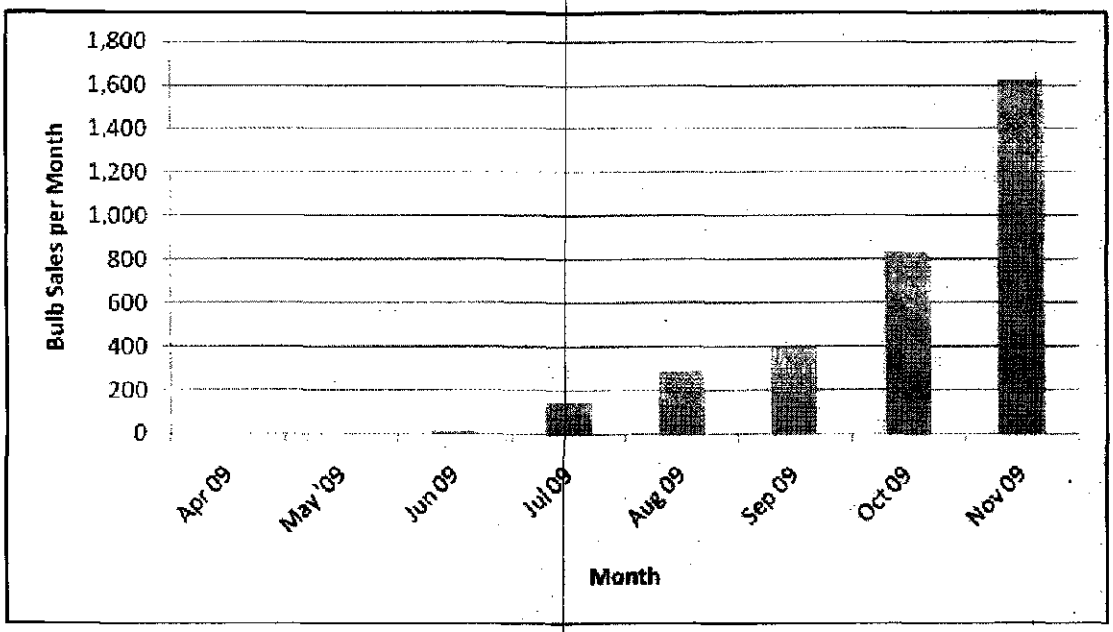
2.1.3 Summary of Program Activity

CFL Sales by Month

Figure 2.1**Error! Reference source not found.** and Figure 2.2**Error! Reference source not found.** summarize the program CFL sales for each month for each delivery mechanism, instant coupon and markdown, respectively. December sales data are not included in the figures due to lag time between CFL sales and data reporting. Figure 2.3**Error! Reference source not found.** shows the cumulative CFL sales, by month for PY 2009.

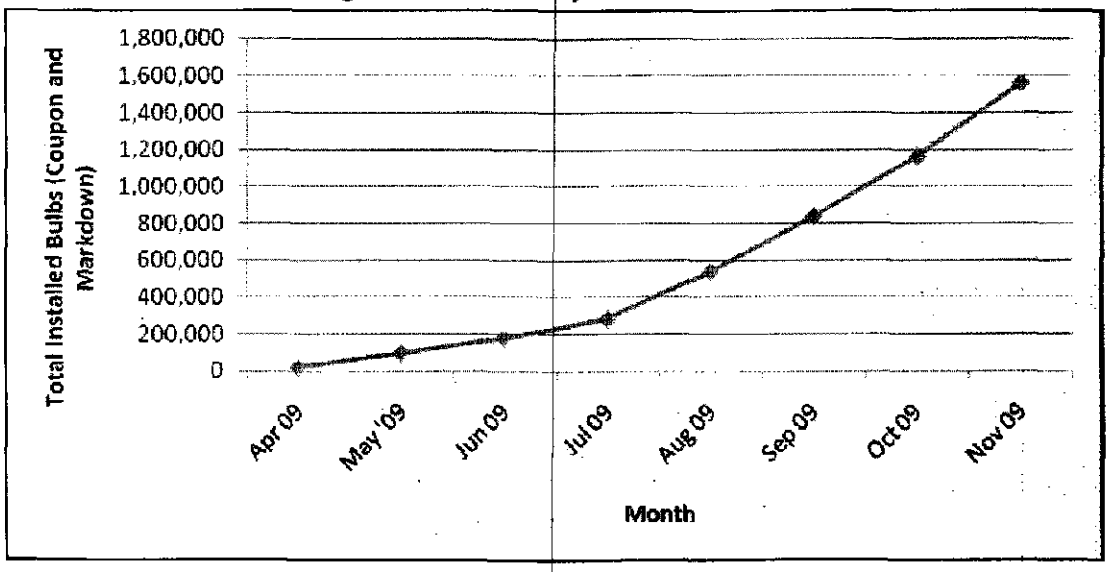
[8] See www.gridsmartohio.com.

Figure 2.2. Coupon CFLs Sold per Month



1. The official program launch was in July 2009, although some preliminary retailers were signed on earlier. Thus, some program-eligible CFLs were sold as early as April.
2. December sales data are not illustrated due to lag time between lamp sales and data reporting.

Figure 2.3. Cumulative Program CFL Sales, by Month



1. The official program launch was in July 2009, although some preliminary retailers were signed on earlier. Thus, some program-eligible CFLs were sold as early as April.
2. December sales data are not illustrated due to lag time between CFL sales and data reporting.
3. For markdown sales, each record included a range from the sales start date to the sales end date for these transactions. In these cases, the evaluation team used the sales start date as the date of installation.

Section 3. Evaluation Methods

This section presents the key questions to be addressed by this evaluation and presents an overview of the analytic methods, with additional detail provided for the methods used in this first year evaluation. It also provides details on the data collection activities implemented for PY 2009, including the data sources and sample designs used as a base for these data collection activities.

Evaluation Questions

This evaluation sought to answer the key researchable questions presented below. This evaluation study is not comprehensive or exhaustive research; rather the study was designed to provide early feedback on program performance for PY 2009.

3.1.1 Impact Questions

1. What are the impacts from this program? What key parameters affect the impact calculations?
2. What is the distribution of different lamp types (CFLs by wattage and specialty lamps) for the lamps sold through the program?
3. Did the program meet its energy and demand goals? If not, why not?

3.1.2 Process Questions

1. Who are the primary stakeholders and how can their association with the program be characterized?
2. How can retailers' perceptions of the program be characterized? What benefits and costs do retailers, both at the corporate and the storefront levels, associate with the program?
3. What are key barriers to participation in the program for eligible AEP Ohio customers? How can the program address them?
4. How do customers become aware of the program? What marketing strategies could be used to boost program awareness?
5. Is the program outreach to customers effective in increasing awareness of the program opportunities?
    a. What is the format of the outreach?
    b. How often does the outreach occur?
    c. Are the messages within the outreach clear and actionable?

6. Are program incentive levels appropriate to encourage participation?

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

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

Analytical Methods

The impact evaluation for the Efficient Products program was performed by obtaining the program tracking data for the Efficient Products CFL Discount component (for both the coupon and upstream markdown market mechanisms) and applying the algorithms for calculating the impact in both energy saved (MWh) and peak demand reduction (MW). The parameters for these calculations were determined from the assumptions behind the 2009 to 2011 Energy Efficiency / Peak Demand Reduction (EE / PDR) Action Plan (herein referred to as the "Program Plan"). Energy savings estimates were performed for both full-year and part-year (where savings can only be counted for months in PY 2009 where the measure was actually installed) scenarios.

3.1.3 Impact Analysis

Energy and peak demand impacts were calculated at the meter. In addition, both full year and part-year energy savings values were prepared. The following algorithms were used to calculate the impacts resulting from the PY 2009 Efficient Products program:

Per-Unit Full-Year Electrical Impact (kWh)	$= ((Watt_{INC} - Watt_{CFL}) \times (CFL_{hours} \times 365))/1000) \times ISR_{CFL}$
Per-Unit Part-Year Electrical Impact (kWh)	$= (\text{Full-Year Savings}) \times (IS_{months}/12)$
Peak Demand Impact (kW)	$= (Watt_{INC} - Watt_{CFL}) \times CF_{Light}$

Table 3-1 provides definitions for the key parameters for savings analysis, as well as the data sources used to estimate the input parameters in the energy and demand savings algorithms for the Efficient Products program. Each of these parameters is described in further detail below. All values used for the impact calculations were either directly derived from the program

tracking data or were taken from the assumptions used for the calculations for the Program Plan.

Table 3-1. Impact Evaluation Parameter Data Sources

Savings Input Parameters	Variable	Description	Data Source
CFL Quantity and Wattage	$Watt_{CFL}$	The number of CFLs (markdown and coupon) of particular wattages distributed through the program.	Program Tracking Data
Baseline Lamp Wattage (Incandescent)	$Watt_{INC}$	Measurement of the baseline wattage of the incandescent lamp displaced by the newly installed program CFL. This value is used to compute the delta wattage after subtracting the program lamp wattage.	2004-2005 DEER Update Study*
Hours of Use (HOU)	CFL_{hours}	The number of hours the lamp is turned on each day.	AEP Ohio Program Plan Calculations**
In Service Months	IS_{months}	The number of months the lamp was installed in PY 2009.	Program Tracking Data
Installation Rate	ISR_{CFL}	In-service rate (or installation rate) per CFL.	N/A for PY 2009
Mean Load Coincidence Factor	CF_{Light}	Summer demand coincidence factor. The percentage of program CFLs turned on during peak hours [weekdays from 4 to 5 p.m.] throughout the summer.	AEP Ohio Program Plan Calculations**

** Source: Itron Inc., 2004-2005 Database for Energy Efficiency Resources (DEER) Update Study. Final Report. Prepared for Southern California Edison, December 2005*

*** Source: Navigant Consulting (Formerly Summit Blue)*

Data Collection Activities

The data collected for the evaluation of the PY 2009 Efficient Products CFL Discount component was gathered during a number of activities, including in-depth phone interviews with AEP Ohio program staff and program implementers at APT and EFI, and in-depth interviews with retailers. **Error! Reference source not found.**Table 3-2 below provides a summary of these data collection activities, including the targeted population, the sample frame, and timing in which the data collection occurred. All of these interviews were completed by telephone in February 2010.

3.1.4 In-Depth Utility and Program Implementation Staff Interviews

The interviews with the AEP Ohio staff focused on program processes to better understand the goals of the program, their roles in the program, and staff perceptions of how the program was implemented and overall effectiveness of the program. As shown in Table 3-2**Error! Reference source not found.**, four in-depth interviews with implementation and utility staff were conducted as part of this evaluation. The evaluation team interviewed two AEP Ohio staff members: the program manager, officially titled EE/PDR Consumer Programs Coordinator, and the Consumer Programs Manager responsible for overseeing all residential program activities at the utility.

Interviews also were conducted with staff members of the program implementers, including the APT Regional Director of Operations, and the EFI Utility Division Program Manager. The interview with the APT Regional Director of Operations explored the implementation of the program in more detail and also covered areas of data tracking and quality assurance. The interview with the EFI representative also explored the program implementation and focused primarily on payment processing and program tracking data. The interview guides used for these interviews are included as Appendices.

Table 3-2. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
In Depth Phone Interviews	Participating Retailers – Instant Coupons	Coupon Tracking Database	5 store-level managers from participating instant-coupon retailers	4	February 2010
	Participating Retailers – Markdown	Markdown Tracking Database	5 store-level managers from participating markdown retailers	8	February 2010
	Efficient Products Program AEP Ohio Staff	Contacts from AEP Ohio	Consumer Programs Coordinator, AEP Manager of Consumer Programs, AEP	2	February 2010
	Efficient Products Program Implementers	Contacts from APT & EFI	Regional Director of Operations ,APT Program Manager, Utility Division, EFI	2	February 2010

Note: Purchases of CFLs made though the Online SMART Lighting Store are included in the Markdown Tracking Database.

3.1.5 In-Depth Store-Level Retailer Interviews

The evaluation team also conducted twelve interviews with participating retailers. These retailers are divided into two groups, based on their type of participation ("instant coupon" or "markdown"). It should be noted that the sample design for Participating Retailer interviews was not a simple random sampling strategy. Rather, the evaluation team rank-ordered retailers in descending order by sales volume, and calls were made first to stores where the most program-eligible CFLs had been sold. This was done so that the evaluation team could prioritize feedback from those stores which were most actively involved, and so that the evaluation team could learn from these stores what had motivated them to participate and determine what, if anything, would keep them from participating in the future. The evaluation team also sought to speak to an equal number of instant-coupon retailers and markdown retailers.

The interviews were conducted with store-level managers or sales staff familiar with the CFL program. For the larger Big Box stores, staff interviewed were store-level managers, who primarily were unfamiliar with out-of-store corporate-level processes such as MOU arrangements or reimbursements. At the smaller stores, the interview participant was often the store owner, and these interviewees were more often aware of the MOU arrangements.

Section 4. Program Level Results

This section presents detailed results of the impact and process evaluations of the Efficient Products CFL Discount program.

Impact Evaluation Results

4.1.1 Program Impact Parameter Estimates

Two key pieces of information are needed to calculate the program-level electrical energy and peak demand impacts of the Efficient Products program: the number and type of CFLs distributed through the program, and the per-unit impact of each lamp. The number and type of CFLs distributed through the program were provided by the program tracking data for both the coupon and markdown delivery mechanisms. The per-unit energy and demand savings were calculated using the following algorithms and associated variables:

Per-Unit Full-Year Electrical Impact (kWh) = $((Watt_{INC} - Watt_{CFL}) \times (CFL_{hours} \times 365))/1000) \times ISR_{CFL}$

Per-Unit Part-Year Electrical Impact (kWh) = (Full-Year Savings) X ($IS_{months}/12$)

Per-Unit Peak Demand Impact (kW) = $(Watt_{INC} - Watt_{CFL}) \times ISR_{CFL} \times CF_{Light}$

$Watt_{CFL}$ = CFL Wattage (Program CFL)

$Watt_{INC}$ = Baseline Lamp Wattage (Incandescent)

CFL_{hours} = Hours of Use (HOU)

IS_{Months} = In Service Months

ISR_{CFL} = Installation Rate

CF_{Light} = Mean Load Coincidence Factor

A detailed discussion of each parameter is provided below, including information on how each value for these assumptions were chosen for the calculations.

Program CFL Distribution

The number of CFLs distributed through the program is a key parameter in the calculation of program impacts and is used to determine the per-lamp savings estimates and to extrapolate those per-lamp savings to the program level.

Table 4-1 below provides the total number of CFLs sold through the program by lamp wattage. Eighty-five percent (85%) of the program CFLs sold were low-wattage lamps (20 watts or less). This wattage figure is based on the Efficient Products tracking data provided to the evaluation team by AEP Ohio.

Table 4-1. Distribution of Program CFLs, by Wattage

CFL Wattage Range	[illegible]	[illegible]
< 13 Watts	140,575	7.9%
13 to 17 Watts	1,274,189	71.8%
18 to 20 Watts	87,670	4.9%
21 to 28 Watts	266,694	15.0%
≥ 29 Watts	5,839	0.3%
Total	**1,774,967**	**100.0%**

Source: AEP Ohio Tracking data

The evaluation team did not have access to detailed data on specialty lamps included in program sales because this information is not tracked by the program. The evaluation team suggests that AEP Ohio track the most popular specialty lamp types to increase understanding of how these lamps are bought through the program and how they affect program savings.

Determining Delta Wattage

Primary data on the wattage of the incandescent lamps replaced by the purchased lamps was not available for this evaluation. To estimate the delta wattage between the program CFL and the baseline incandescent lamps it replaced, the evaluation team used assumptions from the 2004-2005 California DEER update study. In some cases there was no equivalent incandescent bulb wattage indicated in the DEER update, or the assumed wattage of the replacement CFL depended on the lumens of the bulb, and lumens were not included in the program tracking data. In these cases, the higher replaced incandescent wattage was used for the analysis. The table of conversions used by the evaluation team is included in Table 4-2.

Table 4-2. Incandescent to CFL Conversion Table

Typical Incandescent Wattage	CFL Wattage
40 Watts	< 13 Watts
60 Watts	13 to 17 Watts
75 Watts	18 to 20 Watts
100 Watts	21 to 28 Watts
150 Watts	≥ 29 Watts

Source: Itron Inc., 2004-2005 Database for Energy Efficiency Resources (DEER) Update Study. Final Report. Prepared for Southern California Edison, December 2005

The delta wattage was found by using table 7 to determine the incandescent replacement wattage and then subtracting the CFL wattage. Using this method, the average delta wattage across all program CFLs was determined to be 50.16 watts.

CFL Installation Date

Savings for the AEP Ohio program were determined on a part-year basis, where savings are claimed based on the month of installation to the end of the year. For this reason, the CFL installation date is an important variable for savings calculations. For coupon sales, the CFL installation date was assumed to be the date of purchase of the CFLs. For markdown sales, the sale date was not given for each purchase, since retailers submitted semi-regular accounts of sales over a period of time. In these cases, each record included a range from the sales start date to the sales end date for these transactions. In these cases, the evaluation team used the sales start date as the date of installation. It should be noted that some submittals included some sales periods that extended into the first or second of January 2010. This potential overestimate was only from one or two days of 2010, and only involved two retailers, so the effect of this is estimated to be only roughly 3 MWh (or less than 0.01%).

In some cases the sales start date was missing. In these cases the sales end date was used as the installation date. This would slightly underestimate the savings for these records, as it would, in some cases, result in fewer months of realized savings.

Installation Rate

In order for the Efficient Products program to receive credit for energy savings for a program CFL within a given program year, it must be installed within that program year. The AEP Ohio program is a first-year program where CFL saturation is assumed to be low and the installation rate is assumed to be high. The evaluation team lacked primary data on the installation rate within the AEP service territory, so PY 2009 savings were based on the assumption that 100% of the lamps purchased were installed in PY 2009. Future evaluation efforts will include a focus on estimating CFL installation rates for this program.

Hours of Use

Average daily hours of use (HOU) is a key parameter in the estimation of impacts. In order to estimate the energy savings resulting from a newly installed CFL, it is necessary to understand the number of hours the lamp is turned on each day (which can then be annualized by multiplying the daily value by 365 days). Assuming you have two lamps that have displaced the same number of watts, the lamp that is turned on for a greater percentage of time over the course of the year will yield a larger number of kilowatt hours saved. Savings calculations were determined using the HOU assumption from the AEP Ohio Program Plan.

Peak Coincidence Factor

The peak coincidence factor measures the percentage of lamps that the program CFLs were turned on during AEP Ohio's peak time period (4 to 5 p.m. on summer weekdays). Savings calculations were determined using the coincidence factor assumption from the Program Plan.

4.1.2 Program Impact Results

Based on the impact parameter estimates summarized above, the evaluation team estimated the program impacts resulting from the PY 2009 Efficient Products program. The inputs to the impact calculations and the resulting estimated energy savings and peak demand reduction are provided in Table 4-3.

Table 4-3. Energy Savings and Peak Demand Reduction Estimates

Input to Impact Calculation	Value	
Program CFL Sales	1,774,967	
Average Displaced Watts (Delta Watts) per CFL	50.16	
Average Daily Hours of Use	2.28	
Installation Rate	100%	
Peak Load Coincidence Factor	0.056	
Program Impacts	**Full-Year Savings**	**Part-Year Savings**
Average kWh Yearly Impact per unit	41.73	12.56
Total First-Year MWh Savings	**76,876**	**22,297**
kW Reduction Per Unit	0.0028	
Total First-Year Peak MW Reduction	**4.98**	

The first-year goal of the Efficient Products program was to produce 40.8 GWh of electrical energy savings and 4.7 MW of peak demand reduction. This evaluation reveals that AEP Ohio exceeded the energy savings goals (based upon full-year savings), achieved about half of the goal as measured using the part-year savings convention, and slightly exceeded the peak demand reduction goal. The ex-ante full-year savings for PY 2009 were 76,865 MWh and 5.17 MW, which results in a realization rate of 96% for both energy and peak demand savings.

PY 2009 full-year savings and realization rates are broken down by utility in Table 4-4. The difference between ex-ante and ex-post savings estimates is driven by a difference in determining the wattage of the baseline incandescent lamps that are replaced by the CFLs, with all calculations based on a 96% realization rate.

Table 4-4. Energy Savings and Peak Demand Reduction Estimates, by Utility

Utility	CFLs Sold	Net kWh Energy Savings	Net MWh Energy Savings	Energy Realization Rate	Net kW Peak Demand Reduction	Net MW Peak Demand Reduction	Peak Realization Rate
		MWh	MWh	Percent	MW	MW	Percent
Columbus Southern Power	1,003,672	43,520	41,932	96%	2.93	2.82	96%
Ohio Power Company	771,295	33,350	32,144	96%	2.24	2.16	96%
AEP Ohio Total	**1,774,967**	**76,870**	**74,076**	**96%**	**5.17**	**4.98**	**96%**

Process Evaluation Results

The process evaluation of the Efficient Products program focused on perceptions of the program operations and delivery including the market outlook and retailer participation, as well as satisfaction with the program, current challenges, and other potential process-related issues.

Data sources for the process evaluation included four in-depth interviews with program staff, including the AEP Ohio EE/PDR Consumer Programs Coordinator and sector manager, the APT Regional Director of Operations, and an EFI representative.

4.1.3 Market Outlook

Representatives from AEP Ohio and the program implementation contractors agreed that the market potential for CFLs is large in the AEP Ohio service territory. The interview participants from AEP Ohio and APT are confident in the program's ability to deeply penetration into the residential lighting market of AEP Ohio customers.

Additionally, according to the APT Regional Director of Operations, the market for CFLs is shifting in the AEP Ohio service territory. In fact, the lighting market nationwide is shifting, APT believes that where supermarkets and groceries used to be the place to buy lighting, now over 50% of lights (all lights, not just CFLs) are bought in Do-It-Yourself (DIY) stores (e.g., Lowes, Home Depot, Menards). As such, the APT Regional Director of Operations believes, the marketing focus should be on DIYs and Big Box stores instead of smaller groceries, because this

is where most CFL purchases are currently made. APT also explained that it is much more cost effective for the program to focus on the DIY stores because the CFL is a major product for that market channel, and thus DIYs and Big Box stares are more motivated to participate in the program.

4.1.4 Retailer Participation

As mentioned previously, several different types of retailers are participating, including DIYs, Big Box stores, large pharmacy chain stores, smaller hardware, pharmacy and lumber stores, and independent grocery stores. The participation of these stores varies in both quantity and style. Each company signs its own MOU agreement, which outlines in what capacity the store will participate, the requirements for each stakeholder involved, and other arrangements.

