

RECEIVED

FEB 14 2014

**PUBLIC SERVICE
COMMISSION**

COMMONWEALTH OF KENTUCKY

BEFORE THE

PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF

**APPLICATION OF KENTUCKY POWER COMPANY)
TO AMEND ITS DEMAND-SIDE MANAGEMENT)
PROGRAM AND FOR AUTHORITY TO IMPLEMENT)
A TARIFF TO RECOVER COSTS AND NET LOST)
REVENUES AND TO RECEIVE INCENTIVES)
ASSOCIATED WITH THE IMPLEMENTATION OF)
THE PROGRAMS)**

Case No. 2013-00487

**KENTUCKY POWER COMPANY RESPONSES TO
COMMISSION STAFF'S FIRST SET OF DATA REQUESTS**

February 14, 2014

VERIFICATION

The undersigned, Edgar J. Clayton, being duly sworn, deposes and says he is the Manager, Energy Efficiency & Consumer Programs for Kentucky Power, that he has personal knowledge of the matters set forth in the forgoing responses for which he is the identified witness and that the information contained therein is true and correct to the best of his information, knowledge, and belief

Edgar J. Clayton
Edgar J. Clayton

COMMONWEALTH OF KENTUCKY)
) CASE NO. 2013-00487
COUNTY OF BOYD)


Subscribed and sworn to before me, a Notary Public in and before said County and State, by Edgar J. Clayton, this the *4th* day of February, 2014.

Debra Leigh Jones
Notary Public #462811

My Commission Expires: *3-20-2016*

VERIFICATION

The undersigned, Ranie K. Wohnhas, being duly sworn, deposes and says he is the Managing Director Regulatory and Finance for Kentucky Power, that he has personal knowledge of the matters set forth in the forgoing responses for which he is the identified witness and that the information contained therein is true and correct to the best of his information, knowledge, and belief


Ranie K. Wohnhas

COMMONWEALTH OF KENTUCKY)
) Case No. 2013-00487
COUNTY OF FRANKLIN)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Ranie K. Wohnhas, this the 13th day of February 2014.

 48393
Notary Public

My Commission Expires. January 23, 2017

Kentucky Power Company

REQUEST

Refer to the cover letter ("Cover Letter") which states, "By this filing, the Company seeks authority to implement its revised electric tariff (P.S.C. Electric No. 9, Tariff D.S.M.C. 6th Revised Sheet No. 22-2) to recover its costs associated with its demand-side management programs, including net lost revenues and incentives related to the programs."

- a. Explain whether Kentucky Power's Demand-Side Management ("DSM") Collaborative ("Collaborative") supports this filing.
- b. Identify who attended the DSM Collaborative meeting when the Status Report and Exhibit C were discussed.
- c. State how those present at the DSM Collaborative voted, whether they supported, opposed or abstained as to the Status Report and Exhibit C.
- d. If they opposed or abstained, explain why.

RESPONSE

- a. Although there was no vote taken, there were no objections to the proposed DSM Status Report and Exhibit C initially presented on September 26, 2013, and subsequently revised and reviewed on a December 16, 2013 conference call. The KY Attorney General representative abstained.
- b. The following participated in the DSM Collaborative Conference Call on December 16, 2013:

Annie Thompson, LKLP
Bertha Daniels, Appalachian Research and Defense Fund of Kentucky, Inc.
Michael Moynahan, Community Action Kentucky
Rob Jones, Community Action Kentucky
Josh Shuffle, LKLP
EJ Clayton, Kentucky Power
Kenneth Borders, Kentucky Power
Scott Bishop, Kentucky Power
Ranie Wohnhas, Kentucky Power
Lila Munsey, Kentucky Power

- c. None of the Collaborative members objected to the proposed DSM filing.
- d. The Kentucky Attorney General representative could not attend the call, but provided an email noting her office had no specific questions concerning the proposed DSM filing and that it was abstaining.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to the cover letter which states, "Kentucky Power estimates the annual cost of the 2014 program to be \$4,115,956." Per the calculation of Commission Staff, based on the 2014 budget amounts from the Status Report, the 2014 program costs are \$4,029,706, or an \$86,250 difference. Confirm whether the \$86,250 difference is correct, and if so, explain the discrepancy.

RESPONSE

The difference can be explained by the fact that the Market Potential Study totaling \$80,000 and new School Energy Management program estimated at \$6,250 were not shown as individual program pages within the Status Report.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to the cover letter which states, "The Company also proposes a market potential study to support Kentucky Power strategy and resource deployment for DSM over a 10-year planning period." Also refer to the cover letter, which states, "The Market Potential Study is proposed as a General Administrative cost to the DSM Portfolio having an estimated expense of \$80,000. The allocation of total cost for the study includes 50% to residential and 50% to commercial customer sectors." Explain how the proposed allocation of the estimated expense of \$80,000 will be determined, considering that direct program costs for 2013 and 2014 are not 50 percent for residential programs and 50 percent for commercial programs.

RESPONSE

The evaluation company indicated that the evaluation services will be equally split between the two customer sectors, residential and commercial.

WITNESS: E J Clayton

RECEIVED

COMMONWEALTH OF KENTUCKY

AUG 24 2012

BEFORE THE PUBLIC SERVICE COMMISSION PUBLIC SERVICE
COMMISSION

In the Matter of:

The Application Of Kentucky Power Company)
To Amend Its Demand-Side Management)
Program And For Authority To Implement A)
Tariff To Recover Costs And Net Lost)
Revenues, And To Receive Incentives)
Associated With The Implementation)
Of The Programs)

RECEIVED

AUG 24 2012

PUBLIC SERVICE
COMMISSION
Case No. 2012-00367

Motion To Withdraw And Replace Application

Kentucky Power Company moves the Public Service Commission of Kentucky pursuant to 807 KAR 5:001, Section 3(5) for leave to withdraw the application it filed on August 15, 2012 in this proceeding, and in its place to substitute the redacted version of the application tendered with this motion. In support of this motion, Kentucky Power states:

1. On August 15, 2012, the Company filed its application in this proceeding seeking to amend its demand-side management program and also requesting related relief. The Application was placed online on August 16, 2012. Appended to the Application as Tab 5 was the July, 2012 evaluation report prepared by Applied Energy Group, Inc. ("AEG"). Tables 7, 8, and 9 (page 13), Figure 2 (page 14), and Table 11 (page 17) of the report disclose specific information concerning sales by the identified retailers of CFL bulbs. Tables 9 and 11 further provide the information by store.

2. This information is considered confidential and proprietary by the retailers providing the information. To Kentucky Power's knowledge, this information is not made public and the retailers take all reasonable efforts to protect the information from public

disclosure. It is Kentucky Power's understanding that such information may be used by competitors of the reporting retailers to gain an unfair competitive advantage.

3. The information for which confidential treatment is sought is used by AEG and the Company in connection with their internal review of the program and to gain a better understanding retailer performance and sales.

4. The memoranda of understanding between AEG and the retailers participating in the evaluation requires that the information for which confidential treatment is being sought be protected from public disclosure unless aggregated and without attribution to an identified retailer.

5. Because of a miscommunication between Kentucky Power and its vendor, Applied Energy Group, Inc., Kentucky Power was not informed of the confidential and proprietary nature of the information prior to filing the Application.

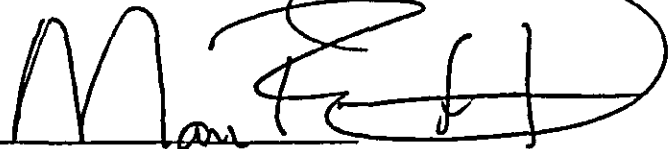
6. By a separate Petition, Kentucky Power is seeking confidential treatment of the information. In connection with that petition, Kentucky Power is filing under seal the pages of the report containing confidential information. Six public copies of the Application with the confidential information redacted are being filed in connection with this motion.

7. Failure to permit the withdrawal and return of the Application and the six copies filed on August 15, 2012 will undermine the Company's efforts to develop and evaluate demand-side management programs focused on the sale at retail of energy efficient devices. Retailers will be less likely to participate in such evaluations if their sales information, particularly on a store by store basis, is published.

Wherefore, Kentucky Power Company respectfully requests that the Commission issue
an Order:

- (1) Permitting Kentucky Power Company to withdraw the Application and six copies
filed on August 15, 2012 in this proceeding;
- (2) Removing from the Commission's website the version presently posted;
- (3) Allowing Kentucky Power to substitute the redacted copies of the Application
filed with this Application; and
- (4) Granting Kentucky Power such further relief to which it may appear entitled.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark Overstreet', is written over a horizontal line. The signature is stylized and somewhat cursive.

Mark R. Overstreet
STITES & HARBISON PLLC
421 West Main Street
P.O. Box 634
Frankfort, Kentucky 40602-0634
Telephone: (502) 223-3477
Facsimile: (502) 223-4387
moverstreet@stites.com



Kentucky Power
101A Enterprise Drive
P O Box 5190
Frankfort, KY 40602-5190
KentuckyPower.com

HAND-DELIVERED

Jeff R. Derouen, Executive Director
Kentucky Public Service Commission
P. O. Box 615
211 Sower Boulevard
Frankfort, KY 40602

RECEIVED

AUG 24 2012

**PUBLIC SERVICE
COMMISSION**

August 15, 2012

Re: In the Matter of: The Application Of Kentucky Power Company To Amend Its Demand-Side Management Program And For Authority To Implement A Tariff To Recover Costs And Net Lost Revenues, And To Receive Incentives Associated with the Implementation of the Programs, Case No. 2012-00367

Dear Mr. Derouen:

Pursuant to the Commission's Order dated May 22, 1996, please find enclosed an original and six copies of Kentucky Power Company's Status Report. The report describes the operation of the Company's Demand-Side Management Program.

By this filing, the Company seeks authority to implement its revised electric tariff (P.S.C. Electric No. 9, Tariff D.S.M.C. 5th Revised Sheet No. 22-2) to recover its costs associated with its demand-side management programs, including net lost revenues and incentives related to the programs. This increase reflects a larger overall program portfolio to capture additional energy and demand reduction opportunities, and is required to recover a \$508,711 under-collection during the first half of 2012. Four copies of the revised tariff are also enclosed.

The Company's revision of the DSM Adjustment Clause factor for the residential sector is based upon the following calculations:

- The proposed adjustment clause factor is the midpoint between the ceiling and the floor calculations as demonstrated on Exhibit C.
- The floor was calculated by dividing the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 2) by the adjusted estimated sector kWh sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 11).
- The ceiling was calculated by dividing the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 4) by the adjusted

Jeff R. Derouen
August 15, 2012
Page 2

estimated sector kWh sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 11).

For the commercial sector the following calculations were used in connection with the Company's revisions:

- The proposed adjustment clause factor is the midpoint between the ceiling and the floor calculations as demonstrated on Exhibit C.
- The floor was calculated by dividing the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 16) by the adjusted estimated sector kWh sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 24).
- The ceiling was calculated by dividing the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 18) by the adjusted estimated sector kWh sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 24).

As set out in the Status Report, the Company recommends revision of the original 2012 program forecast for two of the Company's programs: the Targeted Energy Efficiency program and the High Efficiency Heat Pump program. The other forecasts contained in the Status Report are consistent with expense and participant levels shown in the February 15, 2012 filing in Case 2012-00051.

The forecasted participant levels for the Targeted Energy Efficiency program were reduced because of uncertainty in Community Action funding. Forecasted participant levels for resistance heat replacement in the High Efficiency Heat Pump program were reduced slightly to reflect customer response to the program for the period January through June 2012.

The Company also requests extension of the following programs for three years beginning 2013:

- 1) Residential Efficient Products
- 2) HVAC Diagnostic and Tune-up
- 3) Commercial High Efficiency Heat Pump/Air Conditioner
- 4) Commercial Incentive

If the extension is granted, the Company will consider implementing various improvements in these programs as described in the section of the program evaluation reports labeled "Key Findings and Recommendations".

The Company also proposes to extend the Pilot Residential and Small Commercial Load Management Program through 2013. Extending the program will allow the Company to evaluate the program using more participants through a full winter and summer season.

Jeff R. Derouen
August 15, 2012
Page 3

The complete evaluation report will be subsequently filed with the Commission along with recommendations for this pilot program. As part of the program extension, the Company requests that the Commission approve the proposed revision to the existing Tariff R.C.L.M. to continue the program operation through 2013. Section four of the Status Report includes an evaluation of the process and market for this program. Four copies of revised Tariff R.C.L.M. also are enclosed.

In sum, the Company requests the Commission approve the following:

- (1) The DSM Status Report and Schedule C Report enclosed with this letter.
- (2) The five program evaluation reports included in the following subsections of the DSM Status Report:
 - Section 2.* Commercial Incentive
 - Section 3.* Residential and Small Commercial HVAC Diagnostic and Tune-Up
 - Section 4.* Residential and Small Commercial Load Management Pilot
 - Section 5.* Residential Efficient Products
 - Section 6.* Small Commercial Heat Pump/Air Conditioner Incentive
- (3) A three-year extension beginning 2013 for the Residential Efficient Products, HVAC Diagnostic and Tune-up, Commercial High Efficiency Heat Pump / Air Conditioner, and Commercial Incentive programs.
- (4) A one year extension of the Pilot Residential and Small Commercial Load Management program.
- (5) The P.S.C. Electric No. 9, Tariff R.C.L.M. (Pilot Residential and Small Commercial Load Management) 1st Revised Sheet Nos. 23-1 and 23-2 to become effective September 27, 2012.
- (6) The P.S.C. Electric No. 9, Tariff D.S.M.C. 5th Revised Sheet No. 22-2 to become effective September 27, 2012. This will allow the Company to utilize the new residential and commercial factors with the first billing cycle in October 2012.

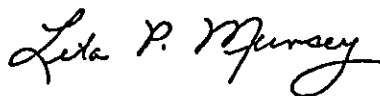
The Attorney General's representative abstained on all matters prior to leaving the meeting before the program recommendations were reviewed because of concerns that under the Collaborative's bylaws an abstention is treated as an affirmative vote. The Attorney General's representative did not approve the proposed DSM Status Report, Schedule C, or the Company's proposed revisions to the tariffs. The Company's proposed revision of the DSM Adjustment Clause factor for residential customers is supported by the Company's DSM Collaborative with the exception of the representatives of Northeast Kentucky Community Action ("NKCA") and Big Sandy Area Development District ("BSADD"), (see Exhibit C, Column 4, Line 13). The

Jeff R. Derouen
August 15, 2012
Page 4

representatives of the BSADD and NKCA objected to the increased rates for residential customers required under the revised tariff, but otherwise supported the Company's recommendations. The revised DSM Adjustment clause factor for the commercial sector has been agreed upon and is proposed by the DSM Collaborative with exception of the Office of Attorney General (see Exhibit C, Column 4, Line 26).

As is customary, the Company requests the Commission return a stamped copy of the revised tariff sheet upon arrival. If you have any questions, please contact me at (502) 696-7010.

Sincerely,



Lila P. Munsey
Manager, Regulatory Services

enclosure

KENTUCKY POWER COMPANY

Canceling 5th Revised Sheet No 22-2
4th Revised Sheet No 22-2

P.S.C. ELECTRIC NO 9

TARIFF D.S.M.C.
(DEMAND-SIDE MANAGEMENT ADJUSTMENT CLAUSE) (Cont'd)

RATE. (Cont'd)

- 5 The DSM adjustment shall be filed with the Commission ten (10) days before it is scheduled to go into effect, along with all the necessary supporting data to justify the amount of the adjustments, which shall include data and information as may be required by the Commission
- 6 Copies of all documents required to be filed with the Commission under this regulation shall be open and made available for public inspection at the office of the Public Service Commission pursuant to the provisions of KRS 61.870 to 61.884.
- 7 The resulting range for each customer sector per KWH during the three-year Experimental Demand-Side Management Plan is as follows:

CUSTOMER SECTOR

	<u>RESIDENTIAL</u> (\$ Per KWH)	<u>COMMERCIAL</u> (\$ Per KWH)	<u>INDUSTRIAL*</u>
Floor Factor =	0.001394	(0.000453)	- 0 -
Ceiling Factor =	0.002677	0.002242	- 0 -

(I) (R)
(I) (I)

- 8 The DSM Adjustment Clause factor (\$ Per KWH) for each customer sector which fall within the range defined in Item 7 above is as follows:

CUSTOMER SECTOR

	<u>RESIDENTIAL</u>	<u>COMMERCIAL</u>	<u>INDUSTRIAL*</u>
DSM (c)	1,263,159	318,523	- 0 -
\$ (c)	620,412,000	315,891,200	- 0 -
Adjustment Factor \$	0.002036	0.000895	- 0 -

(R) (R)
(R) (R)

(I) (I)

* The Industrial Sector has been discontinued pursuant to the Commission's Order dated September 28, 1999

DATE OF ISSUE August 15, 2012 EFFECTIVE DATE Service rendered on or after September 27, 2012

ISSUED BY MICHAEL G. POLLEY PRESIDENT/COO FRANKFORT, KENTUCKY
 NAME TITLE ADDRESS

Issued by authority of an Order of the Public Service Commission in Case No. 2012-XXXX dated

KENTUCKY POWER COMPANY

Canceling

1st Revised Sheet No. 23-1
 Original Sheet No. 23-1

P S C ELECTRIC NO 9

R.C.L.M.
(Pilot Residential and Small Commercial Load Management)

AVAILABILITY OF SERVICE.