Some of the larger chains are signing up for the markdown program, whereas many of the smaller stores and one particular larger store tend to utilize the coupon option. The instant coupon feature is utilized at those stores or locations that do not have the capability or are not willing to track the program-eligible CFL sales. This includes a total of 15 to 20 storefronts, including all stores of one DIY chain. Retailers in this group appear to choose the coupon feature instead of the markdown feature for the ease of use or because they do not see a large benefit to the markdown program.

At this time, AEP Ohio is trying to encourage the DIY chain to participate in the markdown portion of the program. This is uncommon, in that APT usually plays this role. However, according to the EE/PDR Consumer Programs Coordinator, AEP Ohio has developed relationships and channels through other departments with this particular chain and is working on utilizing those channels to influence that company to sign up for the markdown program.

Retailers learned about the program in one of two ways. In the case of many of the larger corporations, the interviewee heard about it from higher up the chain, such as the "Home/Corporate Office." In the case of smaller stores, they learned about the program directly from a visitor to the store that represents AEP Ohio. It is unclear how the corporate level first learned of the program at this point, but it is certain that APT is establishing the agreements with these companies and maintaining relationships.

The overall market participation by retailer category as it currently exists is shown in Table 4-5. This table indicates that claims made by APT are accurate, since 93.5% of the CFLs sold under through this program are sold in Big Box or DIY stores. A total of 99.8% of the CFLs are sold through the markdown delivery mechanism.

Table 4-5. Rebated CFLs Sold by Retailer Category and Delivery Mechanism

Retailer Category	CFLs Sold	Percent of Total CFLs Sold	Number of Stores	Percent Markdown	Percent Coupon
Big Box/Corporate-Owned DIY	1,640,327	93.5%	99	93.4%	0.1%
Grocery	50,585	2.9%	102	2.9%	0%
Individually-Owned or Franchised Hardware	9,799	0.6%	56	0.5%	0.1%
Pharmacy	14,653	0.8%	115	0.8%	0%
Other	38,777	2.2%	94	2.2%	0%
Total Coupon	**4,280**	**0.2%**	**42**	—	—
Total Markdown	**1,749,861**	**99.8%**	**424**	—	—
Total Program	**1,754,141**	**100%**	**466**	—	—

Source: Efficient Products Tracking Data

4.1.5 Satisfaction with the Program to Date

The various parties involved in the program are by and large satisfied with the program operations to date. In fact, all interviews, including the four in-depth interviews with program staff at AEP Ohio, APT, and EFI, as well as the twelve interviews with retailers, illustrate widespread satisfaction with the program benefits and processes. Retailers believe the program is helping their business sell high quality CFLs. AEP Ohio views the program as successful because the program savings and participation rate goals were met. Both APT and EFI stated that program processes are functioning well and that the there are no major issues or challenges with the process at this time, as it is well-developed from past experience with other programs and the "national perspective" of APT. While this evaluation did not directly collect customer feedback for PY 2009, retailers were able to report on their perceptions of customer satisfaction.

Retailers

The retailer perspective on the program processes was examined through the twelve interviews with contacts at retailer storefronts. According to interviews with store-level sales staff and managers, participating retailers are seeing increased sales of units and are stocking more units, and for these reasons are generally very satisfied with the program. Many retailers also stated that the program requires little effort on their part, other than making the customer aware of AEP's offer to save them money.

Retailers also are particularly satisfied with the quality of the products offered through the program. Although all the retailers previously sold ENERGY STAR CFLs before the program

existed, retailers are very pleased with the choice of products offered under the program. The store-level managers interviewed typically are so satisfied with the products that managers have installed them in their own homes, even replacing all of their personal incandescents with CFLs. The fact that managers have personally installed the equipment becomes a sales point for the sales staff, as emphasized in a few of the retailer interviews. Both specialty lamps and non-specialty lamps are being sold through the program and customers have made very few complaints about the products. In fact, the only customer complaints ever mentioned by the retailers were about mercury content or higher price. (The issue of disposal of CFLs will be discussed below.)

Applied Proactive Technologies (APT)

Many of the key successes highlighted by those interviewed revolve around the role of the program implementer, APT. Many of the retailers interviewed for this study highlighted the presence of the APT field representatives in their stores. The retailers often know the field representative on a first name basis, and importantly, directly relate APT staff to AEP Ohio. In fact, not one store representative interviewed mentioned APT; all were associating the field representatives with AEP Ohio, not the implementer. There is no direct communication between AEP Ohio and the retailers, though, importantly, APT is unmistakably representing the utility in the field and utilizes the "gridSMART" label, as indicated by several store-level representatives.

The program implementer, APT is in direct contact with the retailers on a regular basis. The interviews with representatives from the DIY and Big Box stores made it clear that the field representatives pay nearly weekly visits to these stores. The smaller stores may be visited less frequently, but still tend to believe the visits occur often enough, such as every six weeks or so. Some of the larger companies may have a store manager that is heavily involved in the program, but it is important to point out that this same person may not always be working at the time of each visit by their field representative. As such, interviewees indicated that the field representative may be at times visiting their store when they are not scheduled to work.

The training of sales staff is something APT strives for through its implementation of the program, as noted by the Regional Director of Operations of APT and by several retailers. Some retailers reported receiving training on how the program works by the field representative through one of the initial in-store visits. Store staff also has been given a program manual explaining details of the program processes. Those retailers that spoke about such training events or materials were satisfied with the process. None of the retailers spoke negatively about trainings that may have occurred in their stores. However, a couple of retailers mentioned that they were unaware of whether trainings had ever occurred at their store. It is possible that other staff at the store had received the training and that the interviewee we spoke with was simply unaware of the training.

Increasing Number of Retailer Participants

The AEP Ohio Consumer Programs Coordinator emphasized the program's success as shown through the number of retailers involved. One indicator of success to date is the increased participation of retailers over time. It is apparent that participation of retailers at the store-level has been steadily increasing since the program began, according to the latest data available, and the first date of reported sales for each store. By reviewing the program data entries by MOU for the markdown portion of the program, it can be seen that at least one retailer only began reporting data in December 2009. It is apparent that many new MOUs were still being signed in the later months of the year. This demonstrates that new storefronts are continuing to become involved as well. New corporate or business involvement spanning over the year is summarized in Table 4-6.

Table 4-6. Number of New Corporations Reporting Data by New MOU Agreements by Month

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Businesses Reporting New MOU	4	0	1	4	6	5	2	1	1

Source: Efficient Products Tracking Data

4.1.6 Challenges

Looking ahead, AEP administrators and retailers see a number of challenges facing the program. The issues that loom largest in AEP Ohio administrators' minds are related to legislative changes at the national level that will significantly alter the landscape of the lighting products market. Other issues relate to gaining cooperation of retailers in recycling CFLs, confusion among retail employees about program specifics, and some challenges with program requirements.

Pending Federal Legislation

Foremost on program administrators' minds at AEP Ohio, and more generally to all utilities with CFL-related energy efficiency programs in the United States, is how to best plan for a major shift in the CFL landscape resulting from a federally-mandated increase in the efficiency required from incandescent lamps to be phased in beginning January of 2012. Administrators are thinking about how AEP Ohio's portfolio and program-level strategies and goals might be adjusted to reflect this new reality. Also uncertain is how these changes will affect current partnerships AEO Ohio has cultivated with participating retailers in the Efficient Products programs, how best to work with retailers to ensure they remain committed and engaged in the program, and that the momentum developed is not lost.

During the interviews, several retailers mentioned encouraging customers to buy the CFLs on discount "while they can" because CFLs might not be discounted in the future if CFLs are the only lamp available on the market. It is unclear how widespread "frontloading" of CFLs is, but

such efforts might increase if AEP Ohio is not able to manage how retailers respond. Program evaluators should work with AEP Ohio to develop a transition plan for managing this change among retailers and consumers.

Retailer Recycling of CFLs

Participation in CFL recycling programs by retailers is reportedly uneven. An informal audit of compliance along with determination of barriers to its compliance and possible solutions should be a worthwhile effort as the proportion of CFLs sold relative to incandescents continues to grow. These issues should be explored during the 2010 program year.

Proper CFL Disposal

The Efficient Products Consumer Programs Coordinator of AEP Ohio believes that AEP Ohio needs to be more involved in recycling. He mentioned some successes, in particular, that thirteen Home Depot™ stores are already accepting and recycling the CFLs. Still, many other retailers do not yet have a system in place for proper disposal of the lamps. Several retailers mention that a common concern of customers when considering purchasing CFLs is the mercury content.

APT's documentation on the Efficient Products program, which is provided to participating retailers, includes detailed information on the issue of proper CFL disposal. Because mercury remains a concern of some customers, it is important to continue to educate the public about safely recycling CFLs and to support retailer efforts at recycling. A study into the barriers associated with instituting CFL recycling receptacles and programs may be warranted. The program evaluation for program year 2010 will ask customers about their perceptions regarding the importance of proper CFL disposal.

Confusion about Program Specifics among Retailer Employees

Some store-level staff for the larger retailers mentioned they sell a few energy-efficient lighting products that are not included in the program, which may be reflected in the MOU agreed upon. It is unclear whether these products are discounted at other stores. While anecdotal, there may be inconsistent understanding of the program, even among staff working for the same corporation. AEP Ohio may want to offer continued training on program specifics to reinforce program knowledge and to make sure all new employees have been trained on the program. Stocks of brochures that highlight program purpose and specifics may need to be replenished on a more frequent basis.

Uncertainty of Program Benefits

Markdown participants also face another uncertainty. For the Big Box, DIY and other retail chain corporations, the individual stores may not fully receive a financial benefit according to some representatives from the storefront level. Some store sales staff (e.g., lighting department managers) question the arrangement for the reimbursement process or more often are unclear

how it is arranged. Even though they are selling the products, the store manager claims the financial benefit may not be reaching their storefront.

Instant Coupon Requirements

The time it takes for customers to fill out the forms is a common concern among retailers participating in the "instant coupon" portion of the program. These include a DIY chain and small hardware stores that do not have a POS retail and inventory system. The AEP Ohio Consumer Programs Coordinator also acknowledges this challenge. One retailer claimed the requirement limits the impact of the program because customers are not always willing to take the time to fill out a different form, including some of the same information, for each coupon. Another smaller retailer said it did not actually limit the number of sales, but does give customers a bit of a negative impression of how the program works.

Installation Rate

This evaluation did not collect primary data to estimate a CFL installation rate. Because the installation rate is a key element of program savings estimates, a key research objective to be addressed in future evaluations is to estimate the installation rate of CFLs purchased through this program.

This section addresses the cost effectiveness of the Efficient Products program. Cost effectiveness is assessed through the use of the Total Resource Cost (TRC) test. **Error! Reference source not found.** summarizes the unique inputs used in the TRC test.

Table 4-7 Inputs to Cost-Effectiveness Model for Efficient Products Program

Item	CSP	OPCo	Combined
Measure Life	5	5	-
Participants	2,755	2,136	**4,891**
Annual Energy Savings	5,802,030	4,173,744	**9,975,774**
Coincident Peak Savings	389	302	**691**
Third Party Implementation Costs	$319,673	$247,820	**$567,493**
Utility Administration Costs	$95,901	$76,912	**$172,813**
Utility Incentive Costs	$68,875	$53,400	**$122,275**
Participant Contribution to Incremental Measure Costs	$0	$0	**$0**

Based on these inputs, the TRC for CSP is 5.6 and 5.5 for OPCo, the program passes the TRC test in each utility and for the program in its entirety. **Error! Reference source not found.** summarizes the results of the cost-effectiveness tests. Results are presented for the Total Resource Cost test, the Participant test, the Ratepayer Impact Measure test, and the Utility Cost test.

Table 4-8 Cost Effectiveness Results for Efficient Products Program

Test Results for Prescriptive	CSP	DPLC
Total Resource Cost	5.6	5.5
Participant Cost Test	41.5	45.0
Ratepayer Impact Measure	0.3	0.3
Utility Cost Test	4.9	4.6

At this time, additional benefits related to reduction of greenhouse gas emissions have not been quantified in the calculation of the TRC. These additional benefits would increase the given TRC benefit/cost ratio.

Section 5. Conclusions and Recommendations

This section highlights the findings and recommendations stemming from this evaluation of the Efficient Products CFL Discount component. The primary objectives of this study were to quantify the impacts resulting from discounted CFLs sold through the Efficient Products CFL Discount program and review program processes based on insights provided from the perspectives of those most closely involved in program implementation. Below are the key conclusions and recommendations.

Conclusions

The impact evaluation utilized program tracking data and assumptions about the CFL installation rate and other parameters to estimate energy and peak demand impacts in PY 2009. This evaluation concludes the following:

- Consumers purchased 1,774,967 CFLs that were discounted through this program.
- The average displaced Watts per CFL is 50.16 W.
- Assuming full-year savings, the average annual kWh savings per unit is 41.73 kWh. The total first-year energy savings is 74.1 GWh.
- Assuming partial-year savings, the average annual kWh savings per unit is 12.56 kWh. The total first-year energy savings is 22.3 GWh.

The evaluation team completed interviews with AEP Ohio staff, members of the program implementation team, and store-level managers or sales staff of participating retailers in support of this evaluation. The following conclusions were drawn from those interviews.

- Marketing efforts included the use of the gridSMART label, utilizing product displays at the end of aisles ("endcaps") for promotions, and providing educational bill inserts to AEP Ohio residential customers informing them about the options available to them at retailers nearby their place of residence.
- The AEP Ohio staff members interviewed are very satisfied with the work of the program implementer, APT. The retailers who were interviewed are similarly satisfied with how the program has been implemented to date. In particular, retailer staff members are particularly satisfied with the field representatives and indicate APT is doing a good job at building relationships with retailers at this level.

Current challenges include the following:

- In reviewing the program tracking data, the evaluation team found room for improvement in the markdown data tracking, which accounts for 99.8% of program

- The program team should continue to provide training to participating retailers that emphasizes the benefits to sales staff of encouraging sales of qualifying products. This should help ensure that store managers and sales staff feel that the program is worth their personal time promoting CFL purchases to customers.

- The program should consider increased efforts in promoting and investing in proper disposal of CFLs among its participating retailers. While concerns over mercury are not widespread, it will continue to be important to reinforce communication with respect to safe disposal of CFLs. Along with this communication, consumers will need access to CFL recycling depositories to ensure they are not burdened or concerned with proper disposal and the repercussions of improper disposal. AEP should continue to encourage recycling of CFLs by supporting retailers that have disposal programs in place.

Participation in CFL recycling programs by retailers is reportedly uneven. An informal audit of compliance along with determination of barriers to its compliance and possible solutions is a worthwhile effort as the proportion of lamps purchased that are CFLs continues to grow. These issues should be explored during the 2010 program year.

- AEP Ohio should complete the development of the program operations manual to guide activities and outline program processes for AEP Ohio staff. The Consumer Programs Coordinator highlighted that roles and responsibilities for AEP Ohio staff will become more formalized once the Manager of the Consumers Programs develops this manual.

- AEP Ohio should develop a clear path for addressing the 2012 required increase in incandescent efficiencies by outlining the potential effects on the Efficient Products program and laying out alternative paths to react to the pending legislation.

- Using the data available in this study, it was not possible to assess how widespread customer or retailer dissatisfaction might be due to the inconvenience associated with the instant coupons; this would require a more systematic survey of customers and retail partners. Coupon retail participants mainly consist of one DIY chain and smaller independently owned hardware stores. Creating process improvements for coupon customers to make the process less burdensome may be a prudent investment in these relationships that may determine whether they feel they will be supported in future partnerships with AEP Ohio.

- AEP should track sales of specialty lamps (e.g., globes, reflectors, A-lamps, 3-way, dimmables) to understand how the sales of these lamps affect the program. Accurate estimates of the extent to which specialty lamps are sold in the program would not be possible without detailed POS data that included all lamp types.

Section 6. Appendices

The data collection instruments used in this evaluation consisted of the program participant survey and in-depth interview guides for the implementation contractors, AEP Ohio program manager, and retailers.

Implementation Contractor Interview Guides

6.1.1 Implementation Contractor Interview Guide: Efficient Products – Lighting

APT Interview Guide

Interview Objectives:

- Assess effectiveness/efficiency of program operations & delivery
- Characterize marketing strategies

Introduction

First we would like to give you some background about who we are and why we want to talk with you today. EMI is an independent consulting firm that works with electric and gas utilities to review and improve program operations and delivery.

We are part of the team hired to conduct an evaluation of AEP Ohio's energy efficiency programs, and we're currently in the process of conducting interviews with program managers and key staff in order to improve our understanding of those programs. At this time we are interested in asking you some questions about the Efficient Products program so that we can get your insights into what is working well and not working well with the program, from your perspective.

Before we get started, can you take a moment and explain your role and scope of responsibilities with respect to AEP Ohio's Efficient Products Lighting Program? How long have you held this position?

Next, I'm going to ask you some questions about some of the practical aspects of the Efficient Products Lighting Program.

Implementation Process

Please describe APT's involvement in this program.

- Manufacturer recruitment
- Retailer recruitment
- Retailer training

- Additional probes if needed (roles, responsibilities, deliverables)

Can you describe the relationship between APT and EFI with respect to the program? What is each party responsible for? What responsibilities are shared?

Manufacturer & Retailer Recruitment

Please describe the process of recruiting and enrolling manufacturers to participate in this program.

- What are the reasons manufacturers participate in this program?
- Do interested manufacturers ever contact APT to participate?
- Are you satisfied with the mix of manufacturers involved in the program?

Please describe the process of recruiting and enrolling retailers to participate in this program.

- What are the reasons retailers participate in this program?
- It sounds like the manufacturers that are targeted then partner with retailers to participate in the program. Is that right?
- Do interested retailers ever contact APT to participate?
- Are you satisfied with the mix of retailers?
- Is there sufficient geographic distribution of retail locations? Has this met program expectations?

Retailer Training

Could you describe the training for retailers?

- What is the purpose of the training?
- How does the training occur? How long is the training? Is it one-shot or multiple visits?
- Is it a formal training in more of a classroom setting, or is it a one-on-one type training?
- How soon after becoming a participant does training take place or is it a prerequisite before they can offer program discounts?

Are there any handouts or materials that are typically given to store employees? Can you please provide copies of these handouts?

If you could start from scratch, is there anything about retail training you would have done differently?

Store Visits

Does APT regularly visit participating retail stores?

- What happens during these visits?
  - Is there a checklist? Can we get a copy of the checklist?
  - Other forms?
- How are visits documented and communicated to AEP Ohio?
- How are decisions made as to which retailers get visited and how often?

Is there a quality control procedure to make sure that stores are well stocked, staff is well-trained, and POP materials are displayed correctly? Please provide a brief description.

- What processes in place in terms of documenting and reporting? Can we get copies of the procedures and any reports of quality checks in the field?

In general, what have the field representatives been finding in their store visits in terms of:

- Program bulbs stocked and visible?
- Prominence of POP materials?
- Store employees' knowledge of the program? How is this determined?

Payment Processing

Could you describe the payment process between EFI and the manufacturers?

- What is the sequence of events leading to the mailing a check? What are the trigger points for each next step to occur?
- What is the average number of days between when a manufacturer is eligible for a check and the mailing of the check?
- Have manufacturers made any comments about the time it takes them to receive a check?

Could you describe the payment process between EFI and the retailers?

- What is the sequence of events leading to the mailing a check? What are the trigger points for each next step to occur?
- What is the average number of days between when a retailer is eligible for a check and the mailing of the check?
- Have retailers made any comments about the time it takes them to receive a check?

Are there places in the process when there's a hang-up? What are they? How do they get detected? (e.g., manufacturer or retailer calls)

How/when do you find out if there have been any problems with manufacturers/retailers not submitting all of the required information?

Marketing to Retailers/Manufacturers

How is the program marketed to retailers/manufacturers? Can you describe how stores/manufacturers become aware of this program?

Has the level of marketing and promotion been appropriate so far?

- Were the promotional efforts successful overall?

What do retailers think about the level of incentives?

What do manufacturers think about the level of incentives?

If you had to start this program from scratch, what would you do differently with respect to marketing and outreach?

Marketing to Consumers

What do you perceive to be the level of satisfaction among program participants with the current discount amounts (or prices of bulbs)?

- How do you determine this?

Please tell me about the marketing materials you develop for use in the retail stores.

Are you able to send me (or direct me to) copies of the marketing materials that have been developed for this program?

What plans are in place for future marketing efforts? Do you plan on making any changes?

Data Tracking

I would like to talk a little bit about the program tracking systems.

Can you briefly describe what data are tracked for this program and how the data is collected?

- Do you always receive sales data (vs. shipping data)?
- Do you always receive data on the store level?
- How frequently are sales data updated? Weekly, bimonthly, monthly?

Are you able to take timely action to make corrections based on the program tracking systems?

- How confident are you in the accuracy of the database?
- How frequently do you look at reports created based on this data?
- What do you do if data are missing?
- Do you know of any issues currently with missing data? (i.e., retailers that aren't providing store level data, etc.)

Communication

How often does communication occur between people and/or departments in AEP Ohio and people and/or departments at APT?

- Can you generally describe the lines of coordination and communication with AEP Ohio?
- Does communication primarily occur when a problem comes up, or are there regularly scheduled meetings? How easy or difficult is it to get in touch with someone at AEP Ohio when an issue arises?
- If regularly scheduled, how often?

How is that going in general? Do you feel information is shared in a timely fashion?

- If interviewee reports any challenges, clarify nature, then ask:
  - What effects, if any, is this having on program progress?
  - What is being done about that? Do you think that will fix things?
  - If you could rebuild the program from scratch, what would you do differently in terms of established procedures for communication?

Can you describe the relationship between APT and EFI with respect to the program? What is each party responsible for? What responsibilities are shared?

Are there regular interactions between APT and EFI?

- Please describe.

- How is that going in general? [Probe.]

CFL Recycling Program

Please describe APT's role, if any, in promoting the AEP Ohio CFL recycling program to retailers.

- How is the implementation of this program going?
- Is EFI involved at all?
- How have you been promoting it to retailers in the program?
- What about those retailers that are not enrolled in the program?
- Approximately how many retailers are currently participating?
- What is your goal for participating retailers?
- How is the program being marketed to AEP Ohio consumers?

Program Strengths/Areas for Improvement

What would you say is working really well?

What would you most like to change?

Is there anything that seems to stand in the way of making those changes at this time?

Summary

It's important for us to review what we heard you say in terms of key obstacles and issues you believe exist with this program. [Summary of key issues and observations].