Available on a voluntary basis to individual residential customers and small commercial customers receiving retail electric service from the Company. Small commercial customers are defined as commercial electric service accounts having a metered peak demand of 100kW or less during the past 12 billing periods. Availability is limited to the first 200 residential and 25 small commercial customers applying for service under this tariff or until 450 load control devices have been installed. This tariff will be in effect once the Company has successfully launched its Residential and Small Commercial Load Management Pilot program and will continue through December 31, 2013. Enrollment to participate in R.C.L.M. will end on February 28, 2013

(T)
 (T)
 (T)

For non-owner occupied residence or facility, the Company will require written permission from the owner to install load control and communication equipment.

PROGRAM DESCRIPTION.

R.C.L.M. seeks to reduce peak demand through certain load management measures to assist in lowering costs and delaying future generating requirements. To participate, customers must allow the Company, or its authorized agents, to install load control equipment and, if necessary, auxiliary communicating devices to control the customer's central air conditioning, heat pumps, and/or electric water heating equipment. All such devices shall be installed at a time that is consistent with the orderly and efficient deployment of this program.

The Company will utilize the installed control devices to reduce customer's energy use during load management events. The Company plans to control devices for up to 150 hours per year (combined planned load management and emergency load management) with no single event lasting more than six (6) consecutive hours.

Cycling of the central air conditioning and heat pump systems or thermostat setback may be employed during load management events in the summer season. Water heating equipment may be cycled or turned off during load management events in both summer and winter seasons.

Company planned load management events shall not exceed six (6) consecutive hours per day during the summer months and four (4) consecutive hours per event during the winter months. Such non-emergency load management events shall not exceed 15 events and shall occur only during the months and hours listed below:

Season	Months	Applicable Hours
Summer	June through September	Noon to 8 P.M.
Winter	November through February	7 A.M. to 11 A.M. 6 P.M. to 10 P.M.

For emergency purposes, load management events shall not exceed 10 events per PJM planning year (June – May) and not last longer than six (6) hours duration. Emergencies shall be determined by PJM as defined in PJM Manual 13 – Emergency Operations. Emergency load management events can only occur between Noon and 8 pm on weekdays during June through September

(Cont'd on Sheet No. 23-2)

DATE OF ISSUE August 15, 2012 EFFECTIVE DATE Service rendered on or after September 27, 2012

ISSUED BY GREGORY G PAULEY, PRESIDENT/COO FRANKFORT, KENTUCKY
 NAME TITLE ADDRESS

Issued by authority of an Order of the Public Service Commission in Case No. 2012-XXXX dated

KENTUCKY POWER COMPANY

Canceling

1st Revised
Original

Sheet No. 23-2
Sheet No. 23-2

Attachment 3
Page 10 of 355

P S C ELECTRIC NO. 9

R.C.L.M. (Cont'd)
(Pilot Residential and Small Commercial Load Management)

RATE CREDIT.

Residential and Small Commercial customers shall receive the following monthly billing credits for each qualifying central air conditioning and heat pump unit controlled during the summer billing months of June to September:

\$20 00 per year (\$5.00 for each summer month; June, July, August, and September)

Residential and Small Commercial customers shall receive \$1 per month billing credit for each qualifying electric water heater unit controlled during the summer billing months of June, July, August and September and the winter billing months of November, December, January and February.

Such credits shall not reduce the customer's bill below the minimum charge as specified in the tariff under which the customer takes service.

EQUIPMENT.

The Company, or its authorized agents, will furnish and install, in the customer's presence, load control equipment and, if necessary, an auxiliary communicating device inside the customer's residence or facility. Ownership of the programmable communicating thermostat will be transferred to the property owner upon installation. All other load management equipment will be owned and maintained by the Company, or its authorized agents, until such time as the experimental load management pilot program is discontinued or the customer requests to be removed from the program after completing the initial mandatory period of one (1) year. At that time, and at the Companies discretion, some or all of the load control equipment and any auxiliary communicating device may be removed by the Company, or its authorized agents. The customer is not required to pay a deposit for any auxiliary communicating equipment. However, failure to return the auxiliary communicating device in good working order may result in additional charges in the amount of the current cost of the auxiliary equipment.

(T)
(T)

Should the customer lose or damage the load control devices or auxiliary communicating equipment, the customer will be responsible for the cost of repairing or replacing the device(s). If the device(s) malfunctions through no fault of the customer, the Company will replace or repair at its expense.

CONTRACT.

Participating customers must agree to participate for an initial period of one (1) year and thereafter may discontinue participation by telephone.

(Cont'd on Sheet No. 23-3)

DATE OF ISSUE August 15, 2012 EFFECTIVE DATE Service rendered on or after September 27, 2012

ISSUED BY GREGORY O BAULEY PRESIDENT/COO FRANKFORT, KENTUCKY
NAME TITLE ADDRESS

Issued by authority of an Order of the Public Service Commission in Case No. 2012-XXXX dated

KENTUCKY POWER COMPANY
Demand Side Management
Status Report
As of June 30, 2012

INDEX

PAGE	DESCRIPTION
1	Definitions
2	Summary Information (All Programs)
3	Summary Energy/Demand Information (All Programs)
<u>DSM Programs:</u>	
<u>Residential Programs</u>	
4	Targeted Energy Efficiency
5	High Efficiency Heat Pump - Mobile Home
6	Mobile Home New Construction
7	Modified Energy Fitness Program
8	High Efficiency Heat Pump
9	Community Outreach Compact Fluorescent Lamp (CFL)
10	Energy Education for Students
11	Residential HVAC Diagnostic and Tune-up
12	Pilot Residential Load Management
13	Residential Efficient Products
14	Energy Fitness - Inactive
15	Compact Fluorescent Bulb - Inactive
16	High Efficiency Heat Pump Retrofit - Inactive
<u>Commercial Programs</u>	
17	Commercial HVAC Diagnostic and Tune-up
18	Pilot Commercial Load Management
19	High Efficiency Heat Pump/Air Conditioner
20	Commercial Incentive
21	Smart Audit - Inactive
22	Smart Incentive - Inactive
<u>Industrial Programs</u>	
23	Smart Audit - Inactive
24	Smart Incentive - Inactive

DEFINITIONS

- 1) YTD Costs - Year-to-Date costs recorded through June 30, 2012.
- 2) YTD Impacts - Estimated in place load impacts for Year-to-Date participants.
- 3) PTD Costs - Costs recorded from the inception of the program through June 30, 2012
- 4) PTD Impacts - Estimated in place load impacts for Program-to-Date participants.

COMMENTS

Our calculations are based on actual participants and costs as of June 30, 2012. The Residential DSM costs in this status report do not agree with the total costs in the Financial Report due to a one month lag in reporting.

The estimated actual in-place energy (kWh) savings is the summation of the monthly average net energy savings associated with participating customers of each DSM program (including T&D losses). The average monthly net energy savings is the product of 1/12 of the annual kWh per participant (shown in Exhibit E) and 1/2 of the new participants for the current month, plus the cumulative participants from the previous months. The average monthly net energy savings is then increased by 10% to include T&D losses. The estimated actual in-place energy (kWh) savings are calculated in accordance with the Sunset Provision contained in the joint application, filed September 27, 1995.

The estimated anticipated peak demand (kW) reduction is a product of the number of net participating customers (excluding free riders) and projected winter/summer demand reductions filed for each program (refer to Section III to V of the joint application). The anticipated peak demand (kW) reductions includes 11% T&D loss savings.

The calculation of YTD and PTD estimated in place energy (kWh) savings and anticipated peak demand (kW) reductions contained in this status report reflect, wherever applicable, the program evaluation results of each individual program as described in the August 16, 1999, June 30, 2002, June 30, 2005, June 30, 2008, June 30, 2010, August 15, 2011 and August 15, 2012 DSM collaborative report.

The individual DSM lost revenue, efficiency incentive and maximizing incentives as of June 30, 1997 are calculated based on the initial values from Exhibit E in the joint application, filed September 27, 1995. A retroactive adjustment of the initial values of the efficiency incentives and net lost revenue KWH impacts was used for each program for the first eighteen months (1/1/96 to 6/30/97). The lost revenue, efficiency incentive and maximizing incentive for the period 1/1/2012 to 12/31/2012 are calculated using the revised values contained in Schedule C of this status report.

The program lost revenue is the product of the number of participating customers, the average net energy savings (kWh) per customer and the net lost revenue (\$/kWh). The number of participating customers is equal to 1/2 of the new participants for the current month, plus the cumulative participants from the previous months. The program-to-date lost revenues are calculated in accordance with the Sunset Provision contained in the joint application, filed September 27, 1995.

The efficiency incentive is the product of the number of participants for the month and the efficiency rate (\$/participant). The maximizing incentive is calculated as 5% of actual program cost for the month.

KENTUCKY POWER COMPANY
SUMMARY INFORMATION (ALL PROGRAMS)
As of June 30, 2012

DESCRIPTION	YTD	PTD
Total Revenue Collected	<u>\$3,350,222</u>	<u>\$20,295,335</u>
Total Program Costs	1,359,722	15,312,436
Total Lost Revenues	311,708	4,830,158
Total Efficiency / Maximizing Incentive	152,295	1,821,554
HEAP - Kentucky Power's Information Technology Implementation Costs (Case No 2006 - 00373, Dated December 14, 2006)	0	58,968
HEAP - KACA's Information Technology Implementation Costs	<u>0</u>	<u>15,700</u>
Total DSM Costs As of June 30, 2012	<u>\$1,823,725</u>	<u>\$22,038,816</u>

KENTUCKY POWER COMPANY
SUMMARY INFORMATION (ALL PROGRAMS)
 As of June 30, 2012

DESCRIPTION	YTD		PTD	
Actual In-Place Energy Savings:	1,246,032	kWh	588,659,979	kWh
w/ T&D Line Losses:	1,370,636	kWh	647,525,977	kWh
Total kW Reductions:				
Winter	932	kW	26,670	kW
w/ T&D Line Losses:	1,035	kW	29,604	kW
Summer	551	kW	6,607	kW
w/ T&D Line Losses:	612	kW	7,334	kW

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM	Targeted Energy Efficiency
PARTICIPANT DEFINITION	Number of Households
CUSTOMER SECTOR	Residential - Low Income
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	All Electric	Non All Electric
Jan	20	1
Feb	29	4
Mar	27	1
Apr	20	2
May	19	3
Jun	27	2
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	142	13
PTD	3,483	1,092

Impacts	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	79,850	89,795,611
Anticipated Peak Demand (kW) Reduction:		
Summer	42	777
Winter	72	3,142

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Description			
Total Evaluation	0 00	0 00	273,684 00
Equipment/Vendor	173,271 00	0 00	3,806,183 00
Promotional:	0 00	0 00	0 00
Customer Incentives	0 00	0 00	0 00
Other Costs	0 00	0 00	9,553 00
Total Program Costs	173,271.00	0.00	3,889,420.00
Lost Revenue:			
Efficiency Incentive:	52,258 00	1,944.00	815,309.00
Maximizing Incentive:	15,221 00	184 00	135,856 00
Maximizing Incentive:	88 90	0 00	123,438.00
Total Costs	240,818 00	2,128 00	4,964,121 00

COMMENTS:

The Targeted Energy Efficiency Program provides a variety of services, including a home energy audit, weatherization and seal-up to targeted low income customers

The Equipment / Vendor cost categories includes the cost of labor and materials of measures installed, participant energy education costs and vendor administration costs. The YTD costs are \$171,959 for all-electric and \$1,312 for non-all-electric homes.

The YTD Estimated in Place Energy (kWh) Savings for all-electric participants and non-all-electric participants is 78,970 and 2,880 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for all-electric and non-all-electric participants is 39/70 and 3/2 respectively.

The YTD Lost Revenue for all-electric participants and non-all-electric participants is \$48,115 and \$4,143 respectively.

The YTD Efficiency incentive for all-electric participants is \$15,221.
 The YTD Maximizing Incentive for non-all-electric participants is \$68

The participant and expense forecast for 2012 is 275 all-electric homes, 25 non-all-electric homes and \$303,300

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM	High Efficiency Heat Pump - Mobile Home
PARTICIPANT DEFINITION	Number of Units Installed
CUSTOMER SECTOR	Residential
REPORTING PERIOD	January 1, 2012 - June 30, 2012

New Participants	
Jan	10
Feb	11
Mar	16
Apr	35
May	26
Jun	12
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	110
PTD	2,598

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	74,000	87,599,200
Anticipated Peak Demand (kW) Reduction:		
Summer	52	491
Winter	87	4,179

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	0 00	0 00	52,558 00
Equipment/Vendor:	5,850 00	0 00	81,205 00
Promotional:	0 00	8 08	0 00
Customer Incentives:	48,800 80	8 08	1,102,800 00
Other Costs:	0 00	0 80	1,187 00
Total Program Costs	52,650 00	0 08	1,237,728.80
Lost Revenues:	32,886.00	5,820 08	570,028.00
Efficiency Incentive:	25,043 00	19,331 88	272,857.00
Maximizing Incentive:	0 80	8 00	0 00
Total Costs	111,281.00	24,151 80	2,880,313 80

COMMENTS:

The High Efficiency Heat Pump - Mobile Home program provides incentives to customers, encouraging them to install the highest efficiency equipment practical

The participant and expense forecast for 2012 is 210 and \$94,500 respectively

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	Mobile Home New Construction
PARTICIPANT DEFINITION.	Number of Units Installed
CUSTOMER SECTOR.	Residential
REPORTING PERIOD.	January 1, 2012 - June 30, 2012

New Participants			
	<u>Heat Pump</u>	<u>Air Conditioner</u>	
Jan	8	0	
Feb	8	0	
Mar	13	0	
Apr	13	0	
May	15	0	
Jun	22	0	
Jul	0	0	
Aug	0	0	
Sep	0	0	
Oct	0	0	
Nov	0	0	
Dec	0	0	
YTD	79	0	
PTD	2,384	2	

Impacts			
	<u>Year-To-Date</u>	<u>Program-To-Date</u>	
Estimated in Place Energy (kWh) Savings	55,840	128,218,400	
Anticipated Peak Demand (kW) Reduction:			
Summer	35	718	
Winter	8	5,138	

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0 00	0 00	36,529 00
Equipment/Vendor:	3,850 00	0 00	141,713 00
Promotional:	0 00	0 00	3,939 00
Customer Incentives:	39,500 00	0 00	1,198,950 00
Other Costs:	0 00	0 00	4,866 00
Total Program Costs	43,450.00	0 00	1,385,997.00
Lost Revenues:	27,001.00	0 00	616,041.00
Efficiency Incentive:	8,664 00	0.00	179,373.00
Maximizing Incentive:	0.00	0 00	2,580 00
Total Costs	77,905 00	0 00	2,192,991 00

COMMENTS:

The Collaborative has devised and implemented a plan in conjunction with trade allies to offer a financial incentive to new mobile home buyers and trade allies to encourage the installation of high efficiency heat pumps and upgraded insulation packages in new mobile homes

The participant end expense forecast for 2012 is 180 heat pumps and \$104,750 respectively

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Modified Energy Fitness
PARTICIPANT DEFINITION:	Number of Home Audits
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	
Jan	98
Feb	109
Mar	99
Apr	110
May	120
Jun	110
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
<hr/>	
YTD	646
PTD	8,837

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	106	82,127,889
Anticipated Peak Demand (kW) Reduction:		
Summer	-19	999
Winter	149	4,538

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0 00	0 00	36,328 00
Equipment/Vendor:	208,408 00	0 00	3,185,472 00
Promotional:	0 00	0 00	0 00
Customer Incentives:	0 00	0 00	0 00
Other Costs:	0 00	0 00	0 00
Total Program Costs	208,408 00	0 00	3,221,800 00
<hr/>			
Lost Revenues:	61,763.00	0.00	798,318.00
Efficiency Incentive:	4,115.00	0 00	312,258.00
Maximizing Incentive:	0 00	0.00	0.00
Total Costs	274,286 00	0 00	4,332,374 00

COMMENTS:

The Modified Energy Fitness program provides energy audits, blower door testing, duct sealing and direct installation of low cost conservation measures to residential customers with electric space heating and electric water heating

The equipment / vendor cost category includes the cost of labor and materials of measures installed, the cost of promotion by the vendor and vendor administration costs including customer education

The participants and expense forecast for 2012 is 1,216 and \$427,000 respectively

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	High Efficiency Heat Pumps
PARTICIPANT DEFINITION.	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	Resistance	Non-Resistance
Jan	18	32
Feb	15	22
Mar	10	41
Apr	17	42
May	18	39
Jun	10	41
Jui	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	88	217
PTD	706	1,349

Impacts	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	152,390	2,350,379
Anticipated Peak Demand (kW) Reduction:		
Summer	(17)	120
Winter	175	2,062

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0 00	0 00	12,236 00
Equipment/Vendor:	15,700 00	0 00	127,300 00
Promotional:	0 00	0 00	0 00
Customer Incentives:	125,800 00	0 00	789,700 00
Other Costs:	0 00	0 00	0 00
Total Program Costs	141,300 00	0.00	929,236 00
Last Revenue:	26,437.08	0.00	162,948 00
Efficiency Incentive:	22,678 00	0 00	258,089 00
Maximizing Incentive:	0.00	0.00	17,177 00
Total Costs	190,413 00	0 00	1,365,450 00

COMMENTS:

This program was implemented to reduce residential electric consumption by replacing older, less efficient electric heating systems with high efficiency heat pumps. Customers are provided an incentive encouraging them to promote the highest efficiency equipment practical.