- I heard you talk about X challenges to the programs [list the challenges reported]. Could you give a percentage to each of these that add up to 100% in terms of how detrimental they are to achieving the goals for the Efficient Products Lighting program?

We are also planning on talking with EFI. Who is the best person to interview there? Can you provide his/her contact info?

Do you have anything else about the program that we didn't discuss that you would like to make sure I know about?

Thank you very much for taking the time in assisting us with this evaluation. Your contribution is a very important part of the process. If I come up with any additional questions that come from this interview do you mind if I send you an email or give you a call?

Program Manager Interview Guide

6.1.2 AEP Program Staff Interview Guide: Efficient Products

Interview Objectives:

- Determine effectiveness of program design
- Determine effectiveness of marketing efforts
- Assess effectiveness/efficiency of program operations & delivery

Introduction

First we would like to give you some background about who we are and why we want to talk with you today. EMI is an independent consulting firm that works with electric and gas utilities to help ensure the attainment of energy efficiency goals.

We are part of the team hired to conduct an evaluation of AEP Ohio's energy efficiency programs, and we're currently in the process of conducting interviews with program managers and key staff in order to improve our understanding of those programs. At this time we are interested in asking you some questions about the Efficient Products program so that we can get your insights into what is working well and not working well with the program, from your perspective.

Before we get started, can you take a moment and explain your role and scope of responsibilities with respect to [program]? How long have you held this position?

Program Structure/Design

Can you please describe the various components of the program?

- Lighting – instant markdown and coupons
- Lighting – online store
- Recycling of CFLs – bins in retail store and mailers

Do you feel like you have a good sense of how each aspect of the program is going in terms of reaching its targets?

Outside of the quantitative goals (e.g., $, $/kWh, savings and participation rates), in your own words, what are the key goals and objectives of this program?

Is there an implementation plan or program operations manual that you can send me?

Has anything changed with respect to the structure or design of the program since it

was first implemented?

Marketing/Outreach

Can you describe the different ways customers find out about this program?

- What are the marketing channels for each program component?
  - (bill inserts, TV, newspaper, radio, community events?)
- How often does each activity occur?
- Who is in charge of developing materials?
- Who is in charge of marketing activities?
- Is there a marketing plan or marketing log that you could provide to me?

How are marketing and outreach going so far? Have things been going as planned?

- If interviewee reports any challenges, clarify nature of the challenges (not adhering to deadlines, quality not as expected), then ask:
  - What effect is this having on implementation?
  - What is being done about that? Do you think that will fix things?
- How effective do you feel these marketing efforts have been in getting customers involved in the program, both in general and for specific individual marketing channels (e.g. bill inserts vs. TV).
- Which strategies have worked well? Which ones have not worked as well as you expected?

Are you able to send to me copies of the marketing materials that have been developed for this program?

Implementation Contractors

Please describe the role of implementation contractors in this program.

- APT/EFI
- What are their responsibilities?
- Satisfied with Trade Ally participation?

Can you just generally describe the lines of coordination and communication between various departments at AEP and the implementation contractors? Who talks to whom, how often, what about, and how?

- Do you feel that roles and responsibilities are clearly defined?

How is that going in general? Do you feel like you're being consulted as necessary and kept informed of activities?

- [If interviewee reports any challenges, clarify nature, then ask:]
  - What effects, if any, is this having on program progress?
  - What is being done about that? Do you think that will fix things?
  - Is there anything else you might do to make communication and coordination as good as possible?

Is there a clearly-defined process for resolving any issues that might arise with the implementation contractors?

Retailers

How do retailers get involved with this program?

- How do they learn about the program?
- What are their motivations for getting involved?

Please describe the role of retailers in this program.

- What are their responsibilities?
- Are you satisfied with Retailer participation in terms of numbers? In terms of level of participation/enthusiasm for the program?
- What are retailers' concerns with the program?

Can you generally describe the lines of coordination and communication between various departments at AEP and the retailers? Who talks to whom, how often, what about, and how?

How is that going in general? Do you feel like you're being consulted as necessary and kept informed of activities?

- If interviewee reports any challenges, clarify nature, then ask:
  - What effects, if any, is this having on program progress?
  - What is being done about that? Do you think that will fix things?
  - Is there anything else you might do to make communication and coordination as good as possible?
  - Do you feel like you have the information you need to determine whether AEP is on target to meet its goals with respect to components involving retailers?

Is there a clearly-defined process for resolving any issues that might arise with the retailers?

Incentives?

What are the incentive levels?

- Do you feel these are adequate to motivate customer participation?

What is the range (low end & high end) of days it takes from [a manufacturer agreement/receipt of coupons from the retailer/other triggering event] to when the incentive is placed into the mail? On average, how many days?

- Have you received any feedback from retailers/manufacturers about the number of days it takes for them to receive the incentive?
- Probe what they consider "timely" and for tracking of lag times.
- Do you have a requirement for the number of days it takes to mail out a payment?
  - If so, do you review this on a regular basis?

Program Tracking/Reporting

How is program participation tracked?

- Who tracks this info?
- What information is tracked?
- When is the information entered?

What types of reports (a.k.a., dashboard reports/management reports) do you rely upon to fulfill your responsibilities?

- Are you able to ascertain AEP's status on meeting goals in the Efficient Products program using the data in this report?
- If you were not meeting the targets, do the reports provide information that might help you ascertain where potential problem areas might be?
- Is there information/data that you would like to see added to these reports?

Are these reports accurate and current?

- How often is info updated?
- How often do you receive updated reports?
- How confident do you feel in the accuracy of the database being used to track this data?

What quality control processes are in place to ensure the program tracking database is accurate?

- Please explain.

Internal Organization/Staffing

What other departments at AEP are involved in the back-office functions or delivery of program services?

- Account Managers?
- Customer Service Reps?
- Coupon Processing?
- Payment Processing to Retailers?
- Manage Data? / Tracking Targets?

From your perspective is the staffing adequate for this program to meet its goal?

- (If not adequate) What areas/functions do feel are not adequately staffed?

If you had to ramp up this program, what would you differently with respect to internal organization and staffing level?

Looking Forward

Do you believe this program is on track to meet participation and savings goals?

- Why/why not?

Are or were there any changes being considered?

- If so, why?
- If changes were considered, but not implemented, what were they and why were changes not made?
- Which aspects of program are changing?

When is the appliance component of the program expected to roll out?

- What is the progress on this aspect of the program?
- Any challenges with getting this going?

Program Strengths/Areas for Improvement

What would you say is working really well?

What would you most like to change?

Is there anything that seems to stand in the way of making those changes at this time?

Summary

It's important for us to review what he heard you say in terms of key obstacles and issues you believe exist with this program. [Summarize of key issues and observations].

- I heard you talk about X challenges to the programs [list the challenges reported]. Could you give a percentage to each of these that add up to 100% in terms of how detrimental they are to achieving the goals for the Efficient Products program?

Do you have anything to add? Is there anything I've forgotten to ask you about?

Finally, how do you feel you will benefit from our research, and what would you expect to see come out of this research to be truly valuable to you and your team?

Retailer Interview Guide

6.1.3 Retailer Interview Guide: Efficient Products

Interview Objectives:

- Assess the experience and satisfaction of AEP Ohio retailers participating in the program.
- Determine effectiveness of marketing activities/collateral from the retailer perspective.
- Determine effectiveness /efficiency of program design from the retailer perspective.

Introduction

May I speak with the manager of the store, or lighting department?

[IF MANAGER IS UNAVAILABLE DETERMINE BEST TIME TO CALL

BACK.]

Lead in for respondent:

Hello my name is _____ from Energy Market Innovations. I am calling on behalf of AEP Ohio, as part of an evaluation of their energy efficiency programs. We are speaking with participating retailers to understand their experience with AEP Ohio's Efficient Products

CFL discount program so we can help improve the program. Is this a good time for us to talk? The interview will take about 15 minutes of your time, your views are very important for the future of these types of programs. [If NO, schedule time to call back.]

Our records indicate that your store located at [store address] participated in the Efficient Products CFL discount program. Are you familiar with this program? [If NO or DK, describe the program. If still not familiar, ask if there is someone else in the store who might be familiar with this program.]

Before we get started, can you take a moment and explain your role and scope of responsibilities at [store name]. How long have you held this position?

Retailer Participation

How long has the store located at [store address] participated in AEP Ohio's CFL discount program?

In what capacity has the store participated? (e.g., stock many types of discounted bulbs, or only one type? Sold many discounted bulbs?)

How did you first learn about this program?

- From a manufacturer? AEP? Or some other source?
- Did the store initiate contact? Or did someone approach the store?

Did you have any initial concerns about participating in the program?

- IF YES: What concerns did you have about participating in the program?
- Were your concerns addressed or resolved in some way?
    - IF NO: What could AEP do to help resolve those concerns?
    - IF YES: How so?

Why did your store decide to participate in the program?

- If you had to make a guess, why do you think some retailers might choose not to participate in this program?

Marketing

Are you using promotional materials provided by AEP Ohio (or APT)?

- How are the discounted CFLs promoted in the store?
    - Signage, coupons next to the product?
- How effective are the promotional materials provided by AEP Ohio (or APT/EFI)?
    - Do you have suggestions for making these materials more effective?
- If NO AEP Ohio (or APT) promotional materials are being used: Why aren't you using the promotional materials?

Has your store created its own materials to promote the program's discounted CFLs?

- (e.g., in-store signage, circular ads, signage outside the store?)
- Please describe.
- Are you able to send to me copies of the marketing materials that your store has developed for this program?

Does your store use any materials from the manufacturer or any other source to promote the program's discounted CFLs?

- Please describe.

Sales

To what extent has this program influenced your store's CFL stocking practices?

- Did you stock Energy Star qualified CFLs before this program began?
  - If yes, are you keeping more stock on hand as a result of the program?
- Has the amount of shelf space devoted to CFLs increased, compared to other types of lamps?
- Have you made any changes to the placement or location of CFLs in your store since participating in the program?

What impact has the program had on sales of CFLs at your store?

- Is this assessment based on a guess or from sales data/store reports?)

What do you believe are the most important reasons customers purchase CFLs through the discount program?

- What sort of changes would you make to the program that would increase CFL sales?

What do you think has the greatest impact on sales?

Are there any barriers or challenges that have inhibited or prevented customers from participating in the discounted CFL program?

- Please explain.

Retailer Staff Training

Did any staff at your store receive training to support participation in AEP Ohio's Efficient Products CFL discount program?

- How many employees received training?
- What types of employees received training?

[If Yes:] How satisfied were you with the quality of the training?

- Was there any information you would recommend adding to the training?

Interface/Communication with AEP Program Staff

Can you just generally describe the lines of coordination and communication with AEP Ohio? Who talks to whom, how often, what about, and how?

How is that going in general? Do you feel that you're being consulted as necessary and kept informed of activities?

Interface/Communication with Implementation Contractors

Can you generally describe the lines of coordination and communication with the implementation contractors, APT and EFI? Who talks to whom, how often, what about, and how?

How is that going in general? Do you feel that you're being consulted as necessary and kept informed of activities?

Incentives/Coupon Processing

The information I have in front of me shows that your store sells the discounted CFLs using the [instant markdown/in-store coupons]. Is this correct?

[If coupons:]

Can you describe how the coupons are processed?

- Are you satisfied with this process?
- Is reimbursement from AEP Ohio received in a timely manner?
    - Probe what they consider "timely."

[If instant markdowns:]

Can you describe how you get reimbursement from AEP Ohio for the markdowns?

- Are you satisfied with this process?
- Is reimbursement from AEP Ohio received in a timely manner?
    - Probe what they consider "timely."

Program Tracking

Does your store regularly track the information regarding discounted CFL purchases?

- How tracked? How often reported?
- Any challenges with this?

How does info get to AEP?

- Any challenges with this?

Satisfaction

Have you received any customer comments or complaints about the CFLs sold through the program?

- What were those comments or complaints?

From your perspective, can you comment on the quality of products offered through the CFL discount program?

Have you had any difficulty obtaining adequate stock of any of the bulbs you have carried though this program?

Thinking about everything we have talked about, what would you say are the best aspects of this program?

Is there anything AEP Ohio can do to improve this program?

Overall, how satisfied are you with AEP Ohio's CFL program? Would you say you were...

1. Very Satisfied
2. Somewhat SATISFIED
3. Neither satisfied nor dissatisfied
4. Somewhat DISSATISFIED
5. VERY DISSATISFIED

98. Don't Know

- Please explain why you gave that rating.

Will you continue to work with this program?

Impact Questions

Verify quantity sold by category (wattage, size, etc) with retailers?

Firmographics

Can you please estimate the total INDOOR square footage of your facility at this location?

Approximately how many employees does your store have at this location?

Summary

It's important for us to review what he heard you say in terms of key obstacles and issues you believe exist with this program. [Summary of key issues and observations].

- I heard you talk about X challenges to the programs [list the challenges reported]. Could you give a percentage to each of these that add up to 100% in terms of how detrimental they are to achieving the goals for the Efficient Products program?

Do you have anything else about the program that we didn't discuss that you would like to make sure I know about?

Finally, how do you feel you will benefit from our research, and what would you expect to see come out of this research to be truly valuable to you and your team?

C

NAVIGANT
CONSULTING

AEP Ohio
Energy Efficiency/ Demand Response Plan
Plan Year 1 (1/1/2009-12/31/2009)
Program Year Evaluation Report: Appliance Recycling Program

Presented to

AEP Ohio

March 9, 2010

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Table of Contents

Section 1. Executive Summary

1.1 *Evaluation Objectives*

The Appliance Recycling program provides AEP Ohio customers with a financial incentive to remove spare refrigerators and freezers from operation as secondary units. Through the program, units are removed to a collection facility and disassembled for environmentally responsible disposal and recycling. The program also prevents existing primary refrigerators and freezers from being retained and used as secondary units after customers purchase new units. AEP launched this program in mid-year 2009 in both the Ohio Power Company (OPCo) and the Columbus Southern Power (CSP) service areas. The implementation contractor for this program is JACO Environmental Inc. (JACO).

This report summarizes the findings and results from the impact and process evaluations of Program Year 2009 (PY 2009) of AEP Ohio's Residential Appliance Recycling (AR) program. The objectives of the evaluation are: (1) to quantify energy and peak demand savings impacts as a result of the program during PY 2009, and (2) to determine key process-related program strengths and weaknesses and provide recommendations to improve the program.

1.2 *Evaluation Methods*

Energy savings for the Appliance Recycling program were estimated using two analysis approaches. The first approach utilized deemed energy and demand savings assumptions from the AEP Ohio 2009 to 2011 Energy Efficiency / Peak Demand Reduction (EE / PDR) Action Plan (herein referred to as the "Program Plan"). For the second approach, the evaluation team used regression equations to estimate refrigerator and freezer unit energy consumption (UEC) in kWh that are based on a large database of over 1,600 previously metered units in California utilizing a DOE lab metering approach. The regression equations estimate usage as a function of unit characteristics including age, size, configuration, defrost mode, and label amps. The characteristics of units collected by JACO for AEP Ohio were applied to the regression model to estimate full-year UECs (representing kWh savings) that are specific to AEP Ohio's program.

Table 1.1 summarizes the key data collection activities in support of this evaluation which included phone surveys with program participants, in-depth interviews with program staff, and data from tracking appliance collection activities.

Phone surveys with participants were used to gather data for the impact analysis as well as gauge satisfaction with the program overall and with specific elements. Participants were asked questions about the age of the recycled appliance, what the participant would have done with the appliance if the program did not exist, how and where the appliance had been used, and whether the appliance was replaced by another appliance. The data from these types of questions was used in the impact analysis portion of the evaluation. Participants were also asked to rate their experiences with the program on a scale of 0 to 10 with respect to the following program components: sign-up process, collection of the appliance, payment, and the

program overall. Participants also were asked questions about aspects of the program that received lower (dissatisfied) ratings.

In-depth interviews with staff at AEP Ohio and JACO (implementation contractor) provided the evaluation team insights into program operations from the perspective of its administrators. These interviews were instrumental in enabling the evaluation team to assess challenges and opportunities AEP Ohio and JACO face while administering the program.

Finally, tracking data provides a census of all appliances recycled through the program. This tracking data was used in the impact analysis conducted.

Table 1.1. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Target	Sample Size	Timing
Tracking Data Analysis	All Program Participants	Tracking Database	-	-	Ongoing
In-depth Phone Interviews	AEP Ohio program manager	Contact from AEP Ohio	Program Mgr – Manager of Consumer Programs –	2	Feb. 18, 2010
	Program Implementer (JACO)	Contact from AEP Ohio	JACO program implementer –	1	Feb 9, 2010
Phone Surveys	All Program Participants	Tracking Database	Random Sample of Program Participants	102 Total 74 Refrig 28 Freezer	Feb 2010

1.3 *Key Findings*

Table 1.2 shows the AEP Ohio ex-ante estimates for the appliance recycling program. It should be noted that the ex-ante estimates show full year savings. Additionally, Table 1.3 shows the breakdown of units collected, as captured in JACO's tracking database.

Table 1.2. AEP Ohio Ex-Ante Savings Estimates

Impact Parameter	Total
Ohio Power Company Energy Savings – MWh (full-year)	2,870
Columbus Southern Power Energy Savings – MWh (full-year)	3,436
Program Energy Savings – MWh (full-year)	**6,306**
Ohio Power Company Demand Savings – MW	0.302
Columbus Southern Power Demand savings – MW	0.389
Program Demand Savings – MW	**0.691**

1 Values may not sum due to rounding

Table 1.3. Appliance Recycling Data

Program Breakdown – Units Recycled	Refrigerator	Freezer	Total
Ohio Power Company	1,513	618	2,131
Columbus Southern Power	2,074	676	2,750
AEP Ohio Total	3,587	1,294	4,881

The following tables show the results of the impact evaluation as determined by the two analysis approaches. Table 1.4 and Table 1.5 provide the first-year, PY 2009, evaluation-adjusted savings estimates for each measure, for each utility, and for the program overall. These savings estimates are based on electricity savings at the customer meter.

The savings estimates calculated by the two analyses approaches are also adjusted to reflect both part-use and part-year operating characteristics.

The part-use factor accounts for average operating characteristics determined from the telephone survey of 100 program participants, including the average number of months that participants run their appliances.

The part-year factor accounts for the savings that can be attributed to the program for PY 2009 based on the time when the appliance was recycled. For example, if the appliance was recycled in December of 2009, the last month of the program year, then only the savings accumulated for the month of December (i.e., 1/12 of the full-year savings) apply to the program.

Table 1.4. PY 2009 Impact Parameter and Savings Estimates – Program Plan Savings Estimates

Parameter and Impact Estimates[1]	Refrigerator	Freezer	Total
Energy Savings			
Average Annual per Unit – kWh (full-year) [A]	1,112	995	-
Ohio Power Company – MWh (full-year) [B]	1,682	615	2,297
Columbus Southern Power – MWh (full-year) [C]	2,306	672	2,979
Total Program – MWh (full-year) [D = B + C]	**3,989**	**1,287**	**5,276**
Part-Use Factor [E]	81%	79%	
Average Annual per Unit – kWh (part-use) [F = A x E]	902	850	-
Ohio Power Company – MWh (part-use) [G = B x E]	1,365	525	1,890
Columbus Southern Power – MWh (part-use) [H = C x E]	1,871	574	2,445
Total Program – MWh (part-use adjusted) [I = D x E]	**3,235**	**1,010**	**4,335**
Part-Year Factor[2] [J]	43%	41%	
Average Annual per Unit – kWh (part-year) [K = F x J]	463	414	-
Ohio Power Company – MWh (part-year) [L = G x J]	701	256	957
Columbus Southern Power – MWh (part-year) [M = H x J]	961	280	1,241
Total Program – MWh (part-year adjusted) [N = I x J]	**1,662**	**536**	**2,198**
Demand Reduction			
Average per Unit – MW [O]	0.143	0.128	-
Ohio Power – MW [P]	0.203	0.074	0.277
Columbus Southern Power – MW [Q]	0.278	0.081	0.359
Total Program – MW [R = P + Q]	**0.481**	**0.155**	**0.636**

1 Values may not sum due to rounding

2. The average part-year factor is adjusted to reflect a whole-month basis (i.e., 0.37 to 0.42, or 4.4 months to 5 months)s

Table 1.5. PY 2009 Impact Parameter and Savings Estimates – Regression-based Savings Estimates

Parameter and Impact Estimates	[illegible]	[illegible]	[illegible]
Energy Savings			
Average Annual per Unit – kWh (full-year) [A]	1,995	1,714	
Ohio Power Company – MWh (full-year) [B]	2,867	1,054	3,921
Columbus Southern Power – MWh (full-year) [C]	4,290	1,164	5,455
Total Program – MWh (full-year) [D = B + C]	**7,157**	**2,218**	**9,376**
Part-Use Factor [E]	[illegible]	[illegible]	[illegible]
Average Annual per Unit – kWh (part-use) [F = A x E]	1,619	1,464	-
Ohio Power Company – MWh (part-use) [G = B x E]	2,326	900	3,226
Columbus Southern Power – MWh (part-use) [H = C x E]	3,480	995	4,475
Total Program – MWh (part-use adjusted) [I = D x E]	**5,806**	**1,895**	**7,701**
Part-Year Factor [J]	[illegible]	[illegible]	[illegible]
Average Annual per Unit – kWh (part-year) [K = F x J]	711	642	
Ohio Power Company – MWh (part-year) [L = G x J]	1,008	386	1,394
Columbus Southern Power – MWh (part-year) [M = H x J]	1,542	446	1,988
Total Program – MWh (part-year adjusted) [N = I x J]	**2,550**	**831**	**3,382**

1 Values may not sum due to rounding

2. Part-year factors are determined on a whole-month basis while the resulting average of all records is presented here.

1.3.1 Key Impact Findings

The PY 2009 energy savings goal for the Appliance Recycling program was 4,665 MWh with 4,669 refrigerators and freezers recycled. For Ohio Power Company, the goal was 2,286 MWh with 2,088 refrigerators and freezers recycled. For Columbus Southern Power, the goal was 2,379 MWh with 2,581 refrigerators and freezers recycled. Additionally, the PY 2009 ex-ante energy savings are 6,306 MWh and ex-ante demand reduction is 0.691 MW. For Ohio Power, the ex-ante was 2,870 MWh in energy savings and 0.302 MW of demand reduction. For Columbus Southern Power, the ex-ante was 3,436 MWh in energy savings and 0.389 MW of demand savings. The ex-ante savings are based on full-year energy savings.

The reported number of units recycled was 4,891. The full-year energy savings, as reported using the program plan assumptions, was 5,276 MWh. This results in a realization rate of 84%, overall (and 80% for OPCo and 87% for CSP). When accounting for the part-use factor, the resulting total savings are 4,335 MWh. Additionally, when accounting for the average part-year factor, the total savings are 2,198 MWh.

The full-year energy savings, as determined by the regression-based analysis methodology, was greater, at 9,376 MWh. This results in a realization rate of 149%, overall (with 137% for OPCo and 159% for CSP). When accounting for the part-use factor, the savings are 7,701 MWh. Additionally, when accounting for the part-year factor calculated for each record, the savings are 3,382 MWh. For PY 2009, the demand reduced is based on the program plan assumptions for per-unit demand reduction for refrigerators and freezers. The total demand reduced was 0.636 MW. This results in a realization rate of 92%, overall (with 92% for OPCo and 92% for CSP).

The savings values adjusted by the part-year factor are significantly lower than the program goal savings and the ex-ante savings. These results occurred because, on average, only five months of the whole year's savings could be attributed to the program. According to the tracking data, on average, appliances were picked up for recycling during the month of August. Therefore, no savings occurred from January to July of 2009.

Conversely, the regression-based analysis calculated total savings to be significantly higher than that specified by the program plan, the program goals, and the ex-ante savings. This result reflects the fact that the program collected more units that were older than anticipated in PY 2009. Fully 26% of refrigerators and 44% of the freezers picked up by the program were over 30 years old, while 36% of each were between 21 and 30 years old. About 84% of refrigerators and nearly all (92%) of the freezers collected by the program were manufactured before the 1993 change in appliance standards. The appliance standards change resulted in a dramatic improvement in efficiency. Pre-1993 units are generally considered "energy hogs" that use three to four times the energy of units made since the appliance standards change.[1] Since the regression approach uses savings estimates for each unit recycled that are more closely matched to the characteristics of the actual recycled appliances, the regression-based savings estimates should be the most accurate.

[1] The standards change resulted in a dramatic improvement in energy efficiency of appliances. Pre-1993 units are generally considered "energy hogs" that use three to four times the energy of units manufactured since the standards change.

The results of the analysis verified the performance of the Appliance Recycling program with respect to the total energy savings and demand reduction ex-ante estimates.

Table 1.6. PY 2009 Program Specified Goals vs. Reported Savings

Impact Parameter and Savings Estimates	Program Goal	Total Program Savings (Program Plan)			Program Savings (Regression-based Approach)		
		Full-Year	Part-Use	Part-Year	Full-Year	Part-Use	Part-Year
Total units recycled	4,669	4,881	4,881	4,881	4,881	4,881	4,881
Energy Savings (MWh)	4,665	5,276	4,335	2,198	9,376	7,701	3,382

Table 1.7. Savings Breakdown by Utility (Full-year Energy Savings)

Utility	Total Units	Energy Saving			Peak Demand Reduction			Approach
		Ex-Ante MWh	Ex-Post MWh	Realization Rate	Ex-Ante MW	Ex-Post MW	Realization Rate	
OPCo	2,131	2,8708	2,297	80%	0.302	0.277	92%	Program Plan
			3,921	137%		-	-	Regression-based
CSP	2,750	3,436	2,979	87%	0.389	0.359	92%	Program Plan
			5,455	159%		-	-	Regression-based
Total	4,881	**6,306**	**5,2768**	**84%**	**0.691**	**0.636**	**92%**	Program Plan
			9,376	**149%**		**-**	**-**	Regression-based

1.3.2 Key Process Findings

Aside from the number of units to be recycled, there were few goals to be referenced in the process evaluation. Explicit expectations with respect to customer satisfaction, expected turn-around times for check processing and appliance collection, number of times participants had to contact JACO with questions, number of drop-outs, program awareness, and participation rates among those aware of the program would all be useful metrics, both for setting expectations with subcontractors, as well as evaluating how the program could be improved. Therefore, this evaluation will speak in terms of broad trends found in the data, but without specific (non-impact) goals to compare these metrics against, as it is difficult to ascertain which parts of the program were successful and which were less successful.

Customer satisfaction was high. Overall, 97% of participants were satisfied with their experience with the program, with 65% saying they were "very satisfied."

Based on participant surveys, program operations are running smoothly. According to participants, the majority of appliances were picked up within two weeks from the time customers contacted the program implementer. Participants also commented that the enrollment process is simple, and that they are happy with the enrollment process, scheduling, and the collection of appliances.

The rebate is of secondary concern for program participants. The majority of participants wanted to avoid the hassle of disposing of the appliances themselves.

Tracking database had missing data. There are a few minor issues with accuracy and completeness of the tracking database.

There is a lack of specificity around goals outside of units collected. Some indicators of how the program is running that are not being collected include customer satisfaction, turnaround time between appliance collection and receipt of rebate check, and program awareness among AEP Ohio customers.

Data on program drop-outs is not being reported. While participant satisfaction with the program is high, it is difficult to know how many participants have dropped out due to low levels of satisfaction, finding difficult times to schedule appliance collection, or too much time lapsing between time of appointment and collection.

Section 2. Introduction to the Program

This evaluation report covers the Appliance Recycling program element of the AEP Ohio gridSMART consumer energy efficiency and peak demand reduction programs.

2.1 *Program Description*

The Appliance Recycling program is designed to achieve long-term energy savings through the retirement and recycling of spare or secondary refrigerators and freezers (though primary appliances also can be recycled) in AEP Ohio's Columbus Southern and Ohio Power Company service territories. The program provides incentives and strives to reduce barriers that current appliance owners face that prevent them from retiring these appliances. The program also works to prevent existing primary refrigerators and freezers from being retained and used as secondary units after customers purchase new units.

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

The Appliance Recycling program began operation in May of 2009. The program offers free pick-up and recycling services for secondary or spare working refrigerators and freezers, but will also take appliances being used as primary refrigerators or freezers. Program savings are based on the accelerated removal, dismantling and recycling of older, inefficient units. In exchange for participating in the program, AEP Ohio pays participants $25 each for up to two each of recycled refrigerators and freezers, for a maximum of four recycled appliances.

The implementation contractor for this program is JACO Environmental Inc. (JACO). JACO is responsible for program general management, customer service, unit warehousing and recycling processing, incentive fulfillment, data reporting, and quality assurance. JACO has hired three subcontractors to help with marketing and public relations, hazardous materials handling, and appliance collection and transportation services.

The program is marketed through a combination of methods; bill inserts, press releases, radio and TV spots, newspaper ads, and word-of-mouth.

According to program records, the program picked up and recycled a total of 4,881 units during PY 2009. About 74% of these units were refrigerators and 27% were stand-alone freezers. Table 2.1 provides the breakdown of recycled units by measure type.

Table 2.1. Summary of Recycled Units by Utility and Appliance Type

Utility	Measure Type	Number of Units	Percent of Units
Ohio Power	Refrigerators	1,513	31%
	Freezers	618	13%
Columbus Southern Company	Refrigerators	2,074	42%
	Freezers	676	14%
AEP Ohio Total	-	**4,881**	**100%**

Section 3. Evaluation Methods

This section discusses the questions the evaluation sought to answer, the methods, sample design, and data sources used to answer those questions.

3.1 Evaluation Questions

The evaluation sought to answer the following key researchable questions:

3.1.1 Impact Questions

1. What are the impacts from this program?
2. Did the program meet its energy and demand goals? If not, why not?

3.1.2 Process Questions

1. Has the program delivery diverged from the plan filed? If yes, how so and why?
2. What are key barriers to participation in the program for eligible AEP Ohio customers? How can they be addressed by the program?
3. How do customers become aware of the program? What marketing strategies could be used to boost program awareness?
4. Is the program outreach to customers effective in increasing awareness of the program opportunities?
    a. What is the format of the outreach?
    b. How often does the outreach occur?
    c. Are the messages within the outreach clear and actionable?
5. Are program incentive levels appropriate to encourage participation?
    a. What is the influence of the incentive level versus the marketing effort on program participation levels?
    b. How should the budget allocation between incentive spending and marketing spending be adjusted to maximize participation?

The full list of research questions can be found in the Appliance Recycling Evaluation Plan.

3.2 *Analytical Methods*

3.2.1 Program Savings

Program impacts were calculated using two different approaches based on: 1) the AEP Ohio Program Plan and 2) a Regression Analysis. Under the first approach, impacts were computed using the deemed savings values specified by the AEP Ohio Program Plan. Under the second approach, energy savings and peak demand reduction were estimated using a regression-based econometric approach based on the specific characteristics of the units collected through the program. The coefficients of the regression equation were developed previously from a large database of over 1,600 previously metered units in California utilizing a DOE lab metering approach. The regression approach is intended to provide additional planning information to AEP Ohio.

AEP Ohio Program Plan Assumptions Approach

To estimate energy savings under the first approach, the deemed kWh and kW impacts per unit specified in the AEP Ohio Program Plan is applied to the number of units collected and recycled by the program during the first program year. The general form of the equation for the refrigerator and freezer retirement savings algorithm is:

$$Total\ Savings = (Number\ of\ Units) \times (Savings\ per\ Unit)$$

The data source for this calculation is program-level tracking data provided by JACO. Impacts per unit are calculated using the following equations.

Table 3.1. AEP Program Plan Variables and Terms

Component Description	Equation or Description
Electricity Impact (kWh)	$ESav_{RetFridge}$
Demand Impact (kW)	$DSav_{RetFridge}$
Electricity Impact (kWh)	$ESav_{RetFreezer}$
Demand Impact (kW)	$DSav_{RetFreezer}$
$ESav_{RetFridge}$	Annual energy savings per retired refrigerator
$DSav_{RetFridge}$	Summer demand reduction per retired refrigerator
$ESav_{RetFreezer}$	Annual energy savings per retired freezer
$DSav_{RetFreezer}$	Summer demand reduction per retired freezer

The deemed kWh and kW savings per unit are described in Table 3.2. These adjustments were made when calculating overall savings values.

Table 3.2. AEP Program Plan Deemed Per-Unit Impact Values

Component	Type	Value
$ESav_{RetFridge}$	Fixed	1,111.95 kWh
$DSav_{RetFridge}$	Fixed	0.1341 kW
$ESav_{RetFreezer}$	Fixed	994.75 kWh
$DSav_{RetFreezer}$	Fixed	0.1200 kW

Regression-Based Approach

Impacts for the program are also calculated using a regression analysis model. Energy savings for refrigerators and freezers are expressed in terms of Full-year Unit Energy Consumption

(UECs). UEC estimates were made using a regression-based approach that models full-year energy savings as a function of unit age, size, configuration, defrost mode, and label amps. These regression equations and coefficients are based on a large body of impact evaluation work that was previously completed in California, which rely on DOE lab metered results for over 1,600 units. The regression equations developed from California study were then applied to the characteristics of the population of units actually collected by JACO in the AEP Ohio service area. Savings estimates found by the regression-based UECs were then adjusted for part-use operating characteristics. The UEC estimates assume the same operating characteristics throughout the year. However, findings from the phone survey of program participants determined a part-use factor to account for appliances that may have been turned off during portions of the year (e.g., appliances may have been turned off during the winter months or used only for special occasions).

The regression equation and coefficients used to estimate the UECs for recycled refrigerators and freezers are shown below in Table 3.3. This equation is from the recently completed evaluation of California's 2004-05 Appliance Recycling programs, and is based on a large database of over 1,600 previously metered units in California based on the DOE lab metering approach.[2] The regression equation estimates usage as a function of unit characteristics (age, size, configuration, defrost mode, and label amps). All of the required data inputs to this equation were obtained from the Appliance Recycling program tracking data.

[2] Evaluation Study of the 2004-05 Statewide Residential Appliance Recycling Program, Final Report. April 2008. ADM Associates, Inc.

Table 3.3. Regression Model and Coefficients of DOE Annual UEC for Recycled Appliances

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

These estimates reflect the full-year energy consumption (using the AEP Ohio Program Plan approach) and the UEC (using the regression-based approach) where the operating characteristics of the appliances are assumed to be constant for the entire year.

Part-Use Adjustment. The part-use factor is used to adjust the full-year annualized UEC estimates to reflect the number of months the recycled unit would have been operated absent the program. This adjustment is based on self-reported findings from the completion of 102 telephone surveys of program participants. Survey respondents reported the number of months over the year that the appliance would have been operating in the absence of the program (i.e., if the appliance had not been removed). This element of the calculation is particularly important for AEP Ohio's program, since refrigerators and freezers located in garages may have been shut down during the winter months, when cold weather reduces or eliminates the need to run the unit. Separate average part-use factors were developed for both refrigerators and freezers.

Part-Year Adjustment. The part-year factor is used to adjust the full-year estimates to reflect the time of year the measure was implemented. That is, the time when the appliance was picked up for recycling and savings began to accrue. Savings from appliance recycling apply only when an appliance was actually removed by the program implementer, JACO. For example, if an appliance was not removed until November of 2009, savings from January to October (as calculated by the two analyses methods) would not apply to the program. The part-year factor adjusted the full-year savings to reflect savings only during the months of November and December. Appliance pick up dates were available for each appliance in the program tracking data, and individual part-year adjustments were made for each appliance record. An average part-year adjustment factor was calculated for the first analysis method based on AEP Ohio Program Plan assumptions.

3.3 *Data Sources*

The key data sources for this evaluation were phone surveys with program participants, in-depth interviews with program staff, and data from tracking appliance collection activities.

Table 3.4. Data Collection Activities

Data Collection Type	Targeted Population	Sample Frame	Sample Target	Sample Size	Timing
Tracking Data Analysis	All Program Participants	Tracking Database	-	-	Ongoing
In-depth Phone Interviews	AEP Ohio program manager	Contact from AEP Ohio	Program Mgr, Manager of Consumer Pgms	2	February 16, 2010
	Program Implementer (JACO)	Contact from AEP Ohio	JACO program implementer	1	February 9, 2010
Phone Surveys	All Program Participants	Tracking Database	Random Sample of Program Participants	102 Total 74 Refrig 28 Freezer	February 2010

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

Impact Evaluation

- **Estimation of savings and Full-year Unit Energy Consumption (UECs).** All of the required data inputs to the AEP Ohio Program Plan savings approach and the regression equation used to develop final estimates of unit energy consumption for refrigerators and freezers were obtained from the program tracking database and the assumptions specified in the AEP Program Plan. The phone survey also obtained several of these same characteristics. However, because they were based on self-reported information, rather than the results of a visual inspection of the units picked up by the program, they were deemed less reliable than the tracking data, which was ultimately used for the calculations.

- **Estimation of the Part-use factor.** Self-reported findings from the telephone survey were the sole data source for the part-use factor.

- **Part-year factor.** The program tracking database provided the appliance pick up dates so that part-year factors could be calculated. Individual part-year factors were determined and applied to the regression-based analysis approach while the average part-year factor was calculated and applied to the AEP Ohio Program Plan assumption approach.

Process Evaluation

The process evaluation relied primarily on two data sources, program staff interviews, and telephone surveys of program participants.

- **Program Staff interviews.** The interview with the Appliance Recycling Program Manager focused on program processes in order to better understand the goals of the program, how the program was implemented, the perceived effectiveness of the program, and also verified evaluation priorities. The interviews with the JACO managers focused on the recycling process and the details of the appliance pickup.
- **Telephone surveys.** The process evaluation component of the surveys obtained information on sources of program awareness, program satisfaction, rebate satisfaction, and awareness of program features (e.g., rebates, technical assistance, marketing materials).

3.4 *Population and Sampling*

The sample of Appliance Recycling participants was randomly selected from the Program Tracking Database provided by AEP Ohio. Basic data cleaning steps were undertaken before the sample was pulled from the database so that for example, records with missing or invalid phone numbers were removed. These records could not be included in the surveying efforts but were included in the final impact results. The sample was stratified by appliance type and quotas were set based on the proportion of each recycled appliance in the general population. Therefore, no weights are necessary for the data analysis. In total, 4,265 pieces of sample were sent to DataPrompt International (DPI) to administer the survey.[3] DPI was instructed to randomly select and dial participants until they had reached the following quotas – 74 refrigerator recyclers and 28 freezer recyclers, for a total of 102 completed surveys.

3.5 *Sampling Error*

The following table shows the sampling error associated with the participant survey. The sampling error is a quantitative measure of how well the sample represents the entire population of participants.

[3] Overall, there were 4,476 unique participants. However, 211 of these participants recycled one or more each of refrigerators and freezers. To test for differences across appliance recycling experiences, these 211 unique participants were excluded from the sample frame.

Table 3.5. PY 2009 Sample Size and Population-Level Sampling Error

Population	[illegible]	[illegible]	[illegible]
Participants recycling refrigerators only	3,218	74	9.5%
Participants recycling freezers only	1,047	28	11.5%
Total	**4,265**	**102**	**8.0%**

Table 3.6 shows the final dispositions for the 491 program participants who were contacted at least once to complete the participant phone survey. As shown, the evaluation team completed interviews with 102 participants, reflecting an overall response rate of 21%. The survey team was unable to reach 56% for a variety of reasons, including no one answering, an answering machine, or a busy signal. Another 11% requested to be called back later to complete the survey but did not end up doing so.[4] There were problems with the phone number, such as a disconnected number, for 2%. Only 9% of participants who answered refused to participate in the survey.

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

Table 3.6. Participant Survey Sample Disposition

Contact Disposition	Count	Percent
Completes	**102**	**21%**
Unable to Reach	274	56%
Non-Specific Callback/Appointment Scheduled	54	11%
Refusal	45	9%
Phone Number Issue	9	2%
Quota on refrigerator met	5	1%
Appliance not picked up	1	0%
Respondent unaware of appliance details	1	0%
Electric company not AEP Ohio	0	0%
Language Barrier	0	0%
Total Participants Attempted to Contact	**491**	**100%**

As outlined in Table 3.6, interviews were attempted with 137 participants with 120 completed surveys. The remaining 35 did not complete full surveys for several reasons, including the quota was filled on refrigerators (n=5), participants terminated mid-interview (n=28), one participant was incorrectly opted out of the interview due to a CATI program screening limitation[5], and another said he or she was unaware of the recycling of a refrigerator or freezer.

[5] CATI programming did not allow for one response from a participant who was asked the screening question "did you have a refrigerator picked up" to allow for this respondent's "no, I had a refrigerator *and* a freezer picked up." The participant was not interviewed past this screening question.

Table 3.7. Participant Survey Contacts Disposition

Survey Contacts Disposition	Customers	Percent
Customers Surveyed	137	100%
Completed Interview	102	75%
Appliance not picked up	1	1%
Electric company	0	0%
Quota on refrigerator met	5	4%
Respondent unaware of appliance details	1	1%
Mid-Interview Terminate	28	20%

Table 4.2. Quantity of Appliances Turned In by Each Participant

Refrigerator	Freezer	[illegible]	[illegible]
1	0	1	3,064
0	1	1	1,014
2	0	2	152
1	1	2	207
0	2	2	33
3	0	3	2
2	1	3	1
1	2	3	2
2	2	4	1

Based on program tracking data, there were 4,476 unique participants who had one or more appliances picked up by JACO. The majority of participants recycled one appliance, with 3,064 recycling one refrigerator and 1,014 recycling one freezer. Approximately nine percent (398) of the participants recycled more than one appliance. Five participants recycled three appliances and one participant recycled four appliances. No participants recycled more than four appliances, according to the tracking data.

Missing Data Tracking System Data

The evaluation team conducted a review of the tracking data and documented problems and issues. All of the problems identified were generally associated with incomplete records for a number of tracked fields. Most fields were well-populated, particularly the most important fields for evaluation and the regression-based impacts determination (age, size, configuration, defrost mode, and label amps). However, some of the tracked fields were missing or the entry was designated "unknown" or "N/A." These fields included:

- *Unit configuration.* This refers to whether a refrigerator is a side-by-side unit, has a freezer at the top, or at the bottom, or has one door with a freezer inside. About 22 records (less than 1 percent), did not have this information specified. For missing data, the configuration was assumed to be the most common refrigerator or freezer type of the

entire database. The most common refrigerator type was "Top Freezer," and the most common freezer was "Single Door."

» *Label Amps.* This refers to the operating amps listed on the appliance. This information was missing for 178 records, approximately 3.5 percent of the total database. This information may have been missing because labels on older equipment may have been unreadable or missing after years of exposure to typical field conditions. For missing data, the average of label amps for the entire database was applied to these units. The average label amps is 5.5 amps.

» *Unit age.* Unit age refers to the time between dates of manufacture, as listed on the appliance, and time of pick up. Unit age was missing for two units and the average age of all units listed in the database was applied to these units. The average age of appliances is 27 years.

» *Unit size.* Unit size refers to the rated size, in cubic feet, of the refrigerator or freezer. Unit size was missing for two units and the average size of all units listed in the database was applied to these units. The average size of appliances is 17 cubic feet.

The evaluation was completed successfully without these incomplete data by using the replacement assumptions. The overall impact on the UEC estimate as a result of using these assumptions is small because the full data requirements were fulfilled for most of the records. The evaluation team recommends that the program tracking data receive periodic data quality reviews for data quality and completeness.

4.1.2 Program Impact Estimates

As described in Section 1, deemed kWh and kW savings per unit specified in the AEP Ohio Program Plan are applied to the number of units collected and recycled by the program during the first program year. Table 4.3 shows the results for PY 2009 gross impacts applying the AEP Ohio Program Plan approach. Savings estimates are made at the point of the customer meter and are not adjusted for part-use or part year.

Table 4.3. Estimated Impacts Using the AEP Program Plan Analysis Approach

	[illegible]	[illegible]
Number of Units	3,587	1,294
Unit Energy Savings (kWh)	1,112	995
Unit Demand Reduction (kW)	0.134	0.120
Total Energy Savings (MWh)	**3,989**	**1,287**
Total Demand Reduction (kW)	**481?**	**155**

Annualized Unit Energy Consumption (UECs)

For the second analysis approach, as described in Section 1, regression based Unit Energy Consumption (UEC) estimates were made for both refrigerators and freezers. The regression equation estimates annual usage as a function of unit characteristics (age, size, configuration, defrost mode, and label amps). All of the required data inputs to this equation were obtained from the program tracking data. When necessary, a number of assumptions were made for missing inputs for a handful of records.

Applying the regression coefficients developed through the California study of over 1,600 metered units to the full population of units collected through the AEP Ohio program during PY 2009 and their associated characteristics yielded the following UECs for each type of appliance. Table 4.4 shows the results of the regression analysis approach. These values are not adjusted for part-use.