The YTD Estimated In Place Energy (kWh) Savings for resistance heat replacement and non-resistance heat replacement participants is 27,420 and 124,970, respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for resistance heat replacement and non-resistance heat replacement participants is -13/48 and -4/127 respectively.

The YTD Lost Revenue for resistance heat replacement and non-resistance heat replacement participants is \$8,008 and \$18,431 respectively.

The Efficiency Incentive for resistance heat replacement participants is \$3,458 and for the non-resistance heat replacement participants is \$19,218.

The participant and expense forecast for 2012 is 175 resistance heat replacement customers, 475 non-resistance heat replacement customers and \$292,500 respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	Community Outreach Compact Fluorescent Lamp
PARTICIPANT DEFINITION.	Number of Customers
CUSTOMER SECTOR.	Residential
REPORTING PERIOD.	January 1, 2012 - June 30, 2012

New Participants	
Jan	0
Feb	1
Mar	471
Apr	0
May	1,476
Jun	387
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	2,335
PTD	15,804

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	174,100	1,176,623
Anticipated Peak Demand (kW) Reduction:		
Summer	112	407
Winter	105	589

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0 00	0 00	18,415 60
Equipment/Vendor:	22,439 00	0 00	137,053 48
Promotional:	175 00	0 00	16,104 36
Administration:	0 00	0 00	1,808 14
Other Costs:	0 00	0 00	0 00
Total Program Costs	22,614 00	0.00	173,381 80
Lost Revenues:	42,420 00	0 00	110,835 00
Efficiency Incentive:	11,138.00	0.00	73,095.00
Maximizing Incentive:	0 00	0 00	0.00
Total Costs	76,172 00	0.00	367,311 60

COMMENTS:

The Community Outreach Compact Fluorescent Lighting (CFL) program is designed to educate and influence residential customers to purchase and use compact fluorescent lighting in their homes. A package of 4 high efficiency CFLs are distributed to customers at scheduled community outreach events.

The participant and expense forecast for 2012 is 4,800 customers and \$58,500, respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM	Energy Education For Students
PARTICIPANT DEFINITION.	Number of Students
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	
Jan	0
Feb	0
Mar	275
Apr	0
May	250
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	525
PTD	5,098

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	38,340	323,943
Anticipated Peak Demand (kW) Reduction:		
Summer	41	157
Winter	25	150

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	10,281.00
Equipment/Vendor:	8,985.00	0.00	50,111.00
Promotional:	250.00	0.00	250.00
Education Workshops	0.00	0.00	13,000.00
Administration	0.00	0.00	7,562.00
Total Program Costs	9,245.00	0.00	81,184.00
Lost Revenues:	16,932.00	0.00	38,685.00
Efficiency Incentive:	1,684.00	0.00	16,256.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	27,841.00	0.00	138,128.00

COMMENTS:

The Energy Education for Students program is designed to partner with the National Energy Education Development Project (NEED) to implement an energy education program for 7th grade students at participating middle schools. The students will be provided a package of four 23 watt CFLs to install in their homes. The program will influence residential customers to purchase and use compact fluorescent lighting in their homes.

The participant and expense forecast for 2012 is 2,000 students and \$31,700.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Residential HVAC Diagnostic and Tune-up
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants		
	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	67	14
Feb	22	11
Mar	23	6
Apr	46	21
May	66	56
Jun	100	39
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	324	147
PTD	1,082	379

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	38,340	310,154
Anticipated Peak Demand (kW) Reduction:		
Summer	19	205
Winter	56	240

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	10,838.00	0.00	15,394.00
Equipment/Vendor	21,350.00	0.00	66,150.00
Promotional:	0.00	0.00	4,818.00
Customer Incentives:	21,350.00	0.00	88,050.00
Administration:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	53,338.88	0.00	158,412.00
Lost Revenue:	3,876.00	1,944.00	9,412.00
Efficiency Incentive:	6.00	184.80	8,930.90
Maximizing Incentive:	2,667.00	0.00	2,667.08
Total Costs	59,561.88	2,128.80	177,421.00

COMMENTS:

The Residential HVAC Diagnostic and Tune-up Program provides incentives to customers for a variety of HVAC services including over and under refrigerant charge and other diagnostic performance checks on residential unitary central air conditioning and heat pump units.

The YTD Estimated In Place Energy (kWh) Savings for heat pump and air conditioner participants is 34,830 and 3,510 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for heat pump and air conditioner participants is 13/56 and 6/0 respectively.

The YTD Lost Revenue for heat pump and air conditioner participants is \$3,430 and \$248 respectively.

The Maximizing Incentive for heat pump participants is \$1,771 and for air conditioner participants is \$890.

The participant and expense forecast for 2012 is 250 central air conditioners and 750 heat pumps and \$121,260 respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Pilot Residential Load Management
PARTICIPANT DEFINITION:	Number of Switches Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	A/C Switches	Water Heater SW
Jan	0	0
Feb	8	8
Mar	13	10
Apr	0	0
May	12	12
Jun	3	2
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	36	32
PTD	42	36

Impacts	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	15,874.96	0.00	24,467.99
Equipment/Vendor:	75,290.65	0.00	189,985.65
Promotional:	12,141.48	0.00	12,141.49
Customer Incentives:	18.00	0.00	18.00
Other Costs:	668.81	0.00	668.81
Total Program Costs	103,793.94	0.00	207,291.84
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	103,793.94	0.00	207,291.84

COMMENTS:

The Pilot Residential Load Management Program will determine whether peak demand can be effectively reduced through the installation of load control devices on central air conditioners, heat pumps, and/or electric water heaters.

The participant and expense forecast for 2012 is 110 air conditioners or heat pumps switches and 108 water heating switches at \$267,060. Other cost included above is for tax on equipment.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Residential Efficient Products
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	CFL	Specialty Bulbs	LED Lights
Jan	11,783	0	0
Feb	18,998	0	0
Mar	8,057	0	0
Apr	5,377	0	0
May	3,779	0	0
Jun	5,487	0	0
Jul	0	0	0
Aug	0	0	0
Sep	0	0	0
Oct	0	0	0
Nov	0	0	0
Dec	0	0	0
YTD	61,481	0	0
PTD	185,173	0	0

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	691,230	2,922,558
Anticipated Peak Demand (kW) Reduction:		
Summer	244	392
Winter	244	1,728

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	19,877.00	0.00	25,945.00
Equipment/Vendor:	84,142.00	0.00	287,854.00
Promotional	0.00	0.00	0.00
Customer Incentives:	55,156.00	0.00	189,531.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	169,175.00	0.00	483,330.00
Lost Revenues:	43,122.80	0.00	76,827.80
Efficiency Incentive:	43,759.00	0.00	85,204.00
Maximizing Incentive:	30.00	0.00	30.00
Total Costs	256,086.80	0.00	645,391.00

COMMENTS:

The Residential Efficient Products Program will provide incentive and marketing support through retailers to build market share and usage of ENERGY STAR lighting products. Designed to produce long-term energy savings in the residential sector by increasing the market share of ENERGY STAR CFLs and (or) other ENERGY STAR lighting products.

The participant and expense forecast for 2012 is 134,257 ENERGY STAR CFLs and 800 other lighting products and \$345,320 respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Energy Fitness - Inactive
PARTICIPANT DEFINITION:	Number of Households
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jui	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	2,812

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	0	55,360,221
Anticipated Peak Demand (kW) Reduction:		
Summer	0	441
Winter	0	1,932

Costs			
	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0 00	0 00	18,189 00
Equipment/Vendor:	0 00	0 00	665,964 90
Promotional:	0 00	0 00	0 00
Customer Incentives:	0 00	0 00	0 00
Other Costs:	0 00	0 00	960 00
Total Program Costs	9.00	0.00	685,113 00
Lost Revenues:	0 00	(19,322.00)	363,029.00
Efficiency Incentive:	0.00	(46,349 00)	63,482 00
Maximizing Incentive:	0 00	0 00	0 00
Total Costs	0 00	(65,671.00)	1,111,624 00

COMMENTS:

This program was discontinued May 14, 1999.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM	Compact Fluorescent Bulb - Inactive
PARTICIPANT DEFINITION:	Number of Bulbs Installed
CUSTOMER SECTDR:	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jui	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	269

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	0	280,416
Anticipated Peak Demand (kW) Reduction:		
Summer	0	3
Winter	0	3

Costs			
	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0 00	0 00	60 00
Equipment/Vendor:	0 00	0 00	15,021 00
Promotional:	0 00	0 00	0 00
Customer Incentives:	0 00	0 00	0 00
Other Costs:	0 00	0 00	0 00
Total Program Costs	0.00	0.00	15,081.00
Lost Revenues:	0.00	25.00	1,605.00
Efficiency Incentive:	0.00	0.00	433 00
Maximizing Incentive:	0 00	0 00	0 00
Total Costs	0 00	33.00	17,119 00

COMMENTS:

This program was discontinued December 31, 1999

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	High Efficiency Heat Pumps Retro - Inactive
PARTICIPANT DEFINITION	Number of Units Installed
CUSTOMER SECTOR.	Residential
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	<u>Resistance</u>	<u>Non Resistance</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	1,387	929

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	0	71,020,985
Anticipated Peak Demand (kW) Reduction:		
Summer	0	851
Winter	0	2,995

Costs	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0 00	0 00	12,885 00
Equipmen/Vendor:	0 00	0 00	129,787 00
Promotional:	0 00	0 00	0 00
Customer Incentives:	0 00	0 00	70,500 00
Other Costs:	0 00	0 00	1,180 00
Total Program Costs	0.00	0 00	214,312.00
Lost Revenue:	0 00	(289 00)	308,980.00
Efficiency Incentive:	0 00	(2,198.00)	48,017.00
Maximizing Incentive:	0 00	0 00	8 00
Total Costs	0 00	(2,485 00)	631,294.00

COMMENTS:

This program was discontinued December 31, 2001.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	Commercial HVAC Diagnostic and Tune-up
PARTICIPANT DEFINITION.	Number of Units Installed
CUSTOMER SECTOR.	Commercial
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants		
	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	0	1
Feb	3	0
Mar	5	13
Apr	9	3
May	21	2
Jun	18	5
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	56	24
PTD	163	70

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	7,360	83,887
Anticipated Peak Demand (kW) Reduction:		
Summer	8	65
Winter	14	74

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	10,152.00	0.00	14,252.00
Equipment/Vendor:	3,900.00	0.00	11,250.00
Promotional:	0.00	0.00	4,818.00
Customer Incentives:	5,850.00	0.00	18,800.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	19,902.00	0.00	47,120.00
Lost Revenues:	662.00	0.00	2,801.00
Efficiency Incentive:	0.00	0.00	3,498.00
Maximizing Incentiva:	998.00	0.00	998.00
Total Costs	21,560.00	0.00	64,513.00

COMMENTS:

The Commercial HVAC Diagnostic and Tune-up Program provides a variety of HVAC services, including diagnostic performance checks on commercial unitary central air conditioning and heat pump units

The Equipment / Vendor cost includes the cost of incentives for participating HVAC dealers promotion of the program. The customer incentives are \$75 per program participant

The YTD Estimated in Place Energy (kWh) Savings for heat pump and air conditioner participants is 8,010 and 1,350 respectively

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for heat pump and air conditioner participants is 3/14 and 2/0 respectively

The YTD Lost Revenue for heat pump and air conditioner participants is \$569 and \$93 respectively

The Maximizing Incentive for heat pump participants is \$623 and for air conditioner participants is \$373

The participant and expense forecast for 2012 is 55 central air conditioners and 115 heat pumps and \$37,380 respectively

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Pilot Commercial Load Management
PARTICIPANT DEFINITION:	Number of Switches Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	Heat Pump	Air Conditioner
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	0	0

Impacts	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	7,532.34	0.00	11,347.34
Equipment/Vendor:	7,500.00	0.00	18,000.00
Promotional:	228.80	0.00	228.80
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	15,281.14	0.00	29,578.14
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	15,281.14	0.00	29,578.14

COMMENTS:

The Pilot Commercial Load Management Program will determine whether peak demand can be effectively reduced through the installation of load control devices on central air conditioners, heat pumps, and/or electric water heaters.

The participant and expense forecast for 2012 is 10 air conditioner switches and 10 water heater switches with a projected expense of \$36,105.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	Commercial High Efficiency HP/AC
PARTICIPANT DEFINITION.	Number of Units Installed
CUSTOMER SECTOR.	Commercial
REPORTING PERIOD.	January 1, 2012 - June 30, 2012

New Participants		
	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	0	0
Feb	1	0
Mar	1	0
Apr	0	1
May	1	0
Jun	7	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	10	1
PTD	31	4

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	1,470	16,408
Anticipated Peak Demand (kW) Reduction:		
Summer	1	6
Winter	3	11

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive</u>	
		<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	12,083.00	0.00	18,863.00
Equipment/Vendor:	550.00	0.00	1,700.00
Promotional:	0.00	0.00	9,636.00
Customer Incentives	4,150.00	0.00	12,100.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	16,783.00	0.00	40,299.00
Lost Revenues:	88.00	0.00	279.00
Efficiency Incentive:	0.00	0.00	1,224.00
Maximizing Incentive:	839.00	0.00	839.00
Total Costs	17,710.00	0.00	42,841.00

COMMENTS:

The Commercial High Efficiency Heat Pump/Air Conditioner program offers financial incentive to small commercial customers (< 100 kW demand) who upgrade to a new qualifying central air conditioner or heat pump with a Consortium for Energy Efficiency (CEE) rating. Applicable for 5 ton units or less.

The YTD Estimated In Place Energy (kWh) Savings for heat pump and air conditioner participants is 1,410 and 60 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for heat pump and air conditioner participants is 1/3 and 0/0 respectively.

The YTD Lost Revenue for heat pump and air conditioner participants is \$88 and \$000 respectively.

The Maximizing Incentive for heat pump participants is \$522 and for air conditioner participants is \$317.

The participant and expense forecast for 2012 is 20 central air conditioners and 40 heat pumps with a program budget of \$50,474.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Commercial Incentive
PARTICIPANT DEFINITION:	Number of Participants Projects Installed & Inspected
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	
Jan	0
Feb	1
Mar	3
Apr	4
May	4
Jun	12
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	24
PTD	42

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	59,810	80,693
Anticipated Peak Demand (kW) Reduction:		
Summer	97	177
Winter	97	177

Costs			
	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	33,799.00	0.00	60,988.00
Equipment/Vendor:	288,708.00	0.00	484,251.00
Promotional:	0.00	0.00	9,294.00
Customer Incentives:	28,024.00	0.00	58,312.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	330,531.00	0.00	592,845.00
Lost Revenues:	3,861.00	0.00	4,523.00
Efficiency Incentive:	0.00	0.00	42,952.00
Maximizing Incentive:	19,527.00	0.00	19,527.00
Total Costs	351,019.00	0.00	946,747.00

COMMENTS:

The Commercial Incentive program offers energy savings for all commercial business customers through promotion of high efficiency electric lighting, HVAC, pumps, and motors. Primary objectives include; increasing the market share and installation rate of high efficiency technologies, and improving the operating efficiencies of existing long life equipment for commercial customers

The participant and expense forecast for 2012 is 195 customers and \$1,530,725.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM	Smart Audit - Commercial - Inactive
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD	January 1, 2012 - June 30, 2012

New Participants	Class I	Class II
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	1,952	194

Impacts	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	n/a	n/a
Anticipated Peak Demand (kW) Reduction:		
Summer	n/a	n/a
Winter	n/a	n/a

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0 00	0 00	30,661 00
Equipment/Vendor:	0 00	0 00	1,288,178 00
Promotional:	0 00	0 00	0 00
Customer Incentives:	0 00	0 00	0 00
Other Costs	0 00	0 00	(8,158 00)
Total Program Costs	0 00	0 00	1,290,681 00
Lost Revenues:	0 00	0 00	0 00
Efficiency Incentive:	0 00	0 00	0 00
Maximizing Incentive:	0 00	0 00	84,533 00
Total Costs	0 00	0 00	1,355,214 00

COMMENTS:

This program was discontinued December 31, 2002.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM.	Smart Incentive - Commercial - Inactive
PARTICIPANT DEFINITION.	Number of Incentives
CUSTOMER SECTOR.	Commercial
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	Existing Building	New Building
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	182	69

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	0	125,682,085
Anticipated Peak Demand (kW) Reduction:		
Summer	0	1,519
Winter	0	2,640

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0 00	0 00	144,039 00
Equipment/Vendor:	0 00	0 00	21,504 00
Promotional:	0 80	0 00	0 80
Customer Incentives:	0 00	0 00	399,592 00
Other Costs:	0 00	0 80	691 00
Total Program Costs	0.00	0.00	565,828.00
Lost Revenues:	0 00	442 00	691,458 00
Efficiency Incentive:	0.00	1,078.00	68,039 00
Maximizing Incentive:	0 08	0 00	281.00
Total Costs	0 80	1,520.08	1,545,604 88

COMMENTS:

This program was discontinued December 31, 2002.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Smart Audit - Industrial - Inactive
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Industrial
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	Class I	Class II
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	60	4

Impacts	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	n/a	n/a
Anticipated Peak Demand (kW) Reduction:		
Summer	n/a	n/a
Winter	n/a	n/a

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0 00	0 00	5,741 00
Equipment/Vendor:	0 00	0 00	37,788 00
Promotional	0 00	0 00	0 00
Customer Incentives	0 00	0 00	0 00
Other Costs:	0 00	0 00	161 00
Total Program Costs	0 00	0 00	43,688 00
Lost Revenues:	0 00	0 00	0 00
Efficiency Incentive:	0 00	0 00	0 00
Maximizing Incentive:	0 00	0 00	2,188 00
Total Costs	0 00	0 00	45,874 00

COMMENTS:

This program was discontinued December 31, 1998.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Smart Incentive - Industrial - Inactive
PARTICIPANT DEFINITION:	Number of Incentives
CUSTOMER SECTOR:	Industrial
REPORTING PERIOD:	January 1, 2012 - June 30, 2012

New Participants	<u>General</u>	<u>Compressed Air</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	1	0

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated In Place Energy (kWh) Savings	0	170,525
Anticipated Peak Demand (kW) Reduction:		
Summer	0	6
Winter	0	6

Costs	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0 00	0 00	28,385 00
Equipment/Vendor:	0 00	0 00	3,288 00
Promotional:	0 00	0 00	0 00
Customer Incentives:	0 00	0 00	441 00
Other Costs:	0 00	0 00	0 00
Total Program Costs	0.00	0.00	32,114 00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	383.00
Maximizing Incentive:	0.00	0.00	655 00
Total Costs	0.00	0 00	33,182 00

COMMENTS:

This program was discontinued December 31, 1998



Kentucky Power Company Commercial Incentive Program

Process, Market and Impact Evaluation • July 2012

Submitted by

Applied Energy Group, Inc
1377 Motor Parkway, Suite 401 • Islandia, NY 11749
Tel (631) 434-1414 • Fax (631) 434-1212
www.appliedenergygroup.com

Abstract

Kentucky Power Company retained Applied Energy Group to conduct a process, market and impact evaluation of its Commercial Incentive Program. The Commercial Incentive Program provides financial incentives to business customers who implement qualified energy efficient improvements and technologies. The program provides prescriptive and custom incentives to all KPCO electric commercial customers. Prescriptive incentives include lighting, HVAC, motors and drives while custom incentives include all eligible energy savings measures not covered by a prescriptive incentive. The maximum payout is 50% of incremental equipment costs, up to \$20,000 annually per project and customer electric account.