Table 4.4. Estimated UEC Using Regression/UEC Analysis Approach

	[illegible]	[illegible]
Average UEC (kW)	1,995	1,714
Total Impact Estimation (MWh)	**7,157**	**2,218**

The total impact estimation is calculated by summing the individual UECs calculated for each appliance.

Among the variables applied to estimate UEC, both age (in years) and size (in cubic feet) are key explanatory variables that drive the estimates. Typically, older and larger units use more electricity for two reasons:

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

2. As units age, efficiency degrades.

Based on the evaluation team's prior experience with recycling programs and because this is the first year for the AEP Ohio Appliance Recycling program, the appliances collected during PY 2009 have been primarily older and larger units than those collected via a more established program (as in California). **Table** 4.5Table 4.5 provides the age and size characteristics of the units collected in PY 2009. These characteristics are taken from the database of equipment collected by JACO. Of the appliances picked up by JACO for recycling, 62 percent of refrigerators and 80 percent of freezers are over 20 years old. About 36 percent of both refrigerators and freezers are between 21 and 30 years old, and 26 percent of refrigerators and 44 percent of freezers are over 30 years old. Additionally, 84 percent of refrigerators and 92 percent of freezers were manufactured before the appliance standards changed to higher efficiency levels in 1993.

Table 4.5. Age Characteristics of Recycled Appliances

Appliance Type										
	0 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 50	Total Count
Refrigerator (count)	6	171	400	785	590	714	327	201	393	**3,587**
Refrigerator (percentage)	0.2	4.8	11.2	21.9	16.5	20.0	9.1	5.6	11.0	
Freezer (count)	4	26	73	160	135	325	178	186	207	**1,294**
Freezer (percentage)	0.3	2.0	5.6	12.4	10.4	25.1	13.8	14.4	16.0	

As shown in Table 4.6, the majority of refrigerators picked up by JACO for recycling are over 16 cubic feet or larger in size. Recycled refrigerators are typically larger than freezers, and the distribution of freezers is more diverse than refrigerators.

Table 4.6. Size Characteristics of Recycled Appliances

Appliance Type	[illegible] and smaller	[illegible] cubic feet	[illegible] cubic feet	[illegible] and larger	[illegible]
Refrigerators (count)	95	864	1871	757	3,587
Refrigerators (percentage)	2.7	24.1	52.2	21.1	
Freezers (count)	110	397	641	146	1,294
Freezers (percentage)	8.5	30.7	49.5	11.3	

Based on previous experience with recycling programs, the evaluation team estimates that the stock of these unwanted older appliances will decline over time as the program matures over several program years and the base of these very old, inefficient units available for recycling is reduced. This has implications for the expected average UECs of units collected by the program in subsequent years, which would likely be somewhat less than seen in PY 2009.

Part-use factors. The part-use factors are the estimation of a refrigerator or freezer appliance yearly operating characteristics if it had not been removed by the program. The evaluation team gathered specific information from the 102 program participants who were also included in the telephone surveys. The part-use factor captures the average number of months that a participant operated their appliance. For example, the AEP Ohio Program Plan savings number and the UEC assume the same operating characteristics over the course of a year. However, the part-use factor provides an adjustment to the number of months of actual operation. For example, if an appliance only operated three months of the year then only 25 percent (i.e., 3 months out of 12 months) of the savings associated with a full-year operation would apply. The part-use factor is used to adjust savings to yield estimates of annualized savings that can be attributed to the program.

Refrigerators. The evaluation assumes that any refrigerator that would have otherwise been kept in use (i.e., in the absence of the program) would have been used as a secondary and not as a primary refrigerator. Therefore, the part-use factor for all primary refrigerators that would have otherwise been kept is set at the average part-use reported by participants who disposed of a secondary refrigerator. This part-use was the number of months (divided by 12) that the

participant reported the unit would have been plugged in and running had the program not picked up the appliance. The average part-use factor taken from the telephone survey participants is 81 percent or 0.81.

Freezers. For freezers, the average part-use factor is based on a similar question for all participants who disposed of a freezer. The average part-use factor taken from the telephone participants is 85 percent or 0.85.

Table 4.7 reports the distribution of unit usage by appliance type and frequency of use for both refrigerators and freezers. The majority of participants claim they would have used the unit "always" if the program had not picked it up.

Table 4.7. Frequency of Usage in the Absence of the Program

Appliance Type	Never	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Refrigerators (count)	1	7	2	3	0	34	47
Refrigerators (percentage)	2.1	14.9	4.3	6.4	0	72.3	
Freezers (count)	2	1	2	1	0	22	28
Freezers (percentage)	7.0	3.6	7.1	3.6	0	78.6	

Seventy-four survey respondents reported recycling refrigerators through the program. Of those 74, 47 respondents reported that their refrigerators were used as a secondary or spare appliance. The 27 respondents who indicated that they recycled a primary refrigerator were not asked the telephone survey questions pertaining to part-use.

Part-year factors. Similarly to the part-use factor, the part-year factor adjusts the full-year savings determined by the two analyses approaches. The part-year factor was determined from the program tracking database. Each appliance record included the date that the appliance was picked up for recycling. The part-year factor adjusts the full-year savings to reflect the portion of time of the program year for which the appliance was removed from operation. PY 2009 started in January 2009 and ended in December 2009. Savings are not assumed for the whole year. Rather, they are only attributed to the program for PY 2009 for the time that the measure was actually implemented. For example, if an appliance was not removed until December 2009,

then savings would not be counted for the program months of January to November. The part-year factor would adjust the full-year savings to reflect only the month of December (i.e., 1/12 of the year).

The average part-year factor was determined to be 0.37, or 37%. When considering full months, 37% of a year is equivalent to five months (four months plus approximately 12 days where portions of months are credited as whole months). Five months is equivalent to 42% (i.e., 5 months / 12) and this value was applied to the AEP Ohio Program Plan assumption approach to determine the part-year savings. For the regression-based analysis, although the average factor is 37%, the factors calculated for each record were applied to determine individual part-year savings. JACP began picking up appliances on May 18th and stopped on December 30th. May 18th is equivalent to a part-year factor of 67% (i.e., 8 months / 12), and December is equivalent to 8% (i.e., 1 month / 12).

Savings Impacts Adjusted for Part-Use and Part-Year

Next, the evaluation team developed savings estimates for each type of appliance adjusted for part-use and part-year. Table 4.8 shows the adjusted values.

Table 4.8. Savings Adjusted for Part Use and Part-Year

	Full-Year Gross Savings	Part-Use Factor	Part-Use Savings	Part-Year Factor	Part-Year Savings
Refrigerators Average (kWh)	1,112	0.81	902	0.42	463
Refrigerators Total (MWh)	**3,989**	**0.81**	**3,436**	**0.42**	**1,662**
Freezers Average (kWh)	995	0.85	850	0.42	414
Freezers Total (MWh)	**1,287**	**0.85**	**1,168**	**0.42**	**536**
Refrigerators Average (kWh)	2,119	0.81	1,719	0.37	755
Refrigerators Total (MWh)	**7,157**	**0.81**	**5,806**	**0.37**	**2,550**
Freezers Average (KWh)	1,821	0.85	1,555	0.37	682
Freezers Total (MWh)	**2,218**	**0.85**	**1,895**	**0.37**	**831**

For the regression-based approach, average unit savings and part-year factors are shown as examples. The total impact estimation is calculated by summing the individual UECs calculated for each appliance. Additionally, individual part-year factors are determined for each record.

4.1.3 Program Impact Results

The tables below provide the PY 2009 evaluation-adjusted savings estimates for each measure. These results include the number of units recycled, the savings using the AEP Ohio Program Plan approach, and the regression-based impacts analysis approach that will provide AEP Ohio with additional planning information. The full-year and the part-use adjusted values are included.

Since the regression approach uses savings estimates for each unit recycled that are more closely matched to the characteristics of the actual recycled appliances, the regression based savings estimates should be the most accurate. As previously discussed, the appliances recycled through the AEP Ohio Appliance Recycling program were older on average than assumed in the program plan. Since refrigerators and freezers manufactured before 1993 use much more energy than similar appliances manufactured after that date, the age of the appliance recycled is strongly correlated with the energy savings from the recycled units.

The PY 2009 overall ex-ante energy savings are 6,306 MWh and the ex-ante demand savings are 0.691 MW. For Ohio Power Company, the ex-ante included 2,870 MWh of energy and 0.302 MW of demand savings. For Columbus Southern Power, the ex-ante included 3,436 MWh of energy and 0.389 MW of demand savings. These ex-ante savings are based on full-year energy savings. When compared to the AEP Ohio Program Plan savings estimates, the overall energy realization rate is 84% while the overall demand realization rate is 92%. The realization rates can also be broken down further by utility. For OPC, when compared to the Program Plan approach, the energy realization rate is 80% and the demand realization rate is 92%. For CSP, the energy realization rate is 87% while the demand realization rate is 92%. The regression-based analysis approach only examined energy savings, and the overall realization rate is 149%. Additionally, the realization rates for OPC and CSP are 137% and 159%, respectively.

Table 4.9. Appliance Recycling Data

Program Breakdown by Units Recycled	Refrigerators	Freezer	Total
Ohio Power Company	1,513	618	2,131
Columbus Southern Power	2,074	676	2,750
AEP Ohio Total	3,587	1,294	4,881

Table 4.10. PY 2009 Impact Parameter and Savings Estimates – Program Plan Savings Estimates

Parameter and Impact Estimates[1]	Refrigerator	Freezer	Total
Energy Savings			
Average Annual per Unit – kWh (full-year) [A]	1,112	995	-
Ohio Power Company – MWh (full-year) [B]	1,682	615	2,297
Columbus Southern Power – MWh (full-year) [C]	2,306	672	2,979
Total Program – MWh (full-year) [D = B + C]	**3,989**	**1,287**	**5,276**
Part-Use Factor [E]	81%	83%	
Average Annual per Unit – kWh (part-use) [F = A x E]	902	850	-
Ohio Power Company – MWh (part-use) [G = B x E]	1,365	525	1,890
Columbus Southern Power – MWh (part-use) [H = C x E]	1,871	574	2,445
Total Program – MWh (part-use adjusted) [I = D x E]	**3,235**	**1,010**	**4,335**
Part-Year Factor [J]	43%	42%	
Average Annual per Unit – kWh (part-year) [K = F x J]	463	414	-
Ohio Power Company – MWh (part-year) [L = G x J]	701	256	957
Columbus Southern Power – MWh (part-year) [M = H x J]	961	280	1,241
Total Program – MWh (part-year adjusted) [N = I x J]	**1,662**	**536**	**2,198**
Demand Reduction			
Average per Unit – MW [O]	0.143	0.128	-
Ohio Power – MW [P]	0.203	0.074	0.277
Columbus Southern Power – MW [Q]	0.278	0.081	0.359
Total Program – MW [R = P + Q]	**0.481**	**0.155**	**0.636**

1 Values may not sum due to rounding

2. The average part-year factor is adjusted to reflect a whole-month basis (i.e., 0.37 to 0.42, or 4.4 months to 5 months)

Table 4.11. PY 2009 Impacts Parameter and Savings Estimates – Regression-based Savings Estimates

Parameter and Impact Estimate	[illegible]	[illegible]	[illegible]
Energy Savings			
Average Annual per Unit – kWh (full-year) [A]	1,995	1,714	
Ohio Power Company – MWh (full-year) [B]	2,867	1,054	3,921
Columbus Southern Power – MWh (full-year) [C]	4,290	1,164	5,455
Total Program – MWh (full-year) [D = B + C]	**7,157**	**2,218**	**9,376**
Part-Use Factor [E]	[illegible]	[illegible]	[illegible]
Average Annual per Unit – kWh (part-use) [F = A x E]	1,619	1,464	-
Ohio Power Company – MWh (part-use) [G = B x E]	2,326	900	3,226
Columbus Southern Power – MWh (part-use) [H = C x E]	3,480	995	4,475
Total Program – MWh (part-use adjusted) [I = D x E]	**5,806**	**1,895**	**7,701**
Part-Year Factor [J]	[illegible]	[illegible]	[illegible]
Average Annual per Unit – kWh (part-year) [K = F x J]	711	642	
Ohio Power Company – MWh (part-year) [L = G x J]	1,008	386	1,394
Columbus Southern Power – MWh (part-year) [M = H x J]	1,542	446	1,988
Total Program – MWh (part-year adjusted) [N = I x J]	**2,550**	**831**	**3,382**

1 Values may not sum due to rounding

2. Part-year factors are determined on a whole-month basis while the resulting average of all records is presented here.

4.2 *Process*

The process evaluation component of the Consumer Appliance Recycling program evaluation focused on appliance usage data and satisfaction with program processes, including program enrollment, customer experiences of the appliance pickup, as well as incentive processing and payment. Data sources for the process evaluation include the participant survey and the in-depth interviews with program staff and program implementers, described previously.

4.2.1 Marketing and Promotion Strategy

The advertising agency of Runyon, Saltzman, and Einhorn, working as subcontractor to JACO, manages the marketing and promotion of the Appliance Recycling program, including targeting major metropolitan areas with television advertising. JACO's corporate communications department is tasked with promoting directly to customers through bill inserts and messaging on the program Web site.

A content review of the marketing material shows the messages to be clear and actionable, as well as consistent among bill inserts, television advertisements, and Web site postings. Advertisements and bill inserts are in full color, with very clear language about the intent of the program (picking up old refrigerators with no cost to the customer) and prominently display the amount of the incentive ($25). The advertisements clearly state how to schedule the appointment and also give various explanations about why someone should get rid of a spare fridge with "WANTED" postings with pictures of refrigerators and the television advertising featuring a line-up of offenders.

The amount of marketing conducted for this campaign appeared to be sufficient given that AEP Ohio reached the target goal of number of appliances picked up. Bill inserts and newspaper media were the most often cited sources of program knowledge among participants. When asked where they had first heard of the program, over a third of the surveyed participants recalled first seeing the program mentioned in a bill insert (35%) and another third first learned through the newspaper (34%). In total, 42% of respondents had seen references to the program from bill inserts and 40% in the newspaper. Distant third and fourth responses for seeing information about the program are TV ads (16%) and a friend, relative, or neighbor (15%).

Table 4.12. Where Customers Have Heard of the Appliance Recycling Program

Source	[illegible] (n=102)	[illegible] (n=102)	[illegible] (n=102)
Bill Insert	35%	7%	42%
Newspaper	34%	6%	40%
TV Ad	9%	7%	16%
Friend/Relative/Neighbor	8%	7%	15%
Other	5%	6%	11%
Radio Ad	3%	3%	6%
AEP Ohio Web site	3%	2%	5%
Don't know/No other sources	3%	–	–

4.2.2 Incentive Level for Participation

The incentive level remained at $25 throughout the first year of implementation. At this level, the program was able to successfully achieve the target quantity of appliances and adequately manage demand for recycling services. The $25 incentive was a motivating factor, with over half of participants surveyed (53%) saying it was one reason they were using the program to dispose of their appliance.

Ninety-percent (90%) of participants were satisfied with the size of the incentive, while 63% said they were very satisfied. No participants reported being dissatisfied with the size of the incentive payment they received as a result of their participation in the program.

Even though the goal for the number of recycled appliances was reached in PY 2009, it fell short of JACO's higher prediction for PY 2009 of 9,000 units recycled. As such, administrators at AEP Ohio along with JACO staff are planning to test the effect on program enrollment by increasing the rebate from $25 to $50 over a three-month period during PY 2010.

4.2.3 Participation in the Program

Participants were asked, unprompted, why they chose the AEP Ohio Appliance Recycling program to dispose of their appliance, instead of some other disposal method. The convenience

of the home pick-up was cited most frequently as the main reason for participation, though when adding all reasons mentioned, the cash incentive garnered recognition from over half the participants (53%). The third most frequently cited reason for participating was the recycling aspect (40%). Only two percent reported saving money on their electric bill as a reason for participation.

Table 4.13. Reasons Why Customers Chose the Appliance Recycling Program

Reason for Participation	Main Reason	Additional Reasons (Multiple Response)	Total
Convenience of home pickup	30%	14%	44%
$25 Cash Incentive	23%	30%	53%
Recycling/environmentally friendly	26%	13%	39%
Pick up was free	9%	4%	13%
Quick/quicker way of getting rid of appliance	2%	1%	3%
Save money on electric bill	2%	6%	8%
Other	9%	9%	18%
Don't know /no other reasons	0%	3%	3%

4.2.4 Participant Enrollment Process

Customer satisfaction with the sign-up process is high, with 99% of participants saying they were satisfied, and 79% were very satisfied. None were dissatisfied. Participants have two options to sign up for the program: calling to set up an appointment or through the AEP Ohio Web site. A majority of the participants surveyed signed up by telephone (82%) and most others signed up using the AEP Ohio Web site (17%). Participants who signed up via the phone said that the representative was polite and courteous (100%) and answered all of their questions about the program (99%). However, about 14% had to call more than once, though data was not collected to ascertain why they needed to call more than once.

Similarly, all of the 15 participants surveyed who had used the Web site to sign-up reported that the sign-up screen was easy to find and they received confirmation that their enrollment had been successful.

About 40% of participants had scheduled an appointment day within one week of calling about the program, and nearly three-quarters had an appointment within two weeks. About 7% had to wait 4 to 6 weeks for pickup. Most were satisfied with the time taken for pickup (94%), and two-thirds very satisfied. While all participants said they were able to schedule a pick-up date that was convenient for them, this percentage does not take into account potential participants who dropped out because they either could not find a convenient time, or those who scheduled and then dropped out because they found an alternative means of disposal before the pickup date. The mean reported time between scheduling the appointment and pickup was 1.73 weeks.

Table 4.14. Time Between Appointment and Pick-Up of Appliance

Amount of Time	[illegible]
Less than 1 week	16%
1 week	24%
2 weeks	33%
3 weeks	10%
4 to 6 weeks	7%
Don't know	9%

a. Only participants who had signed up themselves (as opposed to someone else in the household) were asked this question.

The program also is supposed to promote the energy and environmental benefits of recycling a spare or second appliance. When learning about the program, 88% of participants said they learned that older refrigerators and freezers are less efficient and use more energy than newer ones, and 93% said that they learned the coolant in the unit would be safely removed and that material that makes up the appliance would be reused.

4.2.5 Appliance Collection Process

JACO collection crews are instructed to call customers an unspecified number of days in advance to confirm appointments and remind customers that the appliances are supposed to be

plugged in, defrosted and cleaned out. A second reminder call is to be given when the crew is one or two customers ahead of the scheduled appointment to serve as a final confirmation and also to give customers an update if the time has changed due to traffic or weather conditions. Ninety-three percent of respondents said that they received a call in advance to confirm the appointment. Only one percent of participants said they did not receive such a phone call while six percent could not recall.

About nine percent of participants reported the collection team did not arrived on time. Even so, 97% of participants were satisfied with the collection team who came to pick up the appliance, with 76% reporting that they were "very satisfied." One participant was dissatisfied, citing damage to walls.

4.2.6 Incentive Payment Process

At the time of the evaluation, no goals around turnaround time between appliance pickup and receipt of rebate checks had been set. Therefore, this section will be more descriptive than evaluative. One of the recommendations at the end of the report addresses the need for goals in order to solidify expectations and measure performance. Table 4.15 summarizes the time reported by customers taken between pickup of the appliance(s) and receipt of check. There was quite a bit of variance around the time it took for customers to receive their checks based on recall. About 23% of participants said that they received payment within two weeks of pickup, 36% within three or four weeks, 19% within six weeks, and 6% said it took 8 or more weeks. Overall, 91% of participants were satisfied with the time it took to receive their check. Two customers were dissatisfied with the amount of time it took to receive payment, saying it had taken between five and nine weeks.

Table 4.15. Time Between Appointment and Receipt of Incentive Check

[illegible]	[illegible]
1 week or less	5%
2 weeks	18%
3 weeks	12%
4 weeks	24%
5 weeks	8%
6 weeks	11%
7 weeks	0%
8 weeks or more	6%
Don't know/Refused	17%

4.2.7 Overall Participant Satisfaction

Overall, 98% of customers were satisfied with their experience with the Appliance Recycling program, with 65% saying they were "very satisfied." On a scale of 0 to 10, the mean score for overall program satisfaction was rather high, at 9.32.

Table 4.16. Mean Satisfaction Scores

Dimension	[illegible]
Sign-up process	9.64
Collection team	9.52
AR program overall	9.32
Time between enrollment and pickup	9.28
Size of payment	9.03
AEP Ohio overall	9.00
Time between pickup and receiving check	8.83

Less than half of participants, 43%, said they have actually seen a reduction in their energy bill since their appliance was removed. Forty-six percent said they had not noticed a difference in their bill and 11% were not sure if they had seen a decrease. These responses may indicate that participants are not that attentive to changes in their electric bill. It is also possible that given seasonal variations in electric use, customers have a difficult time attributing changes in their bills to their own behaviors.

Table 4.17. Aspects of Appliance Recycling Program Customers Liked

What people liked about the program (Multiple Responses)	Total n=[illegible]
Did not have to remove appliance by myself	54%
$25 incentive payment	30%
Recycling of the appliance/environmental component	27%
Pick-up team did a nice job	25%
Short wait time between sign up and pick up of appliance	5%
Don't know/Refused	4%

Most popular among program participants was not having to deal with removing the appliance themselves. The incentive payment, environment, and satisfaction with pick-up team were all secondary reasons.

4.2.8 Additional Actions Taken by Participants

A majority (80%) of the participants surveyed said that they have taken additional actions to save energy at their home, based on their participation in the program. The most common changes that people have made are installing CFLs, turning off lights when not using them, and installing a new, more efficient furnace.

Nine percent of the respondents said they have participated in other AEP Ohio energy efficiency programs, namely the energy efficient lighting program and installation of smart meters. Most of those customers heard about these additional programs through bill inserts, 67%.

4.3 *Cost Effectiveness Review*

This section addresses the cost effectiveness of the Consumer Appliance Recycling program. Cost effectiveness is assessed through the use of the Total Resource Cost (TRC) test. Table 4.18 summarizes the unique inputs used in the TRC test.

Table 4.18. Inputs to Cost-Effectiveness Model for Appliance Recycling Program

Item	CSP	OPCo	Combined
Measure Life	6.6	6.6	-
Participants	1003672	771293	1,774,965
Annual Energy Savings	41,778,248	32,012,331	73,790,579
Coincident Peak Savings	157	121	278
Third Party Implementation Costs	$976,707	$769,528	$1,746,235
Utility Administration Costs	$182,804	$179,510	$362,314
Utility Incentive Costs	$1,012,417	$830,233	$1,842,650
Participant Contribution to Incremental Measure Costs	$994,927	$712,353	$1,707,280

Based on these inputs, the TRC ratio for CSP is 3.3 and 3.1 for OPCo, and the program passes the TRC test in each utility and for the program in its entirety. Table 4.19 summarizes the results of the cost-effectiveness tests. Results are presented for the Total Resource Cost test, the Ratepayer Impact Measure test, and the Utility Cost test. Since the participants did not contribute to costs, the Participant Cost test is not applicable.

Table 4.19. Cost Effectiveness Results for Appliance Recycling Program

Test Results for Prescriptive	CSP	DPCs
Total Resource Cost	3.3	3.1
Participant Cost Test	N/A	N/A
Ratepayer Impact Measure	0.3	0.3
Utility Cost Test	2.9	2.7

At this time, additional benefits related to reduction of greenhouse gas emissions have not been quantified in the calculation of the TRC. These additional benefits would increase the given TRC benefit/cost ratio.

Section 5. Conclusions and Recommendations

This section highlights the findings and recommendations from the evaluation of the Appliance Recycling program implemented by JACO on behalf of AEP Ohio. The objectives of the evaluation were to: (1) quantify energy and peak demand savings impacts from the program during PY 2009, and (2) to determine key process-related program strengths and weaknesses and provide recommendations to improve the program.

Following are the key findings and recommendations resulting from the impact and process evaluations for this program.

5.1 *Key Impact Findings*

The PY 2009 energy savings goal for this program was 4,665 MWh, with 4,669 refrigerators and freezers recycled. The reported number of units recycled was 4,881. The full-year energy savings, as reported using the AEP Ohio Program Plan assumptions, was greater than the program goal, at 5,276 MWh. However, when accounting for the part-use factor the resulting savings are less than the goal, at 4,335 MWh. Additionally, when accounting for the average part-year factor, the savings also are lower than the goal, at 2,198 MWh.

The full-year energy savings, as determined by the regression-based analysis methodology, was greater than the program goal, at 9,376 MWh. When accounting for the part-use factor, the savings also were greater than the program goal, at 7,701 MWh. When accounting for the part-year factor calculated for each record, the savings were less than the program goal, at 3,382 MWh. Finally for PY 2009, the demand saved by the program is based on the AEP Ohio Program Plan estimates for per-unit demand savings for refrigerators and freezers. The total demand saved was 636 kW.

The savings values adjusted by the part-year factor are significantly lower than the program goal savings. This result occurred because, on average, only five months of the whole year's savings could be attributed to the program. According to the tracking data, on average, appliances were picked up for recycling during the month of August. Therefore, on average, no savings occurred from January to July in PY 2009.

Conversely, the regression-based analysis calculated per-unit energy consumption levels and total savings to be significantly higher than that specified by the AEP Ohio Program Plan and the program goals, respectively, for both refrigerators and freezers. This reflects the fact that the program collected more units that were older than anticipated in PY 2009. Fully 26% of refrigerators and 44% of the freezers picked up by the program are over 30 years old and another 36% of each is between 21 and 30 years old. 84% of refrigerators and nearly all (92%) of the freezers collected by the program were manufactured before the 1993 standards change. The standards change resulted in a dramatic improvement in efficiency. Pre-1993 units are generally

considered "energy hogs" that use 3 to 4 times the energy of units made since the standards change.

5.1.1 Impact Recommendations

Since the regression approach uses savings estimates for appliance unit recycled that are more closely matched to the characteristics of the actual recycled appliances, the regression-based savings estimates should be the most accurate. As previously discussed, the appliances recycled through the AEP Ohio Appliance Recycling program were older on average than assumed in the AEP Ohio Program Plan. Since refrigerators and freezers manufactured before 1993 use much more energy than similar appliances manufactured after that date, the age of the appliance recycled is strongly correlated with the energy savings from the recycled units.

The evaluation was completed successfully although critical data was missing for some records within the tracking database. However, this missing data did not significantly effect the overall results because averages of data from the remaining tracking data were utilized. The evaluation team recommends that the program tracking data receive periodic data quality reviews for data quality and completeness. Quality reviews should focus on identifying the capture rate of specific parameters that have significant impacts on the overall savings calculations. For example, the regression-based approach relies on equipment age, size, configuration, defrost mode, and label amps. Quality reviews could focus on these key parameters to verify that accurate records are maintained.

5.2 *Key Process Findings*

This first-year process evaluation was designed to provide early feedback on program performance and operational efficiency and to identify key process-related program strengths and weaknesses and provide recommendations to improve the program.

- **Customer satisfaction was high.** The program was well-administered. Overall, 97% of participants were satisfied with their experience with the Appliance Recycling program, with 65% saying they were "very satisfied." Customers reported a high degree of satisfaction with the sign-up process and appliances were picked up and payments processed in timely fashion.

- **Based on participant surveys, operations are running smoothly.** According to participants the majority of appliances were picked up within two weeks and the enrollment process is simple. Participants are also happy with the enrollment process, scheduling, and the collection of appliances.

- **The rebate is a secondary concern for program participation.** The majority of participants wanted to avoid the hassle of disposing of the appliances themselves.

- **Tracking database had some missing data.** A process-related component that could use improvement is the accuracy and completeness of the tracking database. The evaluation team recommends that AEP develop or improve the QA/QC process.

- **While by most indicators the program is running well, there is a lack of specificity around goals outside of units collected.** The program is lacking explicit goals around customer satisfaction, turnaround time between appliance collection and receipt of rebate check, and program awareness among AEP Ohio customers.

- **Data on program drop-outs should be reported.** While participant satisfaction with the program is high, it is difficult to know how many participants have dropped out and how many have dropped out due to low levels of satisfaction, finding difficult times to schedule appliance collection, or too much time lapsing between time of appointment and collection.

5.2.1 Process Recommendations

This section highlights the recommendations found in this evaluation of the first year of the AEP Ohio Appliance Recycling program. The primary objectives of this study were to quantify the impacts resulting from appliances recycled through the Appliance Recycling plan, and review program processes based on insights provided from the perspectives of those most closely involved in them. Below are the key conclusions and recommendations.

1. **Carefully monitor the tracking system for missing data.** The evaluation was completed successfully although critical data was missing for some records within the tracking database. However, this missing data did not significantly effect on the overall results because averages of data from the remaining tracking data were utilized. The evaluation team recommends that the program tracking data receive periodic data quality reviews for data quality and completeness. Quality reviews should focus on identifying the capture rate of specific parameters that have significant impacts on the overall savings calculations. For example, the regression-based approach relies on equipment age, size, configuration, defrost mode, and label amps. Quality reviews could focus on these key parameters to verify that accurate records are maintained
2. **In addition to units collected, reports to AEP Ohio (and therefore the tracking data) need to include process variables.** These variables include the number of days between appliance collection and check mailing, number of days between date appointment was made and appliance collection, data on near participants including reason for drop out, follow-up history on missed appointments, and number of times participant and near participants called JACO and reason behind call.
3. **Create clear goals around leading process indicators.** The program is lacking explicit goals around customer satisfaction, turnaround time between appliance collection and receipt of rebate check, and program awareness among AEP Ohio customers. The monitoring of these leading indicators is important because they can

alert program administrators to problems in the program before the end of year evaluations and help AEP Ohio keep on track with its more direct impact goals.

4. **Continue to reinforce the value of recycling older appliances in customer communications.** Just under one-third (32%) of refrigerator and 26% of freezer participants surveyed said that they would have continued to use the secondary appliance had it not been for the program. This highlights that there are customers out there that need convincing that they do not need a second refrigerator or stand-alone freezer.
5. **Educate customers on energy bill savings that would result from recycling an old appliance.** Only 43% of participants noticed a reduction in their electric bills due to recycling their appliance. Participants may have a difficulty associating changes in their electric bill to their own energy saving behaviors. When customers do see the savings and are able to attribute them to their behaviors, they will be more likely to make additional changes in the future.
6. **Future evaluation work should examine the incremental impact of increased incentive on participation.** During a three-month period in PY 2010, AEP Ohio and JACO have agreed to run a pilot program to determine whether increasing the incentive level from $25 to $50 will significantly increase participation in the program. Because awareness is not being tracked among AEP Ohio customers in general, it is unclear whether increasing the incentive level will result in higher numbers of participants.
7. **AEP Ohio may need to consider new ways to integrate its programs that serve residential customers.** While AEP Ohio has been making efforts to encourage cross-participation in its programs (e.g., leaving literature with customers after appliance collection) there may be other ways to leveraging participation in one program into participation in others. Of the participants surveyed, 80% took additional action to save energy, but only nine percent participated in another AEP Ohio program.
8. **Staff at both AEP Ohio and JACO should continue to pursue partnerships with "big box" appliance retailers** that are offering free recycling of used appliances when customers purchase a new appliance from them. Some of the recycled appliances may be returned to the electricity grid through the secondary re-sale market. Sears has recently launched a new television advertising campaign to let customers know they are RAR (Responsible Appliance Recycling) certified and that they will pick up used appliances free of charge with the purchase of a new appliance. AEP Ohio may need to offer incentives to these big box retailers for units that might otherwise be sold to the secondary market. If a partnership can be established, AEP Ohio could recycle, and take credit for recycling, those appliances that would have remained in operation.

Section 6. Appendices

6.1 *Data Collection Instruments*

The data collection instruments used in this evaluation consisted of the program participant survey and in-depth interview guides for the AEP Ohio program manager and JACO program management and implementers.

6.1.1 AEP Ohio Appliance Recycling Participant Survey

AEP OHIO CONSUMER PROGRAMS – APPLIANCE RECYCLING PROGRAM

PARTICIPANT SURVEY – APPLIANCE RECYCLING

QUOTA CHECK:

Strata Code (Sample)	Name	Quota (Total N=100)
1	TOP FREEZER	n=48
2	FREEZER	n=27
3	OTHER REFRIGERATOR	n=25

INTRODUCTION AND SCREENER

Hello, this is [SURVEYOR NAME] from DataPrompt International calling on behalf of AEP Ohio. This is not a sales call. We are contacting customers who had refrigerators or freezers removed through an appliance pick-up and recycling program offered by AEP Ohio. May I please speak with [CUSTOMER_NAME]?

Are you the person who was most involved and familiar with the refrigerator or freezer removal? (IF NOT: May I please speak with the person who was most involved with the removal?)

IF NO REFRIGERATOR OR FREEZER PICKED UP: THANK AND TERMINATE

CONTINUE WITH RIGHT PERSON: We are conducting a study to evaluate AEP Ohio's appliance pick up and recycling program and would like to include your opinions. This is required by the Public Utilities Commission of Ohio and will be used to verify the effectiveness of the program and to make improvements.

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

This call may be monitored or recorded for quality purposes.

SCREENING QUESTIONS

S0. Is your electric company AEP Ohio, Ohio Power (OP), Columbus Southern Power (CSP) or someone else? (DO NOT READ)

1. AEP OHIO
2. OHIO POWER/OP
3. COLUMBUS SOUTHERN POWER/CSP
4. SOMEONE ELSE [TERMINATE]
5. (Don't know)
6. (Refused) [TERMINATE]

S1. Our records show that you had [IF STRATA 1 OR 3: one or more refrigerator / IF STRATA 2: one or more freezer] picked up by AEP Ohio or its subcontractor JACO. Is this correct?

01 YES, CORRECT
97 NO, IT WAS [RECORD VERBATIM AND TERMINATE]
98 (DON'T KNOW) [TERMINATE]
99 (REFUSED) [TERMINATE]

READ SECTIONS A AND B IF STRATA 1 OR 3

SECTION A: REFRIGERATOR CHARACTERISTICS

S2b Next, I'm going to ask you some specific questions about the refrigerator that was picked up by AEP Ohio.

A1 Were you using this refrigerator as your main refrigerator, or had it been a secondary or spare? If you recently bought a new main refrigerator and were just waiting for the old one that had been used as your main refrigerator to be picked up, it should be classified as "main." (READ IF NEEDED: A MAIN REFRIGERATOR IS TYPICALLY IN THE KITCHEN, A SECONDARY OR SPARE IS USUALLY KEPT SOMEPLACE ELSE AND MIGHT OR MIGHT NOT BE RUNNING.) [SINGLE PUNCH]

1 MAIN
2 SECONDARY OR SPARE
3 (N/A - RESPONDENT IS NOT PRIMARY USER OF FRIDGE (LANDLORD, ETC.)) [TERMINATE]
8 (DON'T KNOW) [TERMINATE]
9 (REFUSED) [TERMINATE]

A2 [ASK IF A1=2] How long had you been using this refrigerator as a secondary or spare?

[READ IF NEEDED: "How long had it been a spare when you decided to get rid of it?"]

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

A3 [ASK IF A1=2] Thinking just about the past year, was the spare refrigerator plugged in and running...? (READ LIST) [SINGLE PUNCH]

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

A4 [ASK IF A3=2 OR 3] If you add up the total time your spare refrigerator was plugged in and running during the last 12 months that you had it, about how many total months would that be? Your best estimate is okay. (ENTER NEAREST MONTH)

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

A4a [ASK IF A3=2 OR 3] Was the refrigerator running during the summer or was it mainly running during other times of the year? [SINGLE PUNCH]

1. RUNNING DURING THE SUMMER
2. MAINLY RUNNING OTHER TIMES OF THE YEAR
3. (A MIX OF BOTH SUMMER AND OTHER TIMES OF THE YEAR)
8. (DON'T KNOW)
9. (REFUSED)

A5 Where would the refrigerator have been located if it had not been removed by AEP Ohio? (DO NOT READ) [SINGLE PUNCH]

01 (KITCHEN)
02 (GARAGE)
03 (PORCH/PATIO)
04 (BASEMENT)

97 (OTHER (SPECIFY:))
98 (DON'T KNOW)
99 (REFUSED)

A5B [ASK IF A5=2, 3, 4 OR 97] Was the space where the refrigerator would have been located heated or not?

1 YES
2 NO
3 (HEATED PART OF THE YEAR)
8 (DON'T KNOW)
9 (REFUSED)

A5C [ASK IF A5=1, 2, 3, 4 OR 97] Was the space where the refrigerator would have been located air-conditioned or not?

1 YES
2 NO
3 (AIR CONDITIONED PART OF THE YEAR)
8 (DON'T KNOW)
9 (REFUSED)

A6 How old was the refrigerator when AEP Ohio removed it?

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

A7 Did you replace the refrigerator that AEP Ohio picked up with another one?

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

[SKIP TO A9 IF A7=2, 8 OR 9]

Please think about the refrigerator that *replaced* the refrigerator that AEP Ohio removed. This may be a new refrigerator or it may be a refrigerator you moved from another place in the house.

A8aa. Did you get the replacement refrigerator before or after the old refrigerator was picked up? [SINGLE PUNCH]

1 BEFORE
2 AFTER
3 (GOT IT THE SAME DAY)
8 (DON'T KNOW)
9 (REFUSED)

A8a [ASK IF A8AA=1 OR 2] How long [IF A8AA=1: before / IF A8AA=2: after] the old one was picked-up did you get the replacement refrigerator? (READ LIST) [SINGLE PUNCH]

01 Within one to two weeks
02 Within one month
03 Within two to three months
04 Within four to six months
05 Within six to twelve months/ one year
06 More than one year
97 (Other (Please specify))
98 (Don't know)
99 (Refused)

A8b Was this replacement refrigerator brand new or used?

1. BRAND NEW
2. USED
8. (DON'T KNOW)
9. (REFUSED)

A8g [ASK IF A8b =2] How old is this replacement refrigerator?

[NUMERIC OPEN END RECORD IN YEARS]
00 (LESS THAN ONE YEAR)
98 (DON'T KNOW)
99 (REFUSED)

A8c Please keep thinking about the refrigerator that has taken the place of the refrigerator taken by AEP Ohio. Does your replacement refrigerator have ... (READ LIST) [SINGLE RESPONSE]

01 A single door, with a freezer compartment inside
02 Two doors, side by side
03 A Top freezer
04 Or a Bottom freezer?
97 (Other (SPECIFY:___))

98 (Don't know)
99 (Refused)

A8d Is the replacement refrigerator frost free or manual defrost? [SINGLE RESPONSE]

01 FROST FREE
02 MANUAL DEFROST
97 (OTHER (SPECIFY:___))
98 (DON'T KNOW)
99 (REFUSED)

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

1 LARGER
2 SMALLER
3 SAME SIZE
8 (DON'T KNOW)
9 (REFUSED)

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

A9 When you first heard about AEP Ohio's appliance recycling program, were you already considering getting rid of this refrigerator? This could have been by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center.

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

A10a. If you had been unable to get rid of your refrigerator through the AEP Ohio appliance recycling program, would you have still gotten rid of the refrigerator or would you have kept it? [SINGLE RESPONSE]

1 GOTTEN RID OF IT
2 KEPT IT
8 (DON'T KNOW)
9 (REFUSED)

A10b. [ASK IF A10a = 1] If the AEP Ohio program hadn't been available, would you have gotten rid of the refrigerator within 6 months of when you did, within a year of when you did, or would it have taken longer than a year for you to get rid of this refrigerator?

1. WITHIN 6 MONTHS
2. WITHIN A YEAR
3. OVER A YEAR
8. (DON'T KNOW)
9. (REFUSED)

SECTION B: CONSIDERATION OF ALTERNATIVES SECTION

B1 [ASK IF A10a = 1] Now suppose that AEP Ohio appliance recycling program hadn't been available. I am going to read a list of alternative ways that you could have disposed of this refrigerator. Please tell me which one you would have been most likely to use to get rid of this refrigerator. Would you have... (READ LIST) [RANDOMIZE. SINGLE PUNCH]

1. Sold it
2. Given it away for free
3. Have it removed by the dealer you got your new or replacement refrigerator from
4. Taken it to a dump or recycling center
5. Hired someone to take it to a dump or recycling center
6. (KEEP IT)
8. (DON'T KNOW)
9. (REFUSED)

B2 What was the condition of the refrigerator? Would you say ... (READ LIST) [SINGLE PUNCH]

1. It worked and was in good physical condition
2. It worked but needed minor repairs like a door seal or handle
3. It worked but had some bigger problems
4. (IT DIDN'T WORK)
8. (DON'T KNOW)
9. (REFUSED)

B3 Thinking about the refrigerator that AEP Ohio picked up, how much money do you think it would have cost each month to run it if it were running full-time? (DO NOT READ LIST UNLESS NECESSARY) [SINGLE PUNCH]

1 Nothing
2 $1 to $5
3 $6 to $10
4 $11 to $15

5 $16 to $20
6 More than $20
8 (DON'T KNOW)
9 (REFUSED)

[SKIP TO B5 IF A10A=1, 8 OR 9]

B4A You mentioned you would have kept this refrigerator if the AEP Ohio appliance recycling program wasn't available. If you had kept the refrigerator, would it have been stored unplugged, or used as a spare? [SINGLE PUNCH]

1 STORED IT UNPLUGGED
2 USED IT AS A SPARE
3 (BOTH-STORE IT AND USE IT)
4 (WOULD NOT HAVE KEPT IT)
8 (DON'T KNOW)
9 (REFUSED)

[SKIP TO B5 IF B4A=1, 4, 8 OR 9]

B4B For how many years would you have continued using this refrigerator as a spare? IF NEEDED: Your best estimate is fine.

[NUMERIC OPEN END]
00 (LESS THAN 1 YEAR)
96 (UNTIL IT BROKE, INDEFINITELY)
98 (DON'T KNOW)
99 (REFUSED)

B4C Where would this refrigerator have been located if you hadn't gotten rid of it and instead had used it as a spare? IF NEEDED, CLARIFY: What room? IF NEEDED: Your best GUESS is fine. (DO NOT READ LIST) [SINGLE PUNCH]

01 (KITCHEN)
02 (GARAGE)
03 (PORCH)
04 (BASEMENT)
97 (OTHER (SPECIFY:___))
98 (DON'T KNOW)
99 (REFUSED)

B4D [ASK IF B4C = 2, 3, 4 OR 97] Would this have been a heated space?

1. YES
2. NO
3. (PART OF THE YEAR)
8. (DON'T KNOW)
9. (REFUSED)

B4E [ASK IF B4C = 1, 2, 3, 4 OR 97] Would this have been an air-conditioned space?

1 YES
2 NO
3 (PART OF THE YEAR)
8. (DON'T KNOW)
9. (REFUSED)

B5 There may have been a number of reasons why you chose to get rid of the refrigerator that we've been discussing. Using a 0 to 10 scale where 0 is not at all important and 10 is extremely important, please tell me how important this/these reason(s) was/were in your decision to get rid of it? [GRID - # COLUMN, ATTRIBUTES = ROWS]

a. The refrigerator was expensive to run
b. **[ASK IF A1=2]** The refrigerator was a spare that I did not use very much
c. **[ASK IF A7=1]** The refrigerator was old and I wanted something with more modern features
d. **[ASK IF A7=1 AND A8e1=1, 8 or 9]** I wanted a bigger refrigerator

READ SECTIONS C AND D IF STRATA 2

SECTION C: FREEZER CHARACTERISTICS

Next, I'm going to ask you some specific questions about the freezer that was picked up by AEP Ohio.

C1 How long had you been using this freezer?

[READ IF NEEDED: "How long had it been used <u>when you decided to get rid of it.</u>"]

[NUMERIC OPEN END RECORD IN YEARS]
00 (LESS THAN ONE YEAR)
96 (N/A – RESPONDENT NOT PRIMARY USER (LANDLORD, ETC.)) [TERMINATE]
98 (DON'T KNOW)
99 (REFUSED)

C2 Thinking just about the past year, was the freezer plugged in and running ... (READ LIST) [SINGLE PUNCH]

1 All the time
2 For special occasions only
3 During certain months of the year only, or
4 Was it never plugged in and running
8 (DON'T KNOW)
9 (REFUSED)

C3 **[ASK IF C2=02 OR 03]** If you add up the total time your freezer was plugged in and running during the last 12 months that you had it, about how many total months would that be? Your best estimate is okay. (ENTER NEAREST MONTH)

[RECORD IN MONTHS]
00 (LESS THAN 1 MONTH)
98 (DON'T KNOW)
99 (REFUSED)

C4 **[ASK IF C2=02 OR 03]** Was the freezer running during the summer or was it mainly running during other times of the year? (DO NOT READ LIST)

1. RUNNING DURING THE SUMMER
2. MAINLY RUNNING OTHER TIMES OF THE YEAR
3. (A MIX OF BOTH SUMMER AND OTHER TIMES OF THE YEAR)
8. (DON'T KNOW)
9. (REFUSED)

C5 Where would the freezer have been located if it had not been removed by AEP Ohio? (DO NOT READ LIST) [SINGLE PUNCH]

01 (KITCHEN)
02 (GARAGE)
03 (PORCH/PATIO)
04 (BASEMENT)
97 (OTHER (SPECIFY:))
98 (DON'T KNOW)
99 (REFUSED)

C5B [ASK IF C5=2,3,4, OR 97] Was the space where the freezer would have been located heated or not?