To arrive at the final recommendations of the evaluation, AEG reviewed program materials and conducted interviews with Kentucky Power program staff, the third-party program implementation contractor and participating customers. The results of the analysis, along with key findings and recommendations for program improvements are included in this report.

Table of Contents

Abbreviations	i
Definitions	ii
Executive Summary	iv
1. Introduction.....	1
2. Program Description	1
3. Evaluation Methodology.....	3
4. Process and Market Evaluation Findings.....	6
4.1 Program Logic Model	6
4.1.1 Activities and Outputs	9
4.1.2 Outcomes	10
4.1.3 External Factors	10
4.1.4 Best Practices	11
4.2 Program Performance	11
4.3 Program Marketing	15
4.3.1 Program Awareness	15
4.3.2 Motivation for Participation.....	16
4.4 Program Tracking & Incentive Processing.....	16
4.5 Program Satisfaction	17
5. Impact Evaluation Findings	18
5.1 Gross Energy and Demand Savings	18
5.2 Net Energy and Demand Savings	19
5.2.1 Free Ridership.....	20
5.2.2 Spillover.....	21
5.3 Program Site Inspections and Performance Verification	22
5.4 Program Cost-Effectiveness	23
6. Key Findings and Recommendations	25
6.1 Summary of Key Findings	25
6.1.1 Program Performance Indicators	25
6.1.2 Program Tracking	26
6.1.3 Program Awareness and Marketing Strategies.....	26
6.1.4 Best Practices	26
6.1.5 Verify Program Impacts.....	27
6.2 Recommendations	27
6.2.1 Implementation Contractor to Increase Local Staff.....	27
6.2.2 Streamline Program Processes.....	27
6.2.3 Leverage Express Program	28
6.2.4 Express Program Incentives	29
Appendix A. Participating Customer Survey Guide	30
Appendix B. Cost-Effectiveness Analysis Inputs.....	34

List of Tables

Table ES1 2011 Actual versus Original Budget, Participation and Expenditures	v
Table ES2 2011 Energy Savings	vi
Table 1 Program Budget and Participation Goals, 2010-2012	2
Table 2 Anticipated Energy and Demand Savings, 2010-2012	3
Table 3 Overview of IMPVP Options	5
Table 4 Program Projects, Paid and Cancelled in 2011	13
Table 5 2011 Cost per Participant, Budgeted and Actual	14
Table 6 Number of Trade Ally Presentations/Meetings by Month	15
Table 7 Total Gross Demand and Energy Savings, by Project	19
Table 8 2011 Net Demand and Energy Savings, by Project	20
Table 9 Free Ridership Probability Scores, Questions 1 and 3	21
Table 10 Free Ridership Weighted Probability	21
Table 11 Spillover Probability	22
Table 12 Spillover Weighted Probability	22
Table 13 Installation Verification Site Visits, 2011	23
Table 14 Program Cost-Effectiveness Results	24
Table 15 Cost-Effectiveness Results if Planned Participation Achieved, 2011	24
Table 16 Cost-Effectiveness Results if Program Administration Costs Reduced, 2011	25
Table 17 Kentucky Power Portfolio Cost-Effectiveness Results, 2011	25
Table 18 2011 Actual versus Original Budget, Participation and Expenditures	25
Table 19 2011 Energy Savings	27

List of Figures

Figure 1 Program Logic Model	8
Figure 2 Project Status by Month, 2011	12
Figure 3 Program Processes, Length of Time (n=5)	14
Figure 4 How Customers First Learned of the Program (n=5)	16
Figure 5 Customer Motivation for Participation (n=5)	16
Figure 6 Participant Satisfaction with the Program (n=5)	17
Figure 7 Reasons Participant Would Recommend the Program (n=5)	18

Abbreviations

AEG	Applied Energy Group, Inc.
AEP	American Electric Power
EM&V	Evaluation Measurement and Verification
DSM	Demand Side Management
HVAC	Heating Ventilation & Air Conditioning
IPMVP	International Performance Measurement and Verification Protocols
KPCO	Kentucky Power Company
NTG	Net-To-Gross Ratio
PSC	Public Service Commission
QA/QC	Quality Assurance/Quality Control

Definitions

Benefit-Cost Ratio: The ratio of total benefits of a program to the total costs discounted over some specified time period. The benefit-cost ratio gives a rough measure of the participant rate of return and provides an indicator of program risk. A ratio above one indicates a beneficial program.

Participant Cost Test: Measures the quantifiable benefits and costs to the customer due to participation in a program.

Program Administrator Cost Test: Measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs), excluding any net costs incurred by the participant. The benefits are similar to the Total Resource Cost benefits, but costs are more narrowly defined.

Ratepayer Impact Measure (RIM) Cost Test: Measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected are less than the total costs incurred by the utility. The RIM test indicates the direction and magnitude of the expected change in customer bills or rate levels.

Total Resource Cost (TRC) Test: Measures the net costs of a demand side management program as a resource option based on the total costs of the program, including both the participant and utility costs.

Coincidence Factor: The ratio, expressed as a numerical value or as a percentage, of the simultaneous maximum demand of a group of electrical appliances or consumers within a specified period to the sum of their individual maximum demands within the same period.

Cost-effectiveness: A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the lowest cost alternative for the achievement of a given target.

Demand Side Management (DSM): Programs designed to provide incentives to end-use customers or curtailment service providers to enhance the ability and opportunity for reduction of load during peak hours.

Evaluation Measurement and Verification: A set of analyses used to assess energy efficiency programs in terms of energy and demand savings and cost-effectiveness. There are several approaches to EM&V, some of which have been codified as best practices (see IPMVP). Most energy efficiency programs are subject to some type of EM&V.

GRID SMART® Programs: An AEP energy efficiency initiative that includes over 100 energy efficiency programs across the AEP service territory. The programs feature smart grid technologies such as smart meters, voltage optimization equipment and smart appliances that can reduce energy use.

Gross Energy Savings: Energy and demand savings seen by the participant at the meter. These are the appropriate program impacts to calculate bill reductions for the Participant Test.

Impact Evaluation: A method of evaluation that assesses any changes, intended or unintended that are directly attributable to an energy efficiency program.

International Performance Measurement and Verification Protocols (IPMVP): Provides an overview of current best practice techniques available for verifying results of energy efficiency, water efficiency,

and renewable energy projects in commercial and industrial facilities. It may also be used by facility operators to assess and improve facility performance. Energy conservation measures covered in the protocols include fuel saving measures, water efficiency measures, load shifting and energy reductions through installation or retrofit of equipment, and/or modification of operating procedures.

Kilowatt (kW): A unit of power that describes the rate at which energy is generated or used. It quantifies the electric power required by an appliance or device such as a light bulb.

Kilowatt Hour (kWh): A unit of energy that describes how much electricity is consumed over a period of time. For example, if you turn on a 100 watt light bulb all day for 24 hours the light bulb consumed 2.4 kWh of electricity.

Net Energy Savings: The energy and demand savings attributable to the program, adjusted for free riders and spillover.

Net-to-Gross (NTG) Ratio: The ratio of net energy savings to gross energy savings indicates the overall effectiveness of an energy efficiency program. As the NTG ratio approaches one, the magnitude of the program impact increases.

Free Riders: Customers who participate in energy efficiency programs who would have engaged in the efficient behavior in the absence of the program. As a result, the presence of free riders tends to overestimate the energy savings of the program.

Spillover: Customers who engage in energy efficient behavior, but do not participate in the program, due to some influence of the program.

Process Evaluation: A method of evaluation that uses empirical data to assess the delivery of energy efficiency programs, verify goals and determine whether the program is implemented as designed.

Program Logic Model: Graphic representation of an energy efficiency program and its processes. Logic models show the causal relationships or linkages among the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders critical to a program's performance.

Executive Summary

Applied Energy Group, Inc ("AEG") was retained by Kentucky Power Company ("KPCO" or "Kentucky Power") to conduct a process, market and impact evaluation of its Commercial Incentive Program. The Commercial Incentive Program provides prescriptive and custom financial incentives to all electric business customers who purchase and install qualified energy efficient improvements and technologies. In 2012, new construction and a direct install program will be added to the program. Prescriptive incentives include lighting, HVAC, motors and drives while custom incentives include all eligible energy savings measures not covered by a prescriptive incentive. The maximum payout is 50% of incremental equipment costs, up to \$20,000 annually per project and customer electric account.

AEG designed the process and market evaluation to examine program processes and customer responses to the program. The evaluation identifies methods for gathering data and measuring program results, and makes recommendations for program improvements. To arrive at the final recommendations, AEG performed the following tasks:

- Reviewed program materials, data and tracking methods.
- Updated program logic model and assessed program flow.
- Conducted interviews with KPCO staff and program implementation contractor.
- Conducted surveys of participating customers.

AEG designed the impact evaluation to assess the gross and net demand savings, gross and net energy savings, and the cost-effectiveness of installed measures. The evaluation verifies gross and net savings and measure installation. To verify program impacts AEG performed the following tasks:

- Calculated the gross energy (kWh) and peak (kW) impacts by project using engineering calculations.
- Performed cost-effectiveness analysis using a benefit-cost analysis model.
- Conducted site inspections of a sample of installed projects.

Summary of Key Findings

The primary objectives of the Commercial Incentive Program are to increase the market share of commercial grade high efficiency technologies sold through market channels, increase the installation rate of high efficiency technologies in commercial facilities, and improve operating efficiency of existing long life equipment to insure peak operating efficiency.

Program Performance Indicators

In 2011, eighteen (18) lighting projects were completed through the Commercial Incentive Program at a higher cost per participant than originally budgeted due to high fixed costs independent of program participation. Sixteen (16) projects were cancelled, primarily resulting from participants purchasing and/or installing equipment prior to beginning the participation process. Kentucky Power achieved approximately 20 percent of the 88 participant goal.

Table ES1 2011 Actual versus Budgeted Participation and Expenditures

	Actual	Original Budget	Revised Budget
Participation	18	88	88
Expenditures	\$252,314	\$896,152	\$910,560

The Commercial Incentive Program was approved in October 2010. KEMA implemented the program from its headquarters in Michigan until a local representative was hired in September 2011. Program participation was slow until October 2011, not long after the local representative was retained.

Program Tracking

The program tracking and monitoring system accurately tracks program data. However, based on the project applications provided by KEMA:

- 50 percent of pre-approval inspections were conducted before the pre-approval application was submitted, on average 35 days prior to the application submittal. 6 percent of inspections were conducted on the same date.
- 22 percent of post-installation inspections were conducted before the final application was submitted, on average 5 days prior to the application submittal. 28 percent of inspections were conducted on the same date.

Program Awareness and Marketing Strategies

The marketing strategy for the program included promoting the program directly to both eligible customers as well as business organizations, contractors and local government officials that were expected to promote the program to eligible customers.

KPCO Customer Services Group provided program information to eligible customers. According to KEMA, the Customer Services Group referred between 10 and 20 percent of program participants. The Trade Ally kick-off meetings held by KEMA were poorly attended. However, the KEMA representative met with numerous business and civic organizations as well as eligible customers in late 2011.

According to survey respondents, customers most often learned of the program from a business associate or the Kentucky Power website. Approximately 60 percent of participating customers met with the KEMA local representative prior to submitting the pre-approval application.

Best Practices

Kentucky Power's program design and processes are largely consistent with best practices for similar energy efficiency programs. Depending on the design of the commercial energy efficiency program, incentives may be direct (i.e. rebates and discounts) or indirect (i.e. manufacturer and/or retailer buy-downs). Direct incentives are typically a range per measure or a percentage of project costs. For example, incentives for fluorescent fixtures typically range between \$1 and \$200 per unit or between 30 and 50 percent of project cost. Custom incentives range between \$0.03 and \$0.75 per kWh saved,

depending on the type and cost of the project. Incentives for large scale projects are typically capped at a percentage of the incremental cost.¹

The challenges posed by lack of information are ubiquitous to energy efficiency programs. Investment in education and outreach will boost awareness of the potential benefits of energy efficiency. Successful marketing strategies can increase program participation.

Verify Program Impacts

The net-to-gross ratio for the Commercial Incentive Program is estimated 77 percent, with 29 percent free ridership and 6 percent spillover. Program cost-effectiveness was greatly affected by the low participation rates and high program administration, marketing and evaluation costs.

If the planned participation levels of 88 completed projects were achieved and projects save an average of 25,000 kWh and 5.5 kW, the program would be cost-effective and pass the TRC test, assuming actual 2011 expenditures. Alternatively, if program administrative costs were set equal to the ratio of original approved incentive to administrative costs and projects save an average of 25,000 kWh and 5.5 kW, the program would be cost effective and pass the TRC test, assuming actual 2011 participation. Going forward, it is vital that either participation goals be met or program administrative costs be reduced for the Commercial Incentive Program to reach acceptable cost-effectiveness levels.

Table ES2 2011 Energy Savings

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Program Total	77%	74.86	74.86	316,362	0.63

Site inspections and installation verifications were performed on eight fully installed projects to ensure proper installation. Proper installation verification was confirmed at all locations.

Recommendations

AEG has several recommendations on how to improve the program. These include:

Implementation Contractor to Increase Local Staff

AEG recommends that KEMA increase the local staff by at least one employee. Four (4) KEMA staff members worked remotely from Michigan until the local representative was hired in September 2011. While participation increased significantly between October and December, the program was promoted primarily through direct customer contact and Trade Ally outreach. AEG recommends that KEMA continue to utilize direct customer contact and Trade Ally outreach as the primary promotional activities. However, these promotional activities require considerable amounts of time to be successful. Because of the large geographic area of the Kentucky Power service territory, KEMA needs on-site staff in both the northern and southern portion of Kentucky Power's territory. An additional local

¹ National Action Plan for Energy Efficiency (2010). *Customer Incentives for Energy Efficiency Through Program Offerings*. Prepared by William Prindle, ICF International, Inc. <www.epa.gov/eeactionplan>

representative assisting with promotional efforts should increase participation and improve overall efficiency, particularly as the new program components are offered to customers.

Streamline Participation Process

AEG recommends that KEMA improve and streamline the participation process. The Commercial Incentive Program participation process was designed to include the following steps:

- 1) Customer/contractor submits the pre-approval application.
- 2) KEMA reviews the application and conducts a pre-approval inspection. If approved, the customer receives a letter confirming the funding reservation and detailing the terms and conditions of the program.
- 3) The approved equipment is installed and the customer/contractor submits the final application.
- 4) KEMA reviews the application and conducts a post-installation inspection. If approved, the customer incentive is processed.

The program does not operate as designed. In 2011, 50 percent of pre-approval inspections were conducted before the pre-approval application was submitted and 22 percent of post-installation inspections were conducted before the final application was submitted. KEMA is contracted to provide customer technical support to facilitate the pre-approval application, as needed. Therefore, the KEMA local representative is likely conducting the pre-approval inspection while providing technical support.

AEG recommends that the pre-approval inspection be conducted no sooner than the day the pre-approval application is submitted to KEMA. The KEMA representative may provide technical assistance to the customer/contractor for the application and conduct the inspection on the same day, but the application must be submitted to KEMA that day. The post-installation inspection should be conducted after the final application has been received and reviewed by KEMA.

AEG recommends that the program be modified such that KEMA conducts random inspections of at least 15 to 20 percent of pre- and post-installation projects, to be adjusted depending upon the inspection findings. The inspections are to be random; the pre- and post-installation inspections are not necessarily to be conducted on the same project. Depending upon the inspection findings, Kentucky Power and KEMA should reassess the need for pre-installation inspections.

AEG recommends that Kentucky Power and KEMA examine the customer incentive reservation period. Currently, customer incentives are reserved for 180 days, during which time the project must be completed. Rather than one consistent reservation period, the length of the incentive reservation may be based on the type and difficulty of the project. For example, a simple lighting retrofit may have a reservation of 90 days while a project that undertakes lighting and HVAC may have 120 days.

Leverage Express Program

In 2012, the Commercial Incentive Program will consist of three programs: Prescriptive and Custom Incentives (current program), Express Program, and the New Construction Program. The Express Program will provide incentives to non-residential customers with an average demand of less than 100 kW that have a participating contractor install efficient measures. The New Construction Program will

provide incentives to non-residential customers that are above the current building energy code for new additions, major renovations or new facilities.

AEG recommends that KEMA leverage the new Kentucky Power Express Program and New Construction Program to increase program awareness. KEMA should encourage sub-contractors involved in the Express Program to promote prescriptive and custom incentives to eligible customers. Additionally, KEMA should promote the prescriptive and custom incentives to customers that participate in the New Construction Program.

Express Program Incentives

AEG reviewed the Express Program, anticipated for mid-2012. The program will provide incentives to non-residential customers with an average demand of less than 100 kW that have a participating contractor install efficient measures. KPCO service territory comprises approximately 26,970 commercial and public authority accounts with a peak demand of 50 kW or less.²

AEG recommends that KPCO consider increasing incentives to 60 to 70 percent of the installed equipment costs. Incentives are currently capped at 50 percent of the incremental material costs, the same as the current Commercial Incentive Program prescriptive and custom incentives. However, direct install programs typically offer small non-residential customers higher incentives and, occasionally, financing for the remaining portion of the installation cost.

² Case No. 2010-00198.

1. Introduction

Applied Energy Group, Inc. ("AEG") was retained by Kentucky Power Company ("Kentucky Power" or "KPCO") to conduct a comprehensive evaluation of its 2010-2012 Demand Side Management ("DSM") Program Portfolio.³ The 2010-2012 DSM Program Portfolio includes the Residential Efficient Products Program, Residential and Small Commercial HVAC Diagnostic and Tune-up Program, Commercial Incentive Program, Small Commercial High Efficiency Heat Pump and Air Conditioner Program, and the Residential and Small Commercial Load Management Pilot Program. The DSM programs will be evaluated concurrently and individual program Evaluation, Measurement and Verification ("EM&V") reports will be filed with the Kentucky Public Service Commission ("PSC") by the August 15, 2012 regulatory filing deadline.

Kentucky Power is an electric utility that serves approximately 175,000 customers in all or part of 20 eastern Kentucky counties.⁴ The utility is part of the American Electric Power ("AEP") system, which is one of the largest electric utilities in the United States.⁵ The 2010-2012 DSM Program Portfolio was implemented to help Kentucky Power and AEP reduce electricity use and peak demand, help customers lower their electricity bills, and encourage long-term change in the market through the adoption of energy efficiency technologies and services.

The Commercial Incentive Program provides prescriptive and custom financial incentives to all electric business customers who purchase and install qualified energy efficient improvements and technologies. Prescriptive incentives include lighting, HVAC, motors and drives while custom incentives include all eligible energy savings measures not covered by a prescriptive incentive. The maximum payout is 50% of incremental equipment costs, up to \$20,000 annually per project and customer account.

This report describes the key findings from the process, market and impact evaluation and provides recommendations for improving program performance and operations. Section 2 provides a program description and Section 3 described the process and impact evaluation methodology. Sections 4 and 5 present the process, market and impact evaluation findings. Key findings and recommendations are described in Section 6.

2. Program Description

The Commercial Incentive Program provides financial incentives to business customers who purchase and install energy efficient technologies in existing and new construction facilities. The program is available to all commercial customers within the KPCO's retail electric service territory. Prescriptive and custom incentives are available for a variety of efficient technologies.

³ Kentucky Power's 2010-2012 DSM programs were approved in Case No. 2010-00095 and Case No. 2010-00198.

⁴ Kentucky Power. Facts, Figures & Bios. Accessed at www.kentuckypower.com/info/facts/

⁵ American Electric Power delivers electricity to more than 5 million customers in 11 states and ranks among the nation's largest generators of electricity, with almost 38,000 megawatts of generating capacity in the U.S.

Prescriptive Incentives are intended to encourage business customers to purchase and install a standard set of high efficiency measures. Incentives are available for:

- Lighting
- Heating, Ventilation and Air Conditioning (HVAC)
- Refrigeration
- Miscellaneous Equipment

Custom Incentives are intended to encourage business customers to purchase and install high efficiency measures not covered by a prescriptive incentive. Incentives are based on measure-specific energy savings and paid at 8 cents per unit of electricity (kWh) saved.

Maximum incentives per project are 50% of incremental equipment costs, up to \$20,000 annually per project and per customer account. The primary objectives of the Commercial Incentive Program are:

- Increase the market share of commercial grade high efficiency technologies sold through market channels.
- Increase the installation rate of high efficiency technologies in commercial facilities.
- Improve operating efficiency of existing long life equipment to insure peak operating efficiency.

In 2012, KPCO will add new construction and direct install ("Express Program") components to the program. The New Construction Program will provide incentives to non-residential customers that are above the current building energy code for new additions, major renovations or new facilities. The Express Program will provide incentives to non-residential customers with an average demand of less than 100 kW that have a participating contractor install efficient measures. Express Program incentives are capped at 50% of the incremental material costs, not to exceed \$20,000 per facility per year.

The Kentucky Public Service Commission ("PSC") approved a three-year budget and participation goals for the Commercial Incentive Program.⁶ Table 1 presents the originally filed program budget and participations goals for 2010 through 2012. The program budgets were revised from the original filing to \$910,560 in 2011 and \$1,630,725 in 2012. Table 2 shows the anticipated energy and demand savings for 2010 through 2012.

Table 1 Program Budget and Participation Goals, 2010-2012

	2010	2011	2012
Contractor Administration	\$98,450	\$236,268	\$461,796
Customer Incentive	\$44,748	\$562,544	\$1,099,517
Promotion	\$25,000	\$60,000	\$98,960
Evaluation	\$8,000	\$37,340	\$68,210
Total	\$176,198	\$896,152	\$1,728,483
Participation	7	88	172

⁶ See Case No. 2010-00198.

Table 2 Anticipated Energy and Demand Savings, 2010-2012

	Summer kW	Winter kW	kWh
2010	47	82	392
2011	596	1,034	4,929
2012	1,165	2,021	9,635

3. Evaluation Methodology

AEG designed the process, market and impact evaluation to determine the efficacy of program procedures and systems, evaluate the achievement of program objectives, provide insight into and recommendations for program improvement and verify the direct impacts of program activities.

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and quality assurance/quality control ("QA/QC") procedures are performing as designed and identifies issues or opportunities to improve these key elements. The goals of the process and market evaluation are to:

- Examine key performance indicators to identify participation or program issues;
- Conduct a comprehensive review of program tracking or monitoring systems to review the accuracy of and trends in data;
- Determine awareness levels as a way to refine marketing strategies and reduce barriers to program participation; and
- Assist program implementers and managers to structure programs and achieve cost-effective savings while maintaining high levels of customer satisfaction;
- Provide recommendations for changing the program's structure, management, administration, design, delivery, operations and/or goals.

Impact evaluations assess the cost-effectiveness of a DSM program and verify the energy and demand savings directly associated with it. The goals of the impact evaluation are to:

- Verify the annual energy and coincident peak capacity savings and total resource benefit claims made by Kentucky Power; and
- Provide verification and documentation of DSM program impacts.

To arrive at the final recommendations, AEG carried out the following research activities.

Review Program Materials

AEG reviewed current program materials, documents and processes, including the rebate applications and marketing and outreach materials. The review served as the basis for understanding whether the program has been implemented as planned. The review was particularly important for preparing the interview guides and survey instruments for other process evaluation tasks.

Program Logic Model

AEG developed a program logic model based on a review of program materials and discussions with Kentucky Power program staff. The model shows the linkages between the program components, including activities, outputs, outcomes and key stakeholders. The model also highlights potential external influences and program inputs.

Program Tracking and Database Review

AEG reviewed current Kentucky Power rebate application review and processing, program tracking and reporting, and tracking databases.

Kentucky Power Staff Interview

AEG conducted a comprehensive, group interview with Kentucky Power program staff in November 2011. The purpose of this interview was to get staff impressions of program implementation activities, program performance, marketing and customer awareness of the program, program data and tracking mechanisms, and opportunities for improving the program. Between December 2011 and March 2012 AEG conducted individual interviews with program staff, as well as informal discussions regarding program performance. The individual interviews focused on program design and delivery issues, program performance, potential areas of improvements, and overall program effectiveness.

Third-Party Implementer Interview

The Commercial Incentive Program was implemented by KEMA. As program implementer, KEMA worked with Kentucky power to perform the following duties:

- Develop, track and administer services to achieve completion of program goals and budget.
- Program design: define program eligibility, product selection and incentives and establish data collection requirements and tracking and reporting systems.
- Program implementation: market and promote the program, engage businesses and facilities to participate, process applications and issue customer checks, and provide technical service.
- Provide training to Kentucky Power personnel and trade allies on the program application, procedures, etc.
- Customer Service: provide call center support and maintain a secure customer database.
- Perform QA/QC.

AEG interviewed KEMA in November 2011 and January 2012. The interview provided information on program implementation activities, program data and tracking methods, the relationship between the program implementation contractor and customers, and barriers to increased participation. AEG also obtained detailed information on program performance.

Participating Customer Surveys & Site Visits

AEG administered an internet survey to a sample of program participants to assess program experience and awareness, customer satisfaction, barriers to participation, free ridership and areas for potential program improvement. Eighteen (18) projects, completed by 10 businesses, received an incentive for completing a project in 2011. KEMA provided email contact information for 9 of the businesses. The population size was too small to achieve a sample size at a 90 percent confidence interval with an error

margin of +/-10 percent. Therefore, AEG issued the survey to all 9 businesses (see Appendix A for the survey guide). Five (5) surveys were completed.

AEG conducted site visits of 8 participating customers to assess services rendered and verify that the rebated equipment was installed, as compared to KEMA's records.

Review Engineering or Deemed Savings Assumptions

AEG reviewed the engineering and/or deemed savings assumptions utilized by KEMA to calculate program energy and demand impacts. Kentucky Power's initial program filing deemed savings assumptions were reviewed to ensure consistence with the Impact evaluation results.

Gross Energy and Demand Impacts

AEG determined the gross energy and demand savings of a representative sample based the international Performance Measurement and Verification Protocols ("IPMVP")⁷ Option A.

Table 3 Overview of IMPVP Options

IPMVP M&V Option	Measure Performance Characteristics	Data Requirements
Option A: Engineering calculations using spot or short-term measurements, and/or historical data	Constant performance	<ul style="list-style-type: none"> • Verified installation • Nameplate or stipulated performance parameters • Spot measurements • Run-time hour measurements
Option B: Engineering calculations using metered data.	Constant or variable performance	<ul style="list-style-type: none"> • Verified installation • Nameplate or stipulated performance parameters • End-use metered data
Option C: Analysis of utility meter (or sub-meter) data using techniques from simple comparison to multivariate regressor analysis.	Variable performance	<ul style="list-style-type: none"> • Verified installation • Utility metered or end-use metered data • Engineering estimate of savings input to SAE model
Option D: Calibrated energy simulator/modeling; calibrated with hourly or monthly utility billing data and/or end-use metering	Variable performance	<ul style="list-style-type: none"> • Verified installation • Spot measurements, run-time hour monitoring, and/or end-use metering to prepare inputs to models • Utility billing records, end-use metering, or other indices to calibrate models

Engineering calculations referenced from the *New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts by project.

Net Energy and Demand Impacts

AEG adjusted the gross energy and demand savings to reflect estimates of free ridership and spillover. Free ridership and spillover were determined from the retailer interviews; see Section 5 for a detailed explanation.

⁷ IPMVP provides best practice techniques for verifying results of energy efficiency projects, i.e. verifying savings attributed to energy efficiency projects.

Cost-Effectiveness Analysis

AEG analyzed the cost-effectiveness of the Commercial Incentive Program utilizing Bencost, an updated version of a public domain model that AEG customized for Kentucky Power. Bencost is an input-output model that calculates four standard California cost-effectiveness tests, the Total Resource Cost, Participant Test, Utility Test and Rate Impact Measure Test. The analysis was conducted using Kentucky Power specific inputs, including avoided costs, discount rates, participation and incentives. Appendix B provides more detail regarding the cost-effectiveness inputs and outputs.

4. Process and Market Evaluation Findings

The process and market evaluation identified whether key elements, such as incentive levels, program delivery, program tracking mechanisms and QA/QC procedures were performing as designed. When potential deficiencies in these areas arise, the process and market evaluation identified opportunities for improving these key elements.

4.1 Program Logic Model

Program logic models are graphic representations of an energy efficiency program and its processes. Logic models show the causal relationships or linkages between the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders that are critical to a program's performance.⁸

Key elements of a program logic model include:

- **Inputs.** Resources that program stakeholders contribute to a program, such as knowledge, skills, expertise, finances or equipment.
- **Outputs.** Program activities and number of people reached, based on program goals.
- **Outcomes.** Short-term, intermediate or long-term results of the program outputs. Assists evaluators and program administrators in establishing program results.
- **External Influences.** Factors outside the utility's control that may influence the program outcomes. They help to identify important program partnerships as well as the issue(s) the program can realistically influence. The factors help determine which evaluation measures will accurately reflect project outcomes or any other goals that must be met to address the problem or situation.

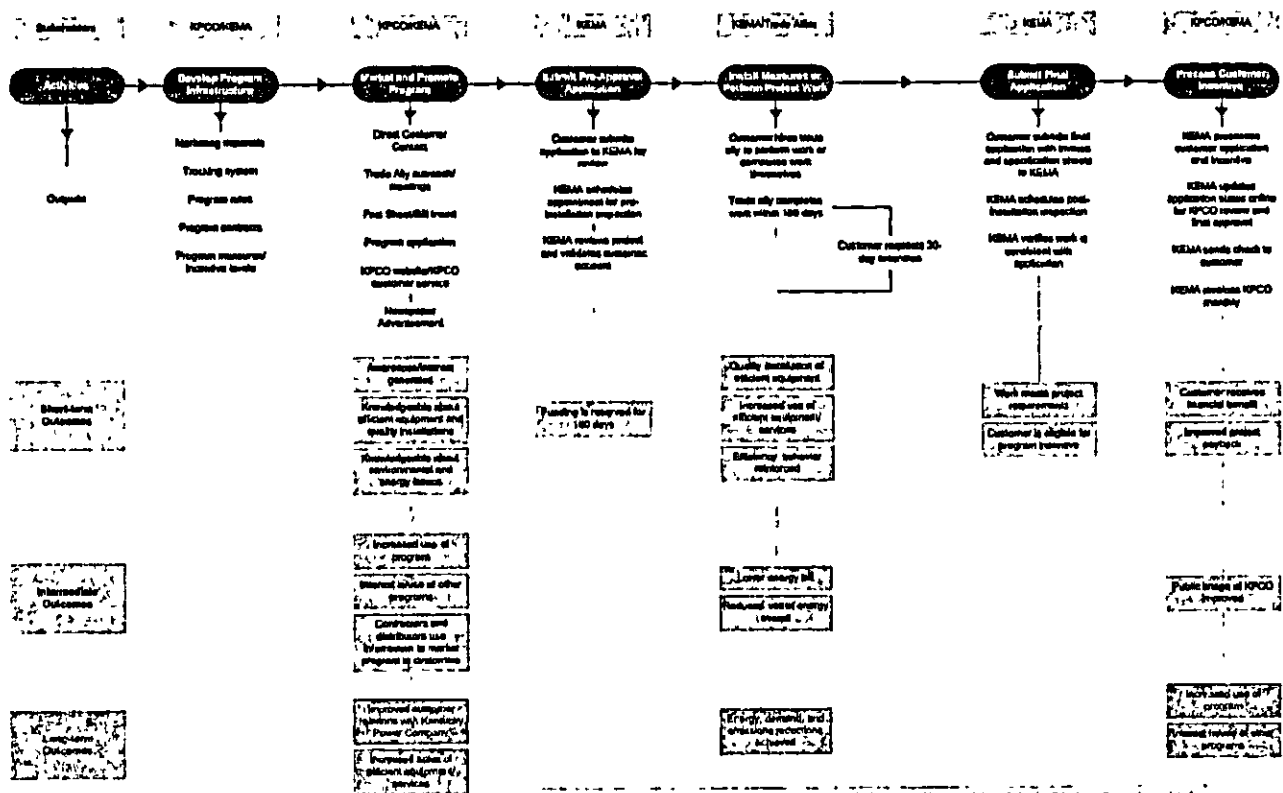
In the logic model presented in Figure 1, program activities are oriented sequentially across the top of the page from the left to the right. The sequence of program activities is important. For example, the program's infrastructure, including its advertising materials, tracking systems, program rules, and contracts must be developed before the program can be marketed and customers recruited. The

⁸ McCawley, P. (2001). *The Logic Model for Program Planning and Evaluation*. Moscow: University of Idaho Extension.

performance outputs and outcomes are oriented vertically from top to bottom. The box on the bottom right contains the external factors outside the utility's control that may affect program performance.

Figure 1 Program Logic Model

Inputs: program funding, KPSC goals and reporting requirements, AEP human resources and integrated resource plan goals, Kentucky Power program staff, implementation contractor resources and expertise, evaluation contractor resources and expertise, existing programs of Kentucky Power



External influences: Changes in political priorities (e.g. solar and wind), state and local regulations, federal policies, weather and associated impacts on energy bills, energy prices and regulations; changes in utility rate structure, investments in the state of energy efficiency, competing interests among various utility customers, and performance and availability of efficiency technologies and services.

4.1.1 Activities and Outputs

There were six main activities in the Commercial Incentive Program. The program activities and their corresponding outputs help to establish linkages between the situation that the program was designed to address and the program's intended outcomes. Therefore, activities and outputs are discussed together.

Develop Program Infrastructure

Activities included gathering market knowledge, setting program goals, designing the program, establishing program rules, developing marketing approaches and content, and establishing institutional and operating structures. KEMA, in consultation with Kentucky Power staff, designed the program, including eligible measures and incentive levels, rebate applications and application processes, data tracking system and marketing materials.

Promote and Market Program

The marketing strategy included direct customer contact, trade ally meetings and cold calls, chamber of commerce meetings as well as fact sheets, newspaper advertisements and bill inserts. KEMA's local representative recruited trade allies to promote the program and engaged and educated eligible customers. The KPCO Customer Services Group provided program information to eligible customers.

Submit Pre-Approval Application

The customer may have obtained a pre-approval application from the KPCO Commercial Incentive Program's website or KEMA's local representative. The customer completed the pre-approval application and submitted it to KEMA via mail, email or fax prior to purchasing equipment or committing to a project. KEMA reviewed the application, verified customer eligibility and scheduled a pre-installation inspection. Once the pre-installation had been completed and the existing equipment verified, the application was approved and the customer incentive was reserved.

The local representative marketed and promoted the program through cold calls and directly engaging potential participants. During an in-person meeting with a potential participant, the representative would provide the application and explain the participation process. The representative may have completed the pre-approval application with the customer and/or conducted the pre-installation inspection during the meeting. The pre-approval process had an advertised time of four to six weeks.

The customer received a letter confirming the equipment, the total incentive and the incentive reservation as well as detailing the terms and conditions of the program. Customer incentives were reserved for 180 days, during which time the project had to be completed.

Install Measures/Perform Project Work

The customer performed the approved project within the 180 day reservation period. If the customer did not complete the project within 180 days, they were reminded of the project reservation. Three 30-day extensions were granted to the customer.

The customer was responsible for securing materials, hiring a contractor (if needed) and paying up-front costs.

Submit Final Application

Within 60 days of project completion, the customer completed the final application and submitted it to KEMA via mail, email or fax. The final application was the same form as the pre-application, but required a customer signature. KEMA reviewed the application and conducted a post-installation inspection to verify the equipment installed was consistent with the application.

Process Customer Incentive

Kentucky Power program staff reviewed the final application information provided by KEMA and approved the incentives. KEMA processed customer incentives and issued incentive checks.

Kentucky Power maintained the right to conduct random post-installation inspections to verify the services are being performed properly and to determine customer satisfaction. To-date no inspections have been conducted.

4.1.2 Outcomes

Outcomes are the result of program partners and target audiences responding to the program outputs.

Short-term Outcomes

When the program is marketed and promoted, customer awareness and interest in more efficient equipment may increase. Other short-term outcomes include increased quality installation, increased awareness of environmental and energy issues, reinforcement of efficiency behavior and financial benefits from program participation.

Intermediate Outcomes

Intermediate outcomes may include increased use of the program, interest in, and use of, other KPCO efficiency programs and reduced energy consumption.

Long-term Outcomes

The long-term outcomes may include an expanded market for efficient equipment and sales, reduced utility emissions, fewer greenhouse gases emitted. Kentucky Power may enhance its public image as a utility that responds to customer needs without sacrificing consideration of environmental issues.

4.1.3 External Factors

Documenting external factors outside the control of Kentucky Power and its stakeholders improves program planning and evaluation by identifying important program partners, the activities the program can realistically influence, which evaluation measures will accurately reflect project outcomes, and other needs that must be met.

- Changes in political priorities (e.g. codes and standards, state and local regulations, federal policies, perceptions of energy and climate change);
- Weather and associated impacts on customer actions and energy bills;
- Energy prices and regulation;
- Changes in utility rate structures;
- Perceptions in the value of energy efficiency;

- Competing interests among demand side customers; and
- Cost, performance and availability of efficient technologies and services.

4.1.4 Best Practices

Program administrators encounter common challenges that hinder energy efficiency programs from achieving maximum benefits, including, but not limited to:

- Lack of information and awareness of energy efficiency benefits.
- Limited resources / High initial costs energy efficient technologies.
- Competing priorities among customers and program administrators.
- Lack of clear, well-communicated program goals that correspond to overall organizational goals.

Best practices can provide ideas and/or tools to overcome these and other program barriers. Some key best practices include, but are not limited to, the following:

- Coordinate with other energy efficiency program administrators to overcome market barriers.
- Increase awareness by investing in education, outreach and marketing activities.
- Solicit stakeholder input and feedback to optimize program design and delivery.
- Develop reliable program tracking systems to support evaluation and implementation.

4.2 Program Performance

In 2011, eighteen (18) lighting projects were completed and approximately \$25,000 in incentives was issued through the Commercial Incentive Program. Kentucky Power achieved approximately 20 percent of the 88 participant goal for 2011.

The Commercial Incentive Program was approved in October 2010, two months later than anticipated. Kentucky Power staff immediately sought an implementation contractor, awarded KEMA the contract in December 2010 and finalized a contract with KEMA in February 2011. The kick-off meeting was held March 15, 2011, approximately one month after the agreement between Kentucky Power and KEMA was finalized. KEMA implemented the program from its headquarters in Michigan until a local representative was hired in September 2011. As seen in Figure 2, program participation was slow until October 2011, not long after the local representative was retained.

Figure 2 Project Status by Month, 2011

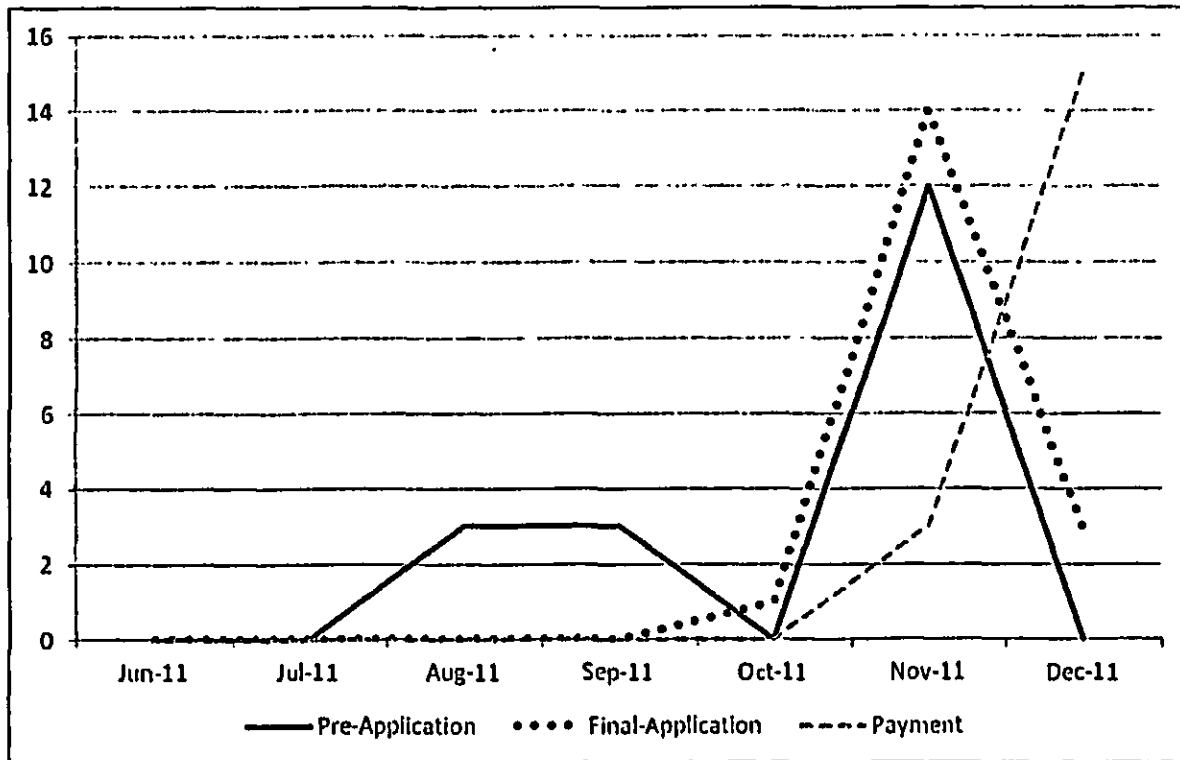


Table 4 presents the paid and cancelled projects in 2011 as well as the associated incentives and energy savings by project. Sixteen (16) projects were cancelled. According to KEMA, most cancellations resulted from participants purchasing and/or installing equipment prior to beginning the participation process. Projects in-process or recently completed were ineligible for the Commercial Incentive Program.

Table 4 Program Projects, Paid and Cancelled In 2011

Status	Organization	Building Type	Project Type	Projects	Incentive	kWh Savings
Paid	Ammar's Inc (Magic Mart)	Retail/Service	Custom	3	\$2,200	27,496
	Ashland Hospital Corporation	Medical	Lighting	1	\$7,317	116,896
	Breathitt County Board of Education	K-12 School	Lighting	1	\$2,310	37,125
	Cintas	2 Shift Manufacturing	Lighting	1	\$3,631	89,884
	Eastern Kentucky Exposition Center	Miscellaneous	Lighting	1	\$1,620	23,283
	Edward Jones Branch 1699	Retail/Service	Lighting	1	\$286	3,045
	Edward Jones Branch 32540	Retail/Service	Lighting	1	\$286	3,045
	Floyd County Schools	K-12 School	Custom	3	\$2,112	26,397
	Greenup County 8d of Ed	K-12 School	Lighting	1	\$874	10,733
	Jackson Independent School District	K-12 School	Lighting	1	\$875	14,063
	Maurices Incorporated	Retail/Service	Lighting	4	\$3,615	60,467
	Aldi Inc.	Grocery	Refrigeration	1	\$690	8,901
	FOOD FAIR INC	Grocery	Lighting	1	\$1,118	0
	Grand Strand Beauty Salon	Retail/Service	Custom	1	\$242	3,023
	Cancelled	Hall Properties LLC	Office	HVAC	1	\$50
		Lighting		1	\$338	3,694
Hazard Lion's Club Montessori School		K-12 School	HVAC	1	\$260	2,283
Letcher County Public Schools		K-12 School	Lighting	5	\$360	3,372
River Cities Harvest Inc			NONE	1	\$0	0
Russell Independent School		K-12 School	Lighting	2	\$275	3,570
Safe Harbor		Refrigeration	1	\$0	0	
Three Rivers Medical	Medical	HVAC	1	\$450	43,956	

Of the projects paid in 2011:

- 1 was completed in November and 17 in December.
- 12 were prescriptive and 6 were custom.
- 6 were installed by contractors, 11 were self-installed and 1 was unknown.
- 10 were corporate and 8 were tax-exempt facilities.
- 50 percent were retail/service facilities and 33 percent were schools.
- The incentive covered, on average, 42 percent of the installed measure cost.

Table 5 presents the budget and budgeted cost per participant as compared to the actual expenditures and actual cost per participant. The actual 2011 expenditures were \$252,314 compared to the original approved budget of \$895,152. The actual cost per participant was higher than budgeted due to high fixed administrative costs, independent of program participation. Program administrative costs accounted for 88 percent of actual 2011 expenditures but were budgeted to account for 37 percent of the original approved budget.

Table 5 2011 Cost per Participant, Budgeted and Actual

	Original Budget	Revised Budget	Actual
Contractor Administration	\$236,268	\$418,900	\$195,543
Customer Incentive	\$562,544	\$394,320	\$30,288
Promotion	\$60,000	\$60,000	\$9,294
Evaluation	\$37,340	\$37,340	\$17,189
Total Cost (\$)	\$896,152	\$910,560	\$252,314
Participation	88	88	18
Cost (\$) per Participant	\$10,184	\$10,347	\$14,017

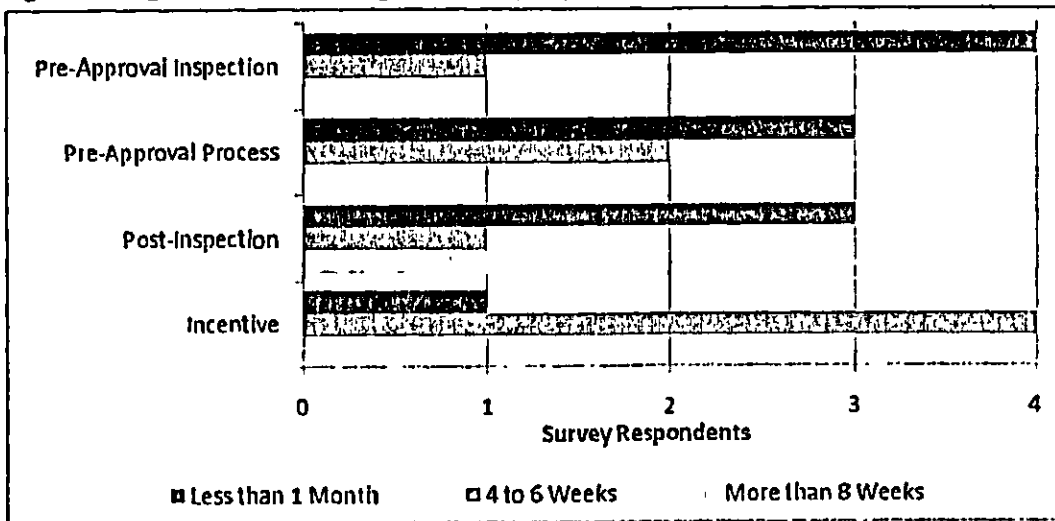
Based on the project applications provided by KEMA:

- Pre-Approval Inspections
 - o 50 percent were conducted before the pre-approval application was submitted, on average 35 days prior to the application submittal.
 - o 6 percent of inspections were conducted on the same date.
- Post-Approval Inspections
 - o 22 percent were conducted before the final application was submitted, on average 5 days prior to the application submittal.
 - o 28 percent of inspections were conducted on the same date.

The participant survey separated the program processes into 4 categories. Figure 3 presents the length of time that each program process took based on the participant survey.

- 1) Pre-approval inspection: application submittal until the pre-approval inspection is conducted;
- 2) Pre-approval process: application submittal until the customer receives pre-approval confirmation;
- 3) Post-inspection: final application submittal until the post-installation inspection is conducted;
- 4) Incentive: final application submittal until the customer receives the rebate.

Figure 3 Program Processes, Length of Time (n=5)



4.3 Program Marketing

The Commercial Incentive Program was marketed as part of a broader initiative under Kentucky Power's GRID SMART® Programs. KEMA and Kentucky Power marketed the program to commercial customers as well as business organizations, contractors and local government officials. Marketing and promotional efforts increased when KEMA hired a local representative.

The Commercial Incentive Program was promoted through:

- **Direct Customer Contact.** KEMA's local representative had in-person meetings with eligible customers to discuss the program and application process. The representative targeted specific market segments, particularly the largest users such as schools, government buildings and large general service account holders.
- **Trade Ally Outreach.** The KEMA representative promoted the program to Trade Allies, businesses and individuals likely to have direct contact with eligible customers. In turn, the Trade Allies were encouraged to use the Kentucky Power program as a marketing tool. KEMA purchased lists of Kentucky-licensed HVAC contractors and received names from distributors and manufacturers. The representative promoted the program at the Commercial Incentive Program kick-off meeting and presentations at business/civic organizations and Chamber of Commerce meetings.
- **Customer Service.** KEMA received customer requests for information, services and other inquiries through their dedicated program email and customer service number.⁹ The KPCO Customer Services Group provided program information to eligible customers.

According to KEMA, the KPCO Customer Services Group has referred between 10 and 20 percent of program participants.

- **Newspaper Advertisements** were run over a four week period.
- **Internet.** Kentucky Power marketed the program through kentuckypower.com/save.

Table 6 Number of Trade Ally Presentations/Meetings by Month

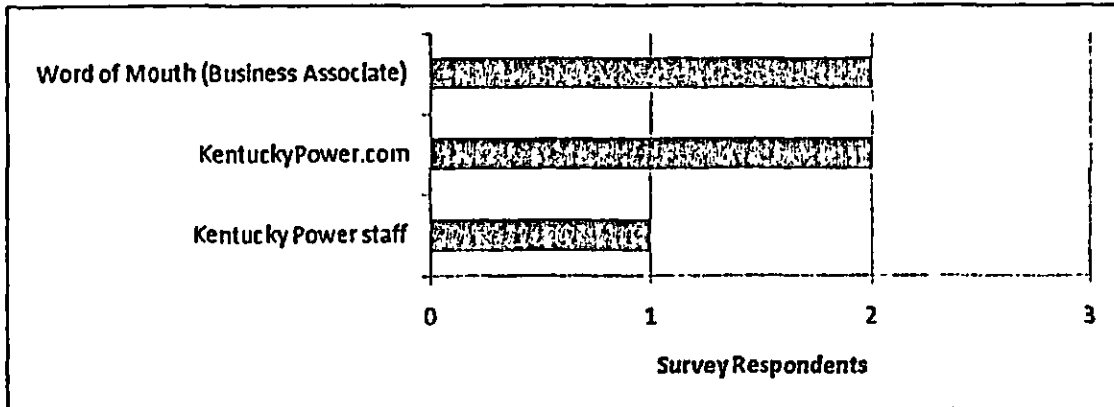
	October 2011	November 2011	December 2011
Business and Civic Organizations	7	7	3
Commercial Accounts	12 Schools Fiscal Courts 6 Municipalities	16 Public Accounts 34 Private Accounts	6

4.3.1 Program Awareness

According to survey respondents, customers most often learned of the program from a business associate or the Kentucky Power website. Approximately 60 percent of participating customers met with the KEMA local representative prior to submitting the pre-approval application. The representative conducted a pre-approval inspection during 67 percent of the initial customer meetings.

⁹ Commercial Incentive Program customer service email is kpcommercialincentive@kema.com and number is 1-855-878-6207.

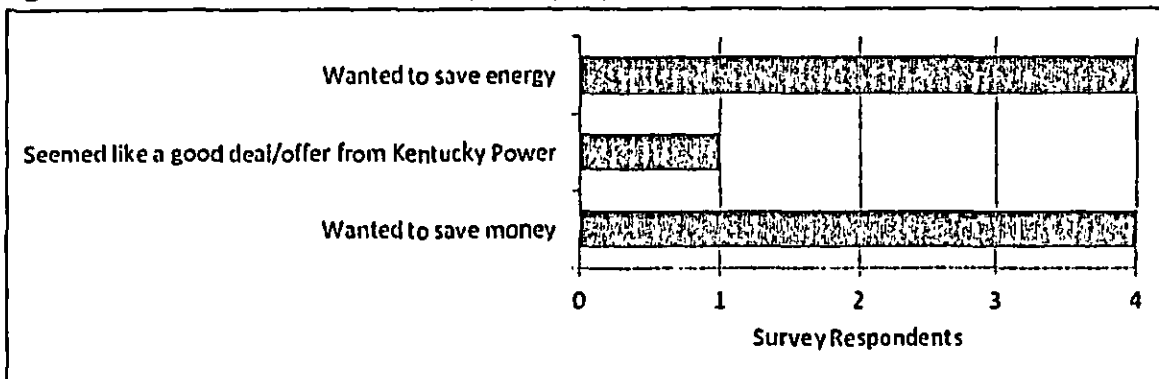
Figure 4 How Customers First Learned of the Program (n=5)



4.3.2 Motivation for Participation

Participating customers surveyed cited that the primary reason for participating in the Commercial incentive Program was saving energy and money. Additionally, 20 percent of participating customers noted that the program seemed like a good deal/offer from Kentucky Power.

Figure 5 Customer Motivation for Participation (n=5)



4.4 Program Tracking & Incentive Processing

Kentucky Power submitted bi-annual status reports to the Kentucky PSC with each program's progress to-date, including participation, estimated energy and demand savings, and budget. The utility also reviewed actual, projected and summary program data with the DSM Collaborative on a quarterly basis.

KEMA's in-house program tracking system is comprised of a single server database that contains 40 to 50 tables of customer application data. The system tracked the individual that reviewed, inspected and approved the application as well as the status of the project from pre-application through payment of the incentive. Kentucky Power program staff reviewed final customer applications and approved incentives through KEMA's Dashboard, a web-based interface of the tracking system. KEMA supplied KPCO with periodic updates and data extracts. Monthly operations reports summarized:

- The local representative promotional activities.

- Total projects, incentives, and energy and demand savings by project type (pending, paid and cancelled).
- Program performance (incentives, energy and demand savings) compared to the goal. Project performance was tracked by active, reserved, final, paid and cancelled projects.

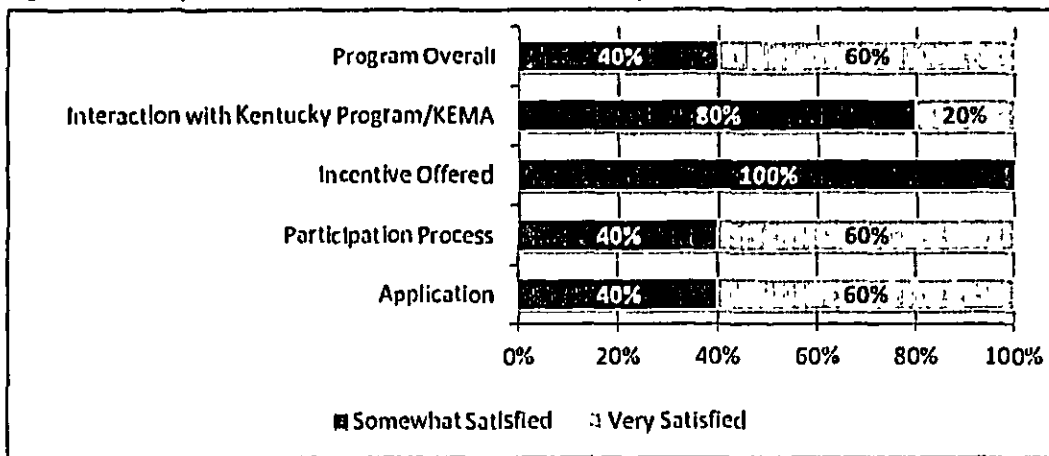
KEMA collects the following data on the customer application:

- **Customer Information:** business name, account number, address (mailing and installation), tax status, business type, tax status, square footage of building, building operating hours, owner/renter.
- **Customer Contact:** contact name, title, phone, fax, email.
- **Contractor Information:** company name, contact name, title, address, fax, email.
- **Incentives Requested:** total incremental cost, total Incentives requested.
- **Prescriptive Equipment Information:** equipment type, number of units, total incentive, etc.
- **Custom Equipment Information:** existing equipment, new equipment, savings, measure cost, measure life, annual operating hours.

4.5 Program Satisfaction

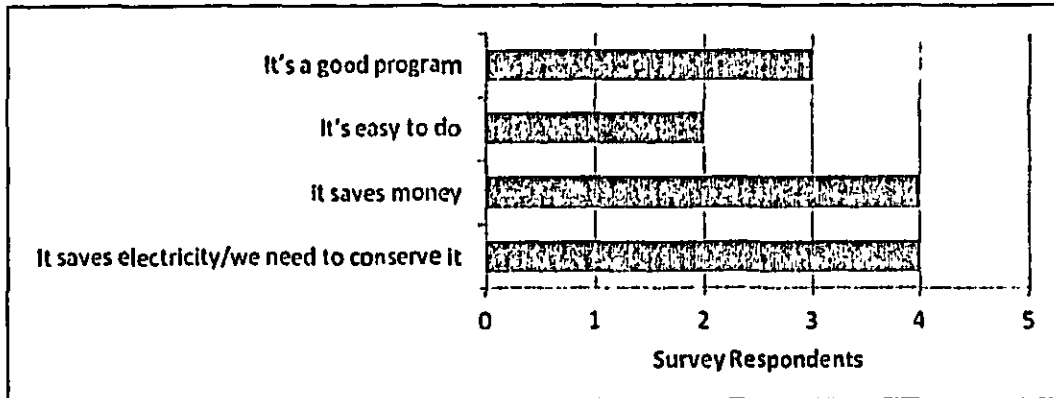
Overall, participants were satisfied with the Commercial Incentive Program. Based on the customer participant survey, the customer interaction with KEMA and Kentucky Power could be Improved slightly.

Figure 6 Participant Satisfaction with the Program (n=5)



One-hundred (100) percent of participating customers surveyed would recommend the program to others. Forty (40) percent had already recommended the program. Participants noted that the Commercial Incentive Program saves electricity and money and that it is a good program. Participating customers surveyed noted that the KEMA representative was very helpful.

Figure 7 Reasons Participant Would Recommend the Program (n=5)



5. Impact Evaluation Findings

Impact evaluations assess the cost-effectiveness of a DSM program and verify the energy and demand savings directly associated with it.

5.1 Gross Energy and Demand Savings

AEG determined the gross energy and demand savings of each individual project based on the International Performance Measurement and Verification Protocols (IPMVP) Option A. Option A involves engineering calculations of gross savings using historical data. Engineering calculations referenced from the *New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts.

The equations used to determine gross energy and demand impacts are:

$$\text{Gross Energy Impacts} = \text{units} \times \Delta \text{Watts} \times \text{Yearly Operating Hours}$$

$$\text{Gross Demand Impacts} = \text{units} \times \Delta \text{Watts} \times \text{Coincidence Factor}$$

Where:

Units = quantity of bulbs/fixtures

Δ *Watts* = wattage difference between efficient bulb/fixture installed and standard bulb/fixture

Yearly Operating Hours = number of hours lighting used per year, by building type

Coincidence Factor

Table 7 Total Gross Demand and Energy Savings, by Project

Measure	Gross Summer Savings (kW)	Gross Winter Savings (kW)	Gross Energy Savings (kWh)
T-12 to T-8 Conversion	16.64	16.64	127,695
LED Fixtures and Lamps	5.67	5.67	11,079
PSMH Conversion	9.70	9.70	21,214
HID to CDM Conversion	4.06	4.06	8,879
HID to LED Conversion	2.28	2.28	4,975
T-12 to T-8 Conversion	0.92	0.92	3,463
T-12 to T-8 Conversion	0.92	0.92	3,463
T-12 to T-8 Conversion	29.12	29.12	143,834
Halogen to LED Conversion	1.53	1.53	6,191
Halogen to LED Conversion	3.05	3.05	12,382
Halogen to LED Conversion	5.61	5.61	22,774
Halogen to LED Conversion	2.94	2.94	11,940
HID to CDM Conversion	1.12	1.12	2,449
T-12 to T-8 Conversion	0.07	0.07	272
T-12 to T-8 Conversion	0.17	0.17	690
T-12 to T-8 Conversion	0.11	0.11	462
PSMH Conversion	5.00	5.00	10,935
HID to T-5HD Conversion	8.30	8.30	18,161
Program Total	97.22	97.22	410,859

5.2 Net Energy and Demand Savings

Net energy and demand savings are the gross savings attributable to the Commercial Incentive Program, not accounting for impacts resulting from other influences such as free ridership or spillover. Net impacts were calculated by applying a net-to-gross ("NTG") factor to gross impacts.

$$NTG \text{ Ratio} = 1 - \text{Free Ridership} + \text{Spillover}$$

Free ridership and spillover calculations are described in the preceding subsections. Based on the process evaluation survey results, AEG has determined the net-to-gross ratios to be 77 percent. Table 8 presents the net demand and energy savings achieved.

Table 8 2011 Net Demand and Energy Savings, by Project

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)
T-12 to T-8 Conversion	77%	12.81	12.81	98,325
LED Fixtures and Lamps	77%	4.37	4.37	8,531
PSMH Conversion	77%	7.47	7.47	16,335
HID to CDM Conversion	77%	3.13	3.13	6,837
HID to LED Conversion	77%	1.75	1.75	3,831
T-12 to T-8 Conversion	77%	0.71	0.71	2,667
T-12 to T-8 Conversion	77%	0.71	0.71	2,667
T-12 to T-8 Conversion	77%	22.42	22.42	110,752
Halogen to LED Conversion	77%	1.18	1.18	4,767
Halogen to LED Conversion	77%	2.35	2.35	9,534
Halogen to LED Conversion	77%	4.32	4.32	17,536
Halogen to LED Conversion	77%	2.27	2.27	9,194
HID to CDM Conversion	77%	0.86	0.86	1,886
T-12 to T-8 Conversion	77%	0.05	0.05	209
T-12 to T-8 Conversion	77%	0.13	0.13	531
T-12 to T-8 Conversion	77%	0.09	0.09	356
PSMH Conversion	77%	3.85	3.85	8,420
HID to T-5HO Conversion	77%	6.39	6.39	13,984
Program Total		74.86	74.86	316,362

5.2.1 Free Ridership

Free ridership estimates the efficient measures that would have been purchased and installed without the Kentucky Power incentive. Three participating customer questions were designed to determine the portion of a customer's savings that could be attributed to free ridership.

Question 1. If you had not received the Kentucky Power incentive, how likely is it you would have purchased the EXACT SAME equipment?

The more likely the customer was to have purchased and installed the exact same equipment without the Kentucky Power incentive, the higher the probability that the customer was a free rider. For example, if a customer responded 'Very likely,' free ridership probability ranged from 50 to 100 percent.

Question 2. If you had not received the Kentucky Power incentive, how likely is it you would have purchased the EXACT SAME QUANTITY of equipment?

The more likely the customer was to have purchased the exact same quantity of equipment without the Kentucky Power incentives, the higher the probability that the customer was a free rider.

Question 3. How important was the Kentucky Power incentive in your decision to purchase and install the efficient equipment?

A customer that places high importance on the Kentucky Power incentive in their decision to purchase and install efficient equipment was not a free rider. The higher the importance of the Kentucky Power

Incentive on the customer's decision to purchase and install the efficient equipment, the lower the probability that the customer was a free rider.

Each customer was assigned a value based on the probability that there was free ridership. The customer survey responses for Question 2 validated the responses to Question 1. Therefore, Question 2 was not included in the probability scoring. Table 9 presents the free ridership probability scoring mechanism for Questions 1 and 3.

Table 9 Free Ridership Probability Scores, Questions 1 and 3

Q1 Response	Q3 Response	Min	Max	Estimate
Not Likely	Very Important	0%	0%	0%
Not Likely	Somewhat Important	0%	20%	10%
Not Likely	Slightly Important	0%	30%	15%
Not Likely	Not Important	0%	40%	20%
Somewhat Likely	Very Important	20%	50%	35%
Somewhat Likely	Somewhat Important	20%	60%	40%
Somewhat Likely	Slightly Important	20%	70%	45%
Somewhat Likely	Not Important	20%	80%	50%
Very Likely	Very Important	50%	100%	75%
Very Likely	Somewhat Important	60%	100%	80%
Very Likely	Slightly Important	70%	100%	85%
Very Likely	Not Important	80%	100%	90%

The weighted mean of the customer probabilities resulted in a free ridership estimate of 29 percent. Therefore, 29 percent of businesses that purchased and installed efficient equipment through the Commercial Incentive Program would have done so without the KPCO incentive.

Table 10 Free Ridership Weighted Probability

Free Rider Probability	Observations	Weight	Weighted Value
0%	1	0.20	0%
35%	3	0.60	21%
40%	1	0.20	8%
Free Ridership Estimate			29%

5.2.2 Spillover

Spillover estimates the additional efficient measures purchased and installed due to the influence of the Commercial Incentive Program. Two participating customer questions were designed to determine the portion of a customer's savings that could be attributed to spillover.

Question 1. Since receiving the Kentucky Power incentive, has your business purchased additional efficient equipment?

If a participating customer purchased additional efficient equipment since receiving the Kentucky Power incentive, there was participant spillover. Therefore, if a participating customer responded 'No,' the probability that there was spillover was 0 percent.

Question 2. What influence did the Kentucky Power program have on the decision?

If a participating customer purchased additional efficient equipment due to the influence of the Kentucky Power programs, there was participant spillover. The greater the influence of Kentucky Power program, the higher the participant spillover.

Each customer was assigned a value based on the probability that there was spillover. Table 11 presents the spillover probability scoring mechanism.

Table 11 Spillover Probability

Q1 Response	Q2 Response	Min	Max	Estimate
No		0%	0%	0%
Yes	Had no influence	0%	20%	10%
Yes	Had some influence	20%	40%	30%
Yes	Had a large influence	50%	70%	60%

The weighted mean of retailer probabilities resulted in a spillover estimate of 6 percent. Therefore, 6 percent of businesses that purchased and installed efficient equipment outside of the Commercial Incentive Program were influenced by the KPCO program.

Table 12 Spillover Weighted Probability

Spillover Probability	Observations	Weight	Weighted Value
0%	4	0.80	0%
30%	1	0.20	6%
Spillover Estimate			6%

5.3 Program Site Inspections and Performance Verification

AEG performed site inspections and installation verifications on eight fully installed projects to ensure proper installation, perform QA/QC and verify application information of the installed equipment.

Installations of lighting fixtures, lamps and controls were inspected with building types including high schools, medical centers, manufacturing facilities, exhibit halls, elementary schools, and retail space. The sites inspected provided a representative sample of all program projects. Proper installation verification was confirmed at all locations. Table 13 below describes the building type and general project description for sites visited.

Table 13 Installation Verification Site Visits, 2011

Building Type	Project Description
High School	Lighting: HID to T-5 HO
Medical Center	Lighting: T-12 to T-8 Conversion
Manufacturing	Lighting: T-12 to T-8 Conversion
High School	Lighting: HID to CDM Conversion
Exhibit	Lighting: LED Fixtures and Lamps
Retail	Lighting: T-12 to T-8 Conversion
Elementary School	Lighting: PSMH Conversion
Retail	Lighting: T-12 to T-8 Conversion

5.4 Program Cost-Effectiveness

Cost-effectiveness analysis compares the costs and benefits of efficient equipment with those of baseline (non-efficient) equipment. Cost-effectiveness analysis indicates whether the efficient technology(s) improve a customer's financial position, decrease overall energy costs to ratepayers, or raise society's well-being. A program is considered cost-effective if the benefit-cost ratio is greater than one (1.0).

AEG analyzed the cost-effectiveness of the Commercial Incentive Program utilizing four standard cost-effectiveness tests taken from the California Standard Practices Manual.¹⁰ Each test analyzes cost-effectiveness from a different perspective and answers a separate question:

- **Participant Cost Test:** Compares customer costs and benefits of installing the measure. Will the participant benefit over the life of the measure?
- **Program Administrator Cost Test (Utility Cost Test):** Comparison of program administrator costs to supply-side resource benefits. Will utility costs to save energy be less than utility costs to deliver the same amount of energy?
- **Ratepayer Impact Measure:** Measures the impact of the DSM program on utility rates if rates were to be adjusted to account for the program. Comparison of utility program costs and bill reductions associated with energy savings to supply-side resource benefits. Will customer rates increase?
- **Total Resource Cost Test:** Comparison of program administrator and customer costs to utility resource savings. Will the total costs of energy in the utility service territory decrease?

Results from the Impact evaluation, utilizing IPMVP best practices, are utilized in the four cost-effectiveness tests taken from the California Standard Practices Manual.

Kentucky Power specific inputs, including avoided costs, discounts rates, participation and incentives, were used to conduct the cost-effectiveness analysis. Bencost, an updated version of a public domain model that AEG customized for Kentucky Power, was utilized to perform the cost-effectiveness modeling (see Appendix B). Bencost is an input-output model that calculates all four cost-effectiveness

¹⁰ The California Standard Practices Manual details cost-effectiveness guidelines and procedures for standardized cost-effectiveness evaluations.

tests. All program costs and benefits are discounted to present-day dollar values in order to accurately compare future benefits with current costs.

Table 14 Program Cost-Effectiveness Results

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	0.60	\$247,152	\$147,433	-\$99,718
Ratepayer Impact Measure Test	0.30	\$485,602	\$147,433	-\$338,169
Participant Test	15.52	\$12,563	\$195,024	\$182,461
Total Resource Cost Test	0.63	\$234,589	\$147,433	-\$87,156

It needs to be noted that very low avoided costs, especially the extremely low capacity costs in the Kentucky Power service territory, have a significant negative impact on the program's cost-effectiveness. The 2012 Kentucky Power capacity cost is \$6/kW-year, compared to a PJM average of over \$100/kW-year. This cost differential partially accounts for the low benefit-cost ratios.

The Commercial Incentive Program's cost-effectiveness was greatly affected by the low participation rates and comparatively high program administrative costs. In 2011, 18 projects were rebated and \$222,026 program administrative dollars were spent. 2011 participation goals were 88 and the program administrative budget (non-incentives) was \$333,608. If planned participation levels of 88 rebated projects were achieved and projects save an average of 25,000 kWh and 5.5 kW, the program would be cost-effective and pass the TRC test. Table 15 provides the cost-effectiveness if fully planned program participation was achieved, assuming actual 2011 expenditures.

Alternatively, if program administrative costs were set equal to the ratio of original approved incentive costs (for example, if program incentives were \$250,000 program administrative costs would be set at \$250,000) and projects save an average of 25,000 kWh and 5.5 kW, the program would be cost effective and pass the TRC test. The scenario assumes actual 2011 participation, but program participation would be irrelevant if administrative costs were capped to be equal to incentive costs. Table 16 provides the cost-effectiveness if program administration costs are reduced to equal incentive costs.

Going forward, it is vital that either participation goals be met or program administrative costs be reduced for the Commercial Incentive Program to reach acceptable cost-effectiveness levels.

Table 15 Cost-Effectiveness Results If Planned Participation Achieved, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	0.86	\$910,560	\$778,690	-\$131,870
Ratepayer Impact Measure Test	0.36	\$2,187,372	\$778,690	-\$1,408,682
Participant Test	6.61	\$197,160	\$1,304,060	\$1,106,900
Total Resource Cost Test	1.09	\$713,400	\$778,690	\$65,290

Table 16 Cost-Effectiveness Results if Program Administration Costs Reduced, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	0.99	\$788,640	\$778,690	-\$9,950
Ratepayer Impact Measure Test	0.38	\$2,065,452	\$778,690	-\$1,286,762
Participant Test	6.61	\$197,160	\$1,304,060	\$1,106,900
Total Resource Cost Test	1.32	\$591,480	\$778,690	\$187,210

Although the Commercial Incentive Program did not have a cost-effectiveness ratio greater than 1.0, the entire portfolio being evaluated is cost-effective in 2011.¹¹ Table 17 provides the cost-effectiveness for the 2010-2012 Demand Side Management Program Portfolio being evaluated by AEG.

Table 17 Kentucky Power Portfolio Cost-Effectiveness Results, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	2.13	\$720,104	\$1,533,730	\$813,626
Ratepayer Impact Measure Test	0.44	\$3,507,956	\$1,533,730	-\$1,974,227
Participant Test	5.13	\$486,703	\$2,499,101	\$2,012,397
Total Resource Cost Test	1.57	\$975,217	\$1,533,730	\$558,512

6. Key Findings and Recommendations

6.1 Summary of Key Findings

The primary objectives of the Commercial Incentive Program are to increase the market share of commercial grade high efficiency technologies sold through market channels, increase the installation rate of high efficiency technologies in commercial facilities, and improve operating efficiency of existing long life equipment to insure peak operating efficiency.

6.1.1 Program Performance Indicators

In 2011, eighteen (18) lighting projects were completed through the Commercial Incentive Program at a higher cost per participant than originally budgeted due to high fixed costs independent of program participation. Sixteen (16) projects were cancelled, primarily resulting from participants purchasing and/or installing equipment prior to beginning the participation process. Kentucky Power achieved approximately 20 percent of the 88 participant goal.

Table 18 2011 Actual versus Budgeted Participation and Expenditures

	Actual	Original Budget	Revised Budget
Participation	18	88	88
Expenditures	\$252,314	\$896,152	\$910,560

¹¹ The 2010-2012 Demand Side Management Program Portfolio being evaluated includes the Small Commercial Heat Pump/Air Conditioner Program, Residential Efficient Products Program, Commercial Incentive Program, and Residential and Small Commercial HVAC Diagnostic and Tune-Up Program.

The Commercial Incentive Program was approved in October 2010. KEMA implemented the program from its headquarters in Michigan until a local representative was hired in September 2011. Program participation was slow until October 2011, not long after the local representative was retained.

6.1.2 Program Tracking

The program tracking and monitoring system accurately tracks program data. However, based on the project applications provided by KEMA:

- 50 percent of pre-approval inspections were conducted before the pre-approval application was submitted, on average 35 days prior to the application submittal. 6 percent of inspections were conducted on the same date.
- 22 percent of post-installation inspections were conducted before the final application was submitted, on average 5 days prior to the application submittal. 28 percent of inspections were conducted on the same date.

6.1.3 Program Awareness and Marketing Strategies

The marketing strategy for the program included promoting the program directly to both eligible customers as well as business organizations, contractors and local government officials that were expected to promote the program to eligible customers.

KPCO Customer Services Group provided program information to eligible customers. According to KEMA, the Customer Services Group referred between 10 and 20 percent of program participants. The Trade Ally kick-off meetings held by KEMA were poorly attended. However, the KEMA representative met with numerous business and civic organizations as well as eligible customers in late 2011.

According to survey respondents, customers most often learned of the program from a business associate or the Kentucky Power website. Approximately 60 percent of participating customers met with the KEMA local representative prior to submitting the pre-approval application.

6.1.4 Best Practices

Kentucky Power's program design and processes are largely consistent with best practices for similar energy efficiency programs. Depending on the design of the commercial energy efficiency program, incentives may be direct (i.e. rebates and discounts) or indirect (i.e. manufacturer and/or retailer buy-downs). Direct incentives are typically a range per measure or a percentage of project costs. For example, incentives for fluorescent fixtures typically range between \$1 and \$200 per unit or between 30 and 50 percent of project cost. Custom incentives range between \$0.03 and \$0.75 per kWh saved, depending on the type and cost of the project. Incentives for large scale projects are typically capped at a percentage of the incremental cost.¹²

¹² National Action Plan for Energy Efficiency (2010). *Customer Incentives for Energy Efficiency Through Program Offerings*. Prepared by William Prindle, ICF International, Inc. <www.epa.gov/eeactionplan>

The challenges posed by lack of information are ubiquitous to energy efficiency programs. Investment in education and outreach will boost awareness of the potential benefits of energy efficiency. Successful marketing strategies can increase program participation.

6.1.5 Verify Program Impacts

The net-to-gross ratio for the Commercial Incentive Program is estimated 77 percent, with 29 percent free ridership and 6 percent spillover. Program cost-effectiveness was greatly affected by the low participation rates and high program administration, marketing and evaluation costs.

If the planned participation levels of 88 completed projects were achieved and projects save an average of 25,000 kWh and 5.5 kW, the program would be cost-effective and pass the TRC test, assuming actual 2011 expenditures. Alternatively, if program administrative costs were set equal to the ratio of original approved incentive to administrative costs and projects save an average of 25,000 kWh and 5.5 kW, the program would be cost effective and pass the TRC test, assuming actual 2011 participation. Going forward, it is vital that either participation goals be met or program administrative costs be reduced for the Commercial Incentive Program to reach acceptable cost-effectiveness levels.

Table 19 2011 Energy Savings

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Program Total	77%	74.86	74.86	316,362	0.63

Site inspections and installation verifications were performed on eight fully installed projects to ensure proper installation. Proper installation verification was confirmed at all locations.

6.2 Recommendations

AEG has several recommendations on how to improve the program. These include:

6.2.1 Implementation Contractor to Increase Local Staff

AEG recommends that KEMA increase the local staff by at least one employee. Four (4) KEMA staff members worked remotely from Michigan until the local representative was hired in September 2011. While participation increased significantly between October and December, the program was promoted primarily through direct customer contact and Trade Ally outreach. AEG recommends that KEMA continue to utilize direct customer contact and Trade Ally outreach as the primary promotional activities. However, these promotional activities require considerable amounts of time to be successful. Because of the large geographic area of the Kentucky Power service territory, KEMA needs on-site staff in both the northern and southern portion of Kentucky Power's territory. An additional local representative assisting with promotional efforts should increase participation and improve overall efficiency, particularly as the new program components are offered to customers.

6.2.2 Streamline Program Processes

AEG recommends that KEMA improve and streamline the participation process. The Commercial Incentive Program participation process was designed to include the following steps:

- 1) Customer/contractor submits the pre-approval application.
- 2) KEMA reviews the application and conducts a pre-approval inspection. If approved, the customer receives a letter confirming the funding reservation and detailing the terms and conditions of the program.
- 3) The approved equipment is installed and the customer/contractor submits the final application.
- 4) KEMA reviews the application and conducts a post-installation inspection. If approved, the customer incentive is processed.

The program does not operate as designed. In 2011, 50 percent of pre-approval inspections were conducted before the pre-approval application was submitted and 22 percent of post-installation inspections were conducted before the final application was submitted. KEMA is contracted to provide customer technical support to facilitate the pre-approval application, as needed. Therefore, the KEMA local representative may be conducting the pre-approval inspection while providing technical support.

AEG recommends that the pre-approval inspection be conducted no sooner than the day the pre-approval application is submitted to KEMA. The KEMA representative may provide technical assistance to the customer/contractor for the application and conduct the inspection on the same day, but the application must be submitted to KEMA that day. The post-installation inspection should be conducted after the final application has been received and reviewed by KEMA.

AEG recommends that the program be modified such that KEMA conducts random inspections of at least 15 to 20 percent of pre- and post-installation projects, to be adjusted depending upon the inspection findings. The inspections are to be random; the pre- and post-installation inspections are not necessarily to be conducted on the same project. Depending upon the inspection findings, Kentucky Power and KEMA should reassess the need for pre-installation inspections.

AEG recommends that Kentucky Power and KEMA examine the customer incentive reservation period. Currently, customer incentives are reserved for 180 days, during which time the project must be completed. Rather than one consistent reservation period, the length of the incentive reservation may be based on the type and difficulty of the project. For example, a simple lighting retrofit may have a reservation of 90 days while a project that undertakes lighting and HVAC may have 120 days.

6.2.3 Leverage Express Program

Program cost-effectiveness was greatly affected by low participation rates and high program administration, marketing and evaluation costs. Going forward, it is vital that either participation goals be met or program administrative costs be reduced for the Commercial Incentive Program to reach acceptable cost-effectiveness levels.

In 2012, the Commercial Incentive Program will consist of three programs: Prescriptive and Custom Incentives (current program), Express Program, and the New Construction Program. The Express Program provides incentives to non-residential customers with an average demand of less than 100 kW that have a participating contractor install efficient measures. The New Construction Program provides incentives to non-residential customers that are above the current building energy code for new additions, major renovations or new facilities.

AEG recommends that KEMA leverage the new Kentucky Power Express Program and New Construction Program to increase program awareness. KEMA should encourage sub-contractors involved in the Express Program to promote prescriptive and custom incentives to eligible customers. Additionally, KEMA should promote the prescriptive and custom incentives to customers that participate in the New Construction Program.

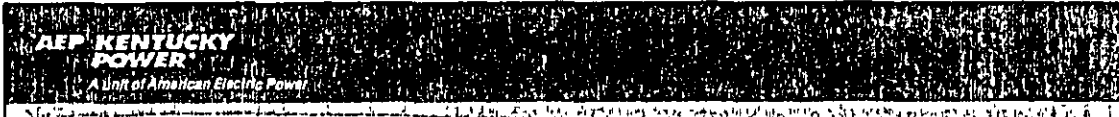
6.2.4 Express Program Incentives

AEG reviewed the Express Program, anticipated for mid-2012. The program will provide incentives to non-residential customers with an average demand of less than 100 kW that have a participating contractor install efficient measures. KPCO service territory comprises approximately 26,970 commercial and public authority accounts with a peak demand of 50 kW or less.¹³

AEG recommends that KPCO consider increasing incentives to 60 to 70 percent of the installed equipment costs. Incentives are currently capped at 50 percent of the incremental material costs, the same as the current Commercial Incentive Program prescriptive and custom incentives. However, direct install programs typically offer small non-residential customers higher incentives and, occasionally, financing for the remaining portion of the installation cost.

¹³ Case No. 2010-00198.

Appendix A. Participating Customer Survey Guide



Kentucky Power is conducting an evaluation of its Commercial Incentive Program. The program provides financial incentives to business customers who implement qualified energy-efficient improvements and technologies.

We would like to get your feedback and impressions of the program. The survey is for research purposes and all responses will remain confidential.

For the survey, click [HERE](#)

Please submit responses by the close of business Friday, March 30th.

Contact Erin Coughlin at (732) 447-1359 with any questions.
Thank you for your participation!

Business Name

Name

Phone Number

1. How would you classify your business?

- a) School **(2)**
- b) Office
- c) Medical
- d) Retail **(1)**
- e) Manufacturing
Arena
Rebate Services

Program Participation

2. What type of incentive did you receive?

- a) Prescriptive **(1)**
- b) Custom **(2)**
- c) Both **(1)**

3. What kind of efficient technology did you have installed?

- a) Lighting **(5)**
- b) HVAC
- c) Refrigeration

4. Did you hire a contractor to install the equipment?

- a) Yes (1)
 - b) No (4)
5. How did you first become aware of the Commercial Incentive Program?
- a) Kentucky Power (1)
 - b) Program Implementer (KEMA)
 - c) KentuckyPower.com
 - d) gridSMART (2)
 - e) News Article
 - f) Word of Mouth (Business Associate) (2)
 - g) Chamber of Commerce
 - h) Community event/meeting/presentation
6. Why did you decide to participate in the program?
- a) Contractor recommended It
 - b) Wanted to save money (4)
 - c) Seemed like a good deal/offer from Kentucky Power (1)
 - d) Wanted to save energy (4)
7. Did you meet with a Kentucky Power representative (KEMA) prior to submitting the pre-approval application?
- a) Yes (continue to next question) (3)
 - b) No (skip to question 9) (2)
- B. Did the Kentucky Power representative (KEMA) conduct the pre-approval inspection during the visit?
- a) Yes (2)
 - b) No (1)
9. About how long did it take for the following activities:

	Less than 1 Month	4 to 6 Weeks	6 to 8 Weeks	More than 8 Weeks
a) Pre-approval inspection, from application submittal until you received the pre-approval inspection	4	1		
b) Pre-approval process, from application submittal until you received pre-approval confirmation	3	2		
c) Post-inspection, from final application submittal until you received the post-inspection	3	1		1
d) Receive the incentive, from final application submittal until you received the rebate?	1	4		

e) Comments

KEMA representative was and is very helpful

Customer Satisfaction

10. Please rate your satisfaction with the following program components on a five-point scale, where "5" means "Very Satisfied" and "1" means "Very