1 YES
2 NO
3 (HEATED PART OF THE YEAR)
8 (DON'T KNOW)
9 (REFUSED)

C5C [ASK IF C5=1, 2,3,4, OR 97] Was the space where the freezer would have been located air-conditioned or not?

1 YES
2 NO
3 (AIR CONDITIONED PART OF THE YEAR)
8 (DON'T KNOW)
9 (REFUSED)

C6 How old was the freezer when AEP Ohio removed it?

[NUMERIC OPEN END RECORD IN YEARS]
00 (LESS THAN ONE YEAR)
98 (DON'T KNOW)
99 (REFUSED)

C7 Did you replace the freezer that AEP Ohio picked up with another one?

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

[SKIP TO TC9 IF C7=2, 8 OR 9]

C8aa Did you get the replacement freezer before or after the old freezer was picked up?

1 BEFORE
2 AFTER
3 (GOT IT THE SAME DAY)
8 (DON'T KNOW)
9 (REFUSED)

C8a [ASK IF C8AA=1 OR 2] How long [IF C8AA=1: before / IF C8AA=2: after] the old one was picked-up did you get the replacement freezer? (READ LIST) [SINGLE PUNCH]

01 Within one to two weeks
02 Within one month
03 Within two to three months
04 Within four to six months
05 Within six to twelve months/ one year
06 More than one year later
97 (OTHER (SPECIFY))
98 (DON'T KNOW)
99 (REFUSED)

C8b Was this replacement freezer brand new or used?

1. BRAND NEW
2. USED
8. (DON'T KNOW)
9. (REFUSED)

C8g [ASK IF C8B=2] How old is this replacement freezer?

[NUMERIC OPEN END RECORD IN YEARS]
00 (LESS THAN ONE YEAR)
98 (DON'T KNOW)
99 (REFUSED)

C8c. Is your replacement freezer … (READ LIST) [SINGLE PUNCH]

01 A chest freezer or
02 An upright freezer
97 (OTHER (SPECIFY:___))
98 (DON'T KNOW)
99 (REFUSED)

C8d. Is the replacement freezer frost free or manual defrost? [SINGLE PUNCH]

01 FROST FREE
02 MANUAL DEFROST
97 (OTHER (SPECIFY:___))
98 (DON'T KNOW)

99 (REFUSED)

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

1 LARGER
2 SMALLER
3 SAME SIZE
8 (DON'T KNOW)
9 (REFUSED)

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

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

TC9. Now let's get back to your old freezer that was removed by AEP Ohio.

C9 When you first heard about AEP Ohio's appliance recycling program, were you already considering getting rid of this freezer? This could have been by selling it, giving it away, having someone pick it up, or taking it to the dump or a recycling center.

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

C10 If you had been unable to get rid of your freezer through the AEP Ohio appliance recycling program, would you have still gotten rid of the freezer, or would you have kept it? [SINGLE PUNCH]

1 GOTTEN RID OF IT
2 KEPT IT
8 (DON'T KNOW)
9 (REFUSED)

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

1. WITHIN 6 MONTHS
2. WITHIN A YEAR
3. OVER A YEAR
8. (DON'T KNOW)
9. (REFUSED)

SECTION D: CONSIDERATION OF ALTERNATIVES SECTION

D1 [ASK IF C10=1]Now suppose that the AEP Ohio appliance recycling program hadn't been available. I am going to read a list of alternative ways that you could have disposed of this freezer. Please tell me which one you would have been most likely to use to get rid of this freezer. Would you have... (READ LIST) [RANDOMIZE. SINGLE PUNCH]

1. Sold it
2. Given it away for free
3. Have it removed by the dealer you got your new or replacement freezer from
4. Taken it to a dump or recycling center
5. Hired someone to take it to a dump or recycling center
6. (KEEP IT)
8. (DON'T KNOW)
9. (REFUSED)

D2 What was the condition of the freezer? Would you say ... (READ LIST) [SINGLE PUNCH]

1 It worked and was in good physical condition
2 It worked but needed minor repairs like a door seal or handle
3 It worked but had some bigger problems
4 (IT WASN'T WORKING)
8 (DON'T KNOW)
9 (REFUSED)

D3. Thinking about the freezer that AEP Ohio picked up, how much money do you think it would have cost each month to run it if it were running full-time? (DO NOT READ LIST UNLESS NECESSARY) [SINGLE PUNCH]

1 Nothing
2 $1 to $5
3 $6 to $10

4 $11 to $15
5 $16 to $20
6 More than $20
8 (DON'T KNOW)
9 (REFUSED)

[SKIP TO D5 if C10=1, 8 OR 9]

D4A You mentioned you would have kept this freezer if the AEP Ohio appliance recycling program wasn't available. If you had kept the freezer, would it have been stored unplugged, or would you have continued using it? [SINGLE PUNCH]

1 STORED IT UNPLUGGED
2 CONTINUED USING IT
3 (BOTH-STORE IT AND USE IT)
4 (WOULD NOT HAVE KEPT IT)
8 (DON'T KNOW)
9 (REFUSED)

[SKIP TO D5 IF D4A=1, 4, 8 OR 9]

D4B For how many years would you have continued using this additional freezer? IF NEEDED: Your best estimate is fine.

[NUMERIC OPEN END]
00 (LESS THAN 1 YEAR)
96 (UNTIL IT BROKE, INDEFINITELY)
98 (DON'T KNOW)
99 (REFUSED)

D4C Where would this freezer have been located if you hadn't gotten rid of it and instead had continued using it? IF NEEDED, CLARIFY: What room? IF NEEDED: Your best guess is fine. (DO NOT READ LIST) [SINGLE PUNCH]

01 (KITCHEN)
02 (GARAGE)
03 (PORCH)
04 (BASEMENT)
97 (OTHER (SPECIFY:___))
98 (DON'T KNOW)
99 (REFUSED)

D4D. [ASK IF D4C = 2, 3, 4 OR 97] Would this have been a heated space?

1. YES
2. NO
3. (PART OF THE YEAR)
8. (DON'T KNOW)
9. (REFUSED)

D4E [ASK IF D4C = 1, 2, 3, 4 OR 97] Would this have been an air-conditioned space?

1 YES
2 NO
3 (PART OF THE YEAR)
8. (DON'T KNOW)
9. (REFUSED)

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

a. The freezer was expensive to run
b. I did not use the freezer very much
c. **[ASK IF C7=1]** The freezer was old and I wanted something with more modern features
d. **[ASK IF C7=1 AND C8e1=1, 8 or 9]** I wanted a bigger freezer

PROCESS QUESTIONS

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

G1 How did you <u>first</u> learn about the Appliance Recycling Program? (DO NOT READ LIST) [SINGLE PUNCH]

01. (BILL INSERT)
02. (TV AD)
03. (FRIEND/RELATIVE/NEIGHBOR)
04. (AEP OHIO WEB SITE)
05. (NEWSPAPER)
06. (COMMUNITY EVENT)
97. (OTHER____)
98. (DON'T KNOW)

99. (REFUSED)

G2 Since you first learned about the program, have you heard about the program from any other sources? If yes, where else? (DO NOT READ LIST) [DO NOT SHOW ANSWER SELECTED IN G1. MULTIPLE PUNCH]

01. (BILL INSERT)
02. (TV AD)
03. (FRIEND/RELATIVE/NEIGHBOR)
04. (AEP OHIO WEB SITE)
05. (NEWSPAPER)
06. (COMMUNITY EVENT)
97. (OTHER____)
96. (NO/NO OTHER SOURCES)
98. (DON'T KNOW)
99. (REFUSED)

G2a. [SKIP IF G1=01 OR G2=01]Have you seen the program mentioned in an AEP Ohio bill insert?

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

G2b. [SKIP IF G1=02 OR G2=02] Have you seen the program mentioned in an AEP Ohio television advertisement?

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

G2c. [SKIP IF G1=05 OR G2=05] Have you seen the program mentioned in an AEP Ohio newspaper ad?

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

G3. At the time you found out about the pick-up service, did you receive information or learn that older refrigerators and freezers are less efficient and use more energy than newer ones?

1. YES, RECEIVED INFORMATION
2. NO
8. (DON'T KNOW)
9. (REFUSED)

G3aa. Did you learn that the refrigerator or freezer that is picked up by the program would be recycled, which means that the coolant in the unit would be safely removed and the materials that the unit is made of would be reused?

1. YES, RECEIVED INFORMATION
2. NO
8. (DON'T KNOW)
9. (REFUSED)

G3a. There are a number of ways you could have gotten rid of your appliance(s). What is the MAIN reason you chose the AEP Ohio Appliance Recycling Program instead of some other way? (DO NOT READ LIST) [SINGLE PUNCH]

01. ($25/CASH INCENTIVE)
02. (THE CONVENIENCE OF THE HOME PICK-UP/DON'T HAVE TO TAKE IT SOMEPLACE MYSELF)
03. (PICK UP WAS FREE)
04. (APPLIANCE WAS RECYCLED/WAS DISPOSED OF IN A WAY THAT WAS GOOD FOR ENVIRONMENT)
05. (WAS RECOMMENDED BY FRIEND/FAMILY)
06. (WAS RECOMMENDED BY RETAILER)
07. (DID NOT KNOW OF ANY OTHER WAY/NO OTHER OPTION)
97. (OTHER_SPECIFY)
98. (DON'T KNOW)
99. (REFUSED)

G3b. Were there any other reasons? (DO NOT READ LIST) [DO NOT SHOW ANSWER SELECTED IN QG3a. MULTIPLE PUNCH]

01. ($25/CASH INCENTIVE)
02. (THE CONVENIENCE OF THE HOME PICK-UP/DON'T HAVE TO TAKE IT SOMEPLACE MYSELF)
03. (PICK UP WAS FREE)
04. (APPLIANCE WAS RECYCLED/WAS DISPOSED OF IN A WAY THAT WAS GOOD FOR ENVIRONMENT)

05. (WAS RECOMMENDED BY FRIEND/FAMILY)
06. (WAS RECOMMENDED BY RETAILER)
07. (DID NOT KNOW OF ANY OTHER WAY/NO OTHER OPTION)
97. (OTHER_SPECIFY)
96. (NO OTHER REASON)
98. (DON'T KNOW)
99. (REFUSED)

G4aa. Once you decided to participate, the first step was signing up for the program. Are you the one that took care of this, or did someone else in your household sign up?

1. I SIGNED UP
2. SOMEONE ELSE SIGNED UP
8. (DON'T KNOW)
9. (REFUSED)

[SKIP TO G8B IF G4AA=2, 8 OR 9]

G4b. Did you sign up online or on the phone?

01. TELEPHONE
02. ONLINE
97. (OTHER [OPEN END])
98. (DON'T KNOW)
99. (REFUSED)

G4c. [ASK IF G4b=02] Was it easy to find the sign up screen on the Web site?

1. YES
2. NO
8. (DON'T KNOW)
9. (REFUSED)

G4d. [ASK IF G4b=02] Did the Web site answer all your questions about the appliance recycling program?

1. YES
2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G4e. [ASK IF G4b=02] Did you receive confirmation that your sign up had been successful?

1. YES

2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G4f. [ASK IF G4b=1] Was the representative you spoke to on the telephone polite and courteous?

1. YES
2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G4g. [ASK IF G4b=1] Did the representative answer all your questions about the program?

1. YES
2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G4h. [ASK IF G4b=1]Did you have to call more than once?

1. YES
2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G5. Were you able to schedule a pick-up date and time that was convenient for you?

1. YES
2. NO
8. (DON'T KNOW)
9. (REFUSED)

G4. On a scale of 0 to 10 where 0 is very dissatisfied and 10 is very satisfied, how satisfied are you with the sign up experience?

0. 0 [VERY DISSATISFIED]
1. 1

2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY SATISFIED]
98. (DON'T KNOW)
99. (REFUSED)

G4a. [ASK IF G4=0,1,2,3] Why did you rate it that way? (PROBE AND CLARIFY)

97 (OPEN END)
98 (Don't know)
99 (Refused)

G6. How much time passed between when you scheduled the appointment and when your appliance(s) was/were picked up? (NOTE TO INTERVIEWER: IF RESPONDENT SAYS "ABOUT A WEEK", RECORD AS 1 WEEK)

00[ENTER DAYS AND WEEKS]

98. (DON'T KNOW)
99. (REFUSED)

G7. On a scale of 0 to 10 where 0 is very dissatisfied and 10 is very satisfied, how satisfied are you with the time it took between when you scheduled the appliance pickup and when it actually got picked up?

0. 0 [VERY DISSATISFIED]
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY SATISFIED]
98. (DON'T KNOW)
99. (REFUSED)

G8b. Just before the pick-up took place, did you receive a call in advance to confirm the appointment or to let you know the collection team was coming?

1. YES
2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G8c. Did the collection team arrive on time?

1. YES
2. NO
3. (NOT APPLICABLE)
8. (DON'T KNOW)
9. (REFUSED)

G8. On a scale of 0 to 10 where 0 is very dissatisfied and 10 is very satisfied, how satisfied were you with the collection team who picked up your appliance(s)? [REPEAT SCALE IF NECESSARY]

0. 0 [VERY DISSATISFIED]
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY SATISFIED]
11. (WASN'T AT HOME)
98. (DON'T KNOW)
99. (REFUSED)

G8a. [ASK IF G8=0, 1,2,3] Why did you rate it that way?

97 (OPEN END)
98 (Don't know)
99 (Refused)

G9. On that same scale from 0 to 10, how satisfied are you with the size of the payment you received as a result of your participation in the AEP Ohio Appliance Recycling Program? [REPEAT SCALE IF NECESSARY]

0. 0 [VERY DISSATISFIED]
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY DISSATISFIED]
98. (DON'T KNOW)
99. (REFUSED)

G9a. [ASK IF G9=0, 1,2,3] Why did you rate it that way? (PROBE AND CLARIFY)

(OPEN END)
(DON'T KNOW)
(REFUSED)

G10b. How long did it take to get the check after your appliance was picked up? (READ LIST) [SINGLE PUNCH]

01. 1 week or less
02. 2 weeks
03. 3 weeks
04. 4 weeks
05. 5 weeks
06. 6 weeks
07. 7 weeks
08. 8 weeks or more
97. (OTHER, SPECIFY)
98. (DON'T KNOW)
99. (REFUSED)

G10. How satisfied are you with the amount of time it took to receive your payment from AEP Ohio, using the same scale from 0 to 10? [REPEAT SCALE IF NECESSARY]

0. 0 [VERY DISSATISFIED]

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY SATISFIED]
98. (Don't know)
99. (Refused)

G10a. [ASK IF G10=0, 1,2,3] Why did you rate it that way? (PROBE AND CLARIFY)

97 (OPEN END)
98 (Don't know)
99 (Refused)

G11. Thinking about your entire experience with the AEP Ohio Appliance Recycling Program, overall, how satisfied are you with the service, using the same scale from 0 to 10?

[REPEAT SCALE IF NECESSARY]

0. 0 [VERY DISSATISFIED]
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY SATISFIED]
98. (DON'T KNOW) – SKIP TO G13
99. (REFUSED) – SKIP TO G13

G11A. [ASK IF G11 ≥ 5] What aspects of the program did you particularly like? (DO NOT READ LIST) [MULTIPLE RESPONSE - ACCEPT 3]

01. (POSITIVE COMMENT ABOUT PICK-UP TEAM)
02. (THE SERVICE WAS EASY/DIDN'T HAVE TO DISPOSE OF APPLIANCE MYSELF)
03. (SHORT WAIT BETWEEN SIGNING UP AND PICK-UP)

04. (IT WAS FREE)
05. (THE $25 PAYMENT)
06. (LIKE THAT APPLIANCE WAS RECYCLED/HELPS THE ENVIRONMENT.)
97. (OTHER-SPECIFY)
96. (NONE OF IT/DIDN'T LIKE ANY OF IT)
98. (DON'T KNOW/NOT SURE)
99. (REFUSED)

G11B. [ASK IF G11 ≤5] What aspects of the program did you particularly dislike? (DO NOT READ LIST) [MULTIPLE RESPONSE - ACCEPT 3]

01. (PICK UP TEAM DID NOT ARRIVE ON TIME)
02. (OTHER NEGATIVE COMMENT ABOUT PICK-UP TEAM)
03. (HAD TO WAIT A LONG TIME TO GET APPOINTMENT)
04. (OTHER NEGATIVE COMMENT ABOUT SCHEDULING APPOINTMENT)
05. (SOMEONE HAD TO BE HOME FOR PICK-UP)
06. (REFUND WASN'T AS MUCH AS I WAS TOLD/FALSE ADVERTISING)
07. (TOOK TOO LONG TO RECEIVE PAYMENT; HAVEN'T RECEIVED PAYMENT YET)
97. (OTHER-SPECIFY)
96. (NONE OF IT/WAS SATISFIED WITH ALL)
98. (DON'T KNOW)
99. (REFUSED)

G13. Overall how satisfied are you with AEP Ohio, using the same scale from 0 to 10? [REPEAT SCALE IF NECESSARY]

0. 0 [VERY DISSATISFIED]
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 [VERY SATISFIED]
98. (DON'T KNOW)
99. (REFUSED)

G13a. [ASK IF G13=0,1,2,3] Why did you rate it that way? (PROVE AND CLARIFY)

97 (OPEN END)
98 (Don't know)

99 (Refused)

G14. Would you say participating in this program has made you feel more favorable, less favorable, or no different about AEP Ohio?

1. MORE FAVORABLE ABOUT AEP OHIO
2. LESS FAVORABLE ABOUT AEP OHIO
3. NO DIFFERENT ABOUT AEP OHIO
98. (DON'T KNOW)
99. (REFUSED)

G15. For how many years have you been an AEP Ohio customer at any location?

(NUMERIC OPEN END 1-99)

00. LESS THAN ONE YEAR
98. (DON'T KNOW)
99. (REFUSED)

G16. Based on your participation in the AEP Ohio Appliance Recycling Program, have you taken any additional actions to save energy in your home?

1. YES
2. NO
8. (DON'T KNOW)
9. (REFUSED)

G16a. [ASK G16a IF G16=1] What energy saving actions have you taken? (PROBE AND CLARIFY)

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

99. (Refused)

G16b. Since participating in the program, have you participated in any <u>other</u> AEP Ohio energy efficiency programs?

1 YES
2 NO
8 (DON'T KNOW)
9 (REFUSED)

G16c. [ASK IF G16b=1] Which other program(s) did you participate in? (PROBE AND CLARIFY)

97 (OPEN END)
98 (Don't know)
99 (Refused)

G16d. [ASK IF G16b=1] How did you hear about this/these program? (DO NOT READ) [MULTIPLE RESPONSE]

01. (RETAILER)
02. (INTERNET)
03. (BILL INSERT)
04. (FRIEND/RELATIVE/NEIGHBOR)
05. (AEP OHIO WEB SITE)
06. (MUNICIPAL WEB SITE OR MUNICIPAL NEWSLETTER)
07. (RADIO)
08. (NEWSPAPER)
97. (OTHER___)
98. (DON'T KNOW)
99. (REFUSED)

G17. Have you noticed a reduction in the amount of your electric bill since your appliance(s) was/were removed?

1. YES
2. NO
8. (DON'T KNOW)
9. (REFUSED)

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

H1. Do you own or rent your home?

1. OWN
2. RENT
8. (DON'T KNOW)
9. (REFUSED)

H2. [ASK IF H1 = 2] Do you pay your own electric bill or is it included in your rent?

1. PAY BILL
2. INCLUDED IN RENT
8. (DON'T KNOW)
9. (REFUSED)

H3. How many people live in your household year-round?

[NUMERIC OPEN END]
98. (DON'T KNOW)
99. (REFUSED)

H4. What is the age of the Head-of-the Household? (IF THE ROLE IS SHARED, PLEASE ASK THEM TO PROVIDE AN AVERAGE)

[NUMERIC OPEN END]
98. (DON'T KNOW)
99. (REFUSED)

H5. What is the approximate square footage of home that you live in?

[NUMERIC OPEN END]
99998. (DON'T KNOW)
99999. (REFUSED)

H5a. [ASK H5a IF H5 = DK] Is it... (READ LIST) [SINGLE PUNCH]

01. Less than 500 square feet
02. 500 to less than 1000 square feet
03. 1000 to less than 1500 square feet
04. 1500 to less than 2000 square feet
05. 2000 to less than 2500 square feet
06. 2500 to less than 3000 square feet
07. 3000 to less than 4000 square feet

08. 4000 to less than 5000 square feet
09. 5000 square feet or more
98. (DON'T KNOW)
99. (REFUSED)

H6. How long have you lived at your current residence?

[RECORD YEARS]
00. LESS THAN 1 YEAR
98. (DON'T KNOW)
99. (REFUSED)

H6a. 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)

H6b. [ASK IF H6a=1] 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)

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

1. $50,000-$75,000
2. $75,000-$100,000
3. Over $100,000
8. (DON'T KNOW)
9. (REFUSED)

H7. What is the highest level of education you have completed? (READ LIST)

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
97. (OTHER, SPECIFY)
98. (DON'T KNOW)
99. (REFUSED)

Thank you for your participation!

6.1.2 In-depth Interview Guides

AEP Program Staff Interview Guide: Appliance Recycling Program

Interview Objectives:

- Determine effectiveness of program design
- Determine effectiveness of marketing efforts
- Assess effectiveness/efficiency of program operations & delivery

Introduction

First we would like to give you some background about who we are and why we want to talk with you today. EMI is an independent consulting firm that works with electric and gas utilities to help ensure the attainment of energy efficiency goals.

We are part of the team hired to conduct an evaluation of AEP Ohio's energy efficiency programs, and we're currently in the process of conducting interviews with program managers and key staff in order to improve our understanding of those programs. At this time we are interested in asking you some questions about the Efficient Products program so that we can get your insights into what is working well and not working well with the program, from your perspective.

Before we get started, can you take a moment and explain your role and scope of responsibilities with respect to the Appliance Recycling Program? How long have you held this position?

Program Structure/Design

Can you please give an overall description of the purpose and scope of the Appliance Recycling Program?

- How does the program go about achieving this purpose?
- What are the major components of the program?
- When has the program roll-out? How did that go?

Do you feel like you have a good sense of how each program is going in terms of reaching its targets?

Outside of the quantitative goals (e.g., $, $/kWh, savings and participation rates), in your own words, what are the key goals and objectives of this program?

Is there an implementation plan or program operations manual that you can send me? Are there any documents that outline the roles and responsibilities of program staff? How can we arrange to obtain copies?

Has anything changed with respect to the structure or design of the program since it was first implemented? What and why?

Marketing/Outreach

Can you describe the different ways customers find out about this program?

- (bill inserts, online, TV, newspaper, radio, community events?)
- How often does each activity occur?
- Who is in charge of developing materials?
- Who is in charge of marketing activities?
- Is there a marketing plan or marketing log that you could provide to me?

Have marketing and outreach for the program been effective overall? Have things been going as planned? Why or why not?

- If interviewee reports any challenges, clarify nature of the challenges (not adhering to deadlines, quality not as expected), then ask:
  - What effect is this having on implementation?
  - What is being done about that? Do you think that will fix things?
- How effective do you feel these marketing efforts have been in getting customers involved in the program, both in general and for specific individual marketing channels (e.g. bill inserts vs. TV).
- Which strategies have worked well? Which ones have not worked as well as you expected?

Are you able to send to me copies of the marketing materials that have been developed for this program?

Implementation Contractor

Please describe the role of the implementation contractor, JACO, in this program?

- What are their responsibilities?
- Satisfied with their participation?

Can you describe the lines of coordination and communication with JACO? Who at AEP Ohio talks to whom at JACO, how often, what about, and how?

- Do you feel that roles and responsibilities are clearly defined?
- Are you able to get in touch with the right person at JACO when you need to?

How is that going in general? Do you feel like you're being consulted as necessary and kept informed of activities?

- [If interviewee reports any challenges, clarify nature, then ask:]

- What effects, if any, is this having on program progress?
- What is being done about that? Do you think that will fix things?
- Is there anything else you might do to make communication and coordination as good as possible?

Is there a clearly-defined process for resolving any issues that might arise with JACO?

Incentives

Do you have a sense of how customers perceive the level of incentives offered?

- How do you determine this?
- Do you feel the incentives are adequate to motivate customer participation?

In terms of days, what is the longest and shortest time it has taken for a customer to receive an incentive once an appliance has been picked up? What is the average time?

- (If large range) What accounts for the difference in check processing times?
- Have you received any feedback from customers on the time it took to receive the incentive?
- Do you have a requirement for the number of days it takes to mail out a payment?
  - If so, do you review this on a regular basis?

Program Tracking/Reporting

What program data is collected and how is it collected?

- Who tracks this info?
- How often?
- Who enters the data and how often?

What types of reports (a.k.a., dashboard reports/management reports) do you rely upon to fulfill your responsibilities?

- Are you able to ascertain AEP's status on meeting goals in the Efficient Products program using the data in this report?
- If you were not meeting the targets, do the reports provide information that might help you determine where potential problem areas might be?
- Is there information/data that you would like to see added to these reports?

Are these reports accurate and current?

- How often is info updated?
- How often do you receive updated reports?

- How confident do you feel in the accuracy of the database being used to track this data?

What quality control processes are in place to ensure the program tracking database is accurate?

- Please explain.

Are there additional types of reports or information that you would find beneficial?

- Please explain.

Internal Organization/Staffing

***What* other departments at AEP are involved in the back-office functions or delivery of program services?**

- Account Managers?
- Customer Service Reps?
- Manage Data? / Tracking Targets?

From your perspective, is the staffing adequate for this program to meet its goal?

- (If not adequate) What areas/functions do you feel are not adequately staffed?

If you had to ramp up this program, what would you differently with respect to internal organization and staffing level?

Looking Forward

Do you believe this program is on track to meet participation and savings goals?

Why/why not?

Are or were there any changes being considered?

- If so, why?
- If changes were considered, but not implemented, what were they and why were changes not made?
- Which aspects of the program are changing?

Program Strengths/Areas for Improvement

What would you say is working really well?

What would you most like to change?

Is there anything that seems to stand in the way of making those changes at this time?

Summary

It's important for us to review what he heard you say in terms of key obstacles and issues you believe exist with this program. [Summarize of key issues and observations].

- I heard you talk about X challenges to the programs [list the challenges reported]. Could you give a percentage to each of these that add up to 100% in terms of how detrimental they are to achieving the goals for the Appliance Recycling program?

Do you have anything to add? Is there anything I've forgotten to ask you about?

Finally, how do you feel you will benefit from our research, and what would you expect to see come out of this research to be truly valuable to you and your team?

Thank you very much for taking the time in assisting us with this evaluation. Your contribution is a very important part of the process. We might follow-up with you by phone later, if additional questions arise.

6.1.3 Implementation Contractor Interview Guide: Appliance Recycling

Interview Objectives:

- Assess effectiveness/efficiency of program operations & delivery
- Assess marketing effectiveness
- Assess customer barriers to participation

Introduction

First we would like to give you some background about who we are and why we want to talk with you today. EMI is an independent consulting firm that works with electric and gas utilities to review and improve program operations and delivery.

We are part of the team hired to conduct an evaluation of AEP Ohio's energy efficiency programs, and we're currently in the process of conducting interviews with program managers and key staff in order to improve our understanding of those programs. At this time we are interested in asking you some questions about the Appliance Recycling program so that we can get your insights into what is working well and not working well with the program, from your perspective.

Before we get started, can you take a moment and explain your role and scope of responsibilities with respect to AEP Ohio's Appliance Recycling Program? How long have you held this position?

Next, I'm going to ask you some questions about various aspects of the program.

Implementation Process

Please describe the customer signup and scheduling process

- Call center
  - If you were going to start from scratch, how would you have changed this aspect of the Appliance Recycling program?
- Online signup
  - If you were going to start from scratch, how would you have changed this aspect of the Appliance Recycling program?

Is there a confirmation call made to the customer?

- When does this occur?
  - If you were going to start from scratch, how would you have changed this aspect of the Appliance Recycling program?

Is there a day-of-pickup call made to the customer?

- If you were going to start from scratch, how would you have changed this aspect of the Appliance Recycling program?

How far out is scheduling typically?

- Does this scheduling seem to work for customers? Does it seem to be working for JACO?
- What prevents you from scheduling appointments sooner?

Describe pickup process

- Do you check to see if the appliance is running?
- If you were going to start over from scratch, how would you change the pickup process?

Has anything changed with respect to the implementation of the program since it first began?

- Are there changes you would have liked to make, but were not able for some reason?
  - What changes?
  - What prevented changes?

Incentives

What is the range of days that normally pass between pickup of an appliance and the mailing of the $25 check? What is the average number of days between appliance pickup and the mailing?

- Have you gotten any feedback from customers about this turnaround time?
- Anything preventing JACO from sending them sooner?

Do you feel the $25 incentive is adequate to motivate customer participation?

Barriers to Customer Participation

How often do eligible customers sign up but then drop out of the program?

- Why?
- Anything you do to try and minimize this?
- Do you track customers who sign up and then cancel?
  - Do you keep a log of why customers cancel?
  - Does JACO review customer cancellations on a regular basis?

- Is there anything else that could help minimize cancellations? Anything AEP Ohio can do to help?

[Ask 4.2 if interviewee does not mention timeframe of scheduling as a reason.]

Do you ever have eligible customers cancel because you can't come out sooner?

- How often does this happen?
- Is there anything that could help minimize that? Anything AEP Ohio can do to help?

What are the bottlenecks in the pick-up process? What, if anything, prevents JACO from picking up all appliances that are scheduled to be picked up?

- What happens if a customer misses an appointment?

Marketing

In your opinion, what are the primary reasons customers participate in this program?

- Do you have any ideas on how we could get more customers to participate?

Can you describe the different ways customers find out about this program?

- (bill inserts, TV, newspaper, radio, community events?)

Please describe the marketing and outreach activities that you are involved in.

- (TV, newspaper ads)
- How often does each activity occur?
- Who is in charge of developing materials?
- Who is in charge of marketing activities?

Do you feel the marketing and outreach activities are effective? Why or why not. What parts are/are not working? Have things been going as planned?

- If interviewee reports any challenges, clarify nature of the challenges (not adhering to deadlines, quality not as expected), then ask:
  - What effect is this having on implementation?
  - What is being done about that? Do you think that will fix things?
  - If you were starting from scratch, what changes would you have made to the marketing materials and allocation of resources to the various media outlets?

Are you able to send me (or direct me to) copies of the marketing materials that have been developed for this program?

Finally, how do you feel you will benefit from our research, and what would you expect to see come out of this research to be truly valuable to you and your team?

D

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AEP Ohio
Energy Efficiency/ Demand Response Plan
Plan Year 1 (1/1/2009-12/31/2009)
Evaluation Report: Low Income Energy Savings and Weatherization Kits

Presented to
AEP Ohio

March 9, 2010

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Table of Contents

Section 1. Introduction to the Program

1.1 *Program Description*

In program year 2009, (PY 2009) AEP Ohio — Ohio Power Company (OPCo) and Columbus Southern Power (CSP)—provided a program targeted to low income customers. This program consisted of providing Energy Savings and Weatherization Kits (Kits) which were distributed to clients of Community Action Program (CAP) agencies.

Each kit contained the following: two 13-watt spiral CFLs, two 23 Watt spiral CFLs, and one each of a LED nightlight, package of outlet and switch gaskets, closed cell foam weather-stripping, self-adhesive door sweep, hot water temperature gauge card, showerhead, roll of Teflon tape, flow meter bag, furnace filter alert whistle, refrigerator temperature gauge card, energy use gauge calculator, and energy conservation wheel.

Implementation Strategy

AEP Ohio purchased 22,000 weatherization kits from Niagara Conservation Corporation of Oak Knolls, NJ. CAP agencies received 20,000 kits with instructions to provide them to AEP Ohio customers who received Home Energy Assistance Program (HEAP) bill payment assistance. These kits were distributed between late November 2008 and early June 2009. AEP Ohio provided the remaining 2,000 kits to Ohio Energy Project that, in turn, trained teachers in an energy efficiency curriculum and provided the kits to the students for installation.

Section 2. Evaluation Methods

The impact evaluation of the Kit low income program for PY2009 was primarily a review of the distribution of the kits, energy savings algorithms, market research commissioned by AEP, and calculation of part-year savings.

2.1 *Program Savings*

Energy and demand (coincident peak and overall) savings resulting from the PY2009 Low Income Kits program were calculated using the following savings algorithms:

Total Savings per K

= Total kits distributed

* $\sum$ (Savings $_{Measure\ i}$ * Installation Rate $_{Measure i}$ x Retention Rate $_{Measure i}$)

Table 2.1 shows the data sources used to estimate the input parameters in the energy and demand savings algorithms for the Low Income Kits program. Each of these parameters is described in further detail below.

Table 2.1. Savings Parameter Data Sources

Savings Input Parameters	Low Income Kits Program
Kits Distributed to AEP Ohio Low Income Customers	AEP Ohio M&V Manager
Savings by Measure in Kits	Deemed Savings by Measure for Kits
Installation Rates and Retention Rates	Participant Phone Survey Conducted by Thoroughbred Research in August 2009[1]

Kits Distributed to AEP Ohio Low Income Customers

The number of kits to be counted for savings needs to be verified as being distributed to the target market customers, that is, low income customers of AEP Ohio. AEP Ohio reviewed the account data provided by CAP agencies to determine the number of accounts that were verified as AEP Ohio customer accounts.

[1] Source: AEP Ohio Energy Savings and Home Weatherization Kit Survey: Results Summary: Prepared by AEP Service Company, August 28, 2009.

Savings by Measure

As part of the development of the evaluation plan, each measure in the kits was assigned an expected savings value for energy and demand. The assumptions behind these estimates were reviewed for consistency with industry sources.

Installation and Retention Rates

In order for a kit measure to receive credit for energy savings to the Low Income program within a given program year, the measure must be installed within that program year. All surveyed customers were asked whether or not they had installed (and not since removed) all or a portion of the measures in the kits they were provided. Customer responses were used to calculate the PY 2009 installation and retention rates for the Low Income Kits program.

Part-Year Credit

Part-year credit was calculated to account for the fact that kits were distributed across several months and were not installed for the entire calendar year 2009. Kits were distributed from late November 2008 through early June 2009. Navigant Consulting assumes that measures are implemented within a month of receiving the kits and that equal numbers of ESKs are distributed each month. Table 2.2 below shows the part-year credit to apply for the savings from kits distributed to customers each month.

Table 2.2. Calculation of Part-Year Credit

Received Kits	Installed Measures	Number of Months	Part-Year Credit
Nov	Dec	12	1.00
Dec	Jan	12	1.00
Jan	Feb	11	0.92
Feb	Mar	10	0.83
Mar	Apr	9	0.75
Apr	May	8	0.67
May	Jun	7	0.58

Part-year credit

= $\sum$ (part-year credit by month)

* (Kits distributed to Low Income AEP Ohio Customers) / (7 months of program)

= 5.75 / 7 * # of kits = 0.82 * # of kits

2.2 *Data Sources*

Kits Measure Savings

Savings estimates (energy and demand) were calculated for each measure in the kits, which included CFLs, LED night light, weatherization measures such as weather-stripping, temperature gauges, and low-flow showerheads.

Staff Interview/Communications

Navigant Consulting conducted a phone interview with AEP Ohio staff responsible for the kits program evaluation, and received communications about validation of AEP Ohio accounts for kit participants, as well as program information.

Installation Survey

In August 2009, Thoroughbred Research Inc. completed a total of 352 telephone interviews with a representative random sample of AEP Ohio customers who had received the kits. The objective of the survey was to get a reliable estimate of the number of items of each measure in the kits that was actually installed and used. Thoroughbred Research received a database from AEP Ohio containing the 19,494 customers who had received kits. After cleaning the data for duplicate accounts, missing or bad telephone numbers and closed or final accounts, there were 15,054 usable records. Thoroughbred attempted to contact 1,161 customers and completed 352 interviews from a quota of 350 (a response rate of 30%). The survey did not distinguish between OPCo and CSP.

2.3 *Program Impact Parameter Estimates*

Table 2.3 shows estimates of energy and demand savings for each measure in the Energy Savings Kits which is expected to provide savings. Education and information measures such as the Energy Use Gauge Calculator are not expected to provide savings. More details on measure estimates are provided after the table.

Table 2.3. Energy Savings Estimates for Kits

Measure Category	Energy Conservation Kit Measures	Energy Savings (Annual kWh at Meter)	Peak Demand Savings (Net Annual kW at Meter)
Lighting	13 Watt Spiral CFL (2 Lamps)	80	0.006
	23 Watt Spiral CFL (2 Lamps)	93	0.007
	LED Nightlight	13	0.000
Weatherization	Weatherization Measures	35	0.053
Hot Water	Hot Water Temperature Gauge Card	45	0.000
	Earth Massage Showerhead	51	0.005
	TOTAL KIT SAVINGS	**317**	**0.071**

Lighting Measures

Savings and calculations for CFL savings were taken from the AEP Company Residential Master Measure List data file. AEP Ohio assumes a 60 W incandescent lamp is replaced by a 13 W CFL lamp and a 75 W incandescent lamp is replaced by a 23 W CFL lamp. Gas heating is assumed.

Savings for LED nightlights assume that an existing nightlight using 5 Watts[2] is replaced by the LED night light in the kit which consumes 0.3 Watts. Existing night lights consume from 5 to 7 Watts; 5 Watts is a conservative value. There are no demand savings; there is no coincidence with system peak.

Weatherization Measures

Weatherization measures include the package of outlet and switch gaskets, closed cell foam weather-stripping, and a self-adhesive door sweep. Savings from weatherization are estimated for a group of measures rather than individually, often assuming a percentage of savings for whole home energy use. Savings for a group of weatherization measures (caulk gun, clear silicone acrylic caulk, rope caulk, plastic storm window kits, insulated adhesive foam tape, switch and outlet foam gaskets, and safety plugs) were estimated for JEA (Jacksonville, Florida) as 191 kWh per household. This was used to estimate savings for the subset of measures installed in the AEP Ohio kit assuming 20% of weatherization measure savings would be

[2] Source: http://www.hardwareandtools.com/invt/u578995.

attributable to the weatherization measures included in the AEP Ohio kit or 35 kWh and 0.053 kW. Savings estimates assume gas heating.

Hot Water Measures

The hot water measures (temperature gauge card and showerheads) estimates assume electric water heating and are adjusted for the saturation of electric water heating in AEP Ohio territories, which is 34.2%. Showerhead savings are taken from the Master list and the hot water temperature gauge savings estimate was taken from the Efficiency Vermont Technical Reference Manual 2007. There is no peak savings assumed for the hot water temperature gauge because customers are not expected to reduce hot water use or change time of use.

Education and Information

There are no savings assumed for education and information measures which include the furnace filter alert whistle, refrigerator temperature gauge card, energy use gauge calculator, and energy conservation wheel.

2.4 *Program Impact Results*

This section describes the inputs to the impact analysis and the actual program impact.

Kits Distributed to AEP Ohio Low Income Customers

The CAP agencies reported distributing 19,494 kits to assistance applicants from November, 2008 through June, 2009. Table 2.4 shows the disposition of these kits.

Table 2.4. Verified Kits Distributed to AEP Ohio Low Income Customers

Activity	Number of Kits
AEP Distributed to CAP Agencies	20,000
CAP Distributed to Low Income Clients	19,494
No account Number	431
Not AEP Ohio Customers	57
No Match to AEP Account Number	4,481
Total Verified as Distributed to Target Market[3]	**14,525**
Columbus Southern Power	6,082
Ohio Power Company	8,443
Part-Year Credit (0.82 * 14,525)	**11,931**
Columbus Southern Power (0.82 * 6,082)	4,987
Ohio Power Company (0.82 * 8,443)	6,923

Installation and Retention Rates

Table 2.5 presents the installation and retention rates from the survey that are applied to each measure to determine adjusted energy savings per kits for each utility. Hot water measures (hot water temperature gauge card and Earth Massage Showerhead) are adjusted for electric hot water saturation of 34.2%. Saturations of 44% for gaskets, 57% for weatherstrip, and 54% for the door sweep were averaged for calculation of savings.

Table 2.5. Applying Installation/Retention Rates to Kits Measures

Kits Measure Description	Energy Savings (Annual kWh at Meter)	Peak Demand Savings (Net Annual kW at Meter)	Installation Rate	Retention Rate	Gross Energy Savings per Kit (kWh)	Gross Peak Demand Savings per Kit (kW)
13 Watt Spiral CFL (2 bulbs)	80.0	0.0060	83%	76%	50	0.004
23 Watt Spiral CFL (2 bulbs)	92.7	0.0071	78%	72%	52	0.004
LED Nightlight	12.98	0.0	76%	70%	7	0.000
Gaskets, Weatherstrip, Door Sweep	35.0	0.0530	52%		18	0.027
Hot Water Temperature Gauge Card	45.4	0.0	49%		22	0.000
Earth Massage Showerhead	51.3	0.0053	66%		34	0.003
TOTAL PER KIT	**317.3**	**0.071**			**184**	**0.011**

[3] The results from the AEP Ohio 2009 Performance Report showed a split of 42% of kits distributed to CSP and 58% to OPCo, and this split was used to allocate participation across the two utilities.

Based on the impact parameter estimates described in the previous section, Navigant Consulting was able to estimate the program impacts resulting from the PY 2009 Low Income Kits program for each utility. The results are provided in Table 2.6 below.

Table 2.6. Energy and Demand Savings by Utility (Full and Part-Year)

Utility	Full Year Savings		Part-Year Conversion	
	Energy (kWh)	Peak Demand (kW)	Energy (kWh)	Peak Demand (kW)
CSP	1,116,842	235	915,811	193
OPCo	1,397,717	327	1,146,128	268
AEP Ohio Total	**2,514,559**	**562**	**2,061,938**	**461**

2.5 *Cost Effectiveness Review*

This section addresses the cost effectiveness of the Kits program. Cost effectiveness is assessed through the use of the Total Resource Cost (TRC) test. Table 2.7 summarizes the unique inputs used in the TRC test. AEP Ohio shareholders funded the Kits program; therefore, in the cost-effectiveness analysis, only the cost of the kits is included. Administrative costs were not allocated to the program.

Table 2.7. Inputs to Cost-Effectiveness Model for Low Income Kits Program

Item	CSP	OPCo	Combined
Measure Life	6.6	6.6	-
Participants	6,082	8,443	14,525
Annual Energy Savings	1,116,842	1,551,379	2,668,221
Coincident Peak Savings	235	327	562
Third Party Implementation Costs	$0	$0	$0
Utility Administration Costs	$0	$0	$0
Utility Incentive Costs	$180,507	$249,921	$430,428
Participant Contribution to Incremental Measure Costs	$0	$0	$0

Based on these inputs, the TRC ratio for CSP is 2.5 and 2.5 for OPCo, and the program passes the TRC test in each utility. Table 2.8 summarizes the results of the cost-effectiveness tests. Results are presented for the Total Resource Cost test, the Ratepayer Impact test, and the Utility Cost test. Since the participants did not contribute to costs, the Participant Cost test is not applicable.

Table 2.8. Cost Effectiveness Results for Low Income Kits

Test Results for Kits	CSP	OPCo
Total Resource Cost	2.5	2.5
Participant Cost Test	N/A	N/A
Ratepayer Impact Measure	0.4	0.4
Utility Cost Test	2.5	2.5

At this time, additional benefits related to reduction of greenhouse gas emissions have not been quantified in the calculation of the TRC. These additional benefits would increase the given TRC benefit/cost ratio.

Section 3. Conclusions and Recommendations

This section highlights the findings and recommendations from the evaluation of the distribution of Energy Savings Kits to Low Income customers. The primary objectives of this evaluation were to quantify the energy and demand impacts resulting from energy saving measures distributed through the Low Income Kits program. Below are the key conclusions and recommendations.

3.1 *Conclusions*

Full year savings for the AEP Ohio Low Income Kits program are estimated at 2,514 MWh and 0.562 peak MW. Part-year savings are 2,062 MWh and 0.461 peak MW. Costs for the program were $412,000 (funded from shareholder dollars). The program is very cost-effective with a TRC ratio of over four for each utility. The Energy Savings and Weatherization Kit program provided robust energy and demand savings at a low cost.

3.2 *Recommendations*

AEP Ohio should consider offering the program again, as using CAP agencies to distribute kits is low cost and effective in the installation and retention of energy savings measures, which result in cost-effective energy and peak demand savings for a low income program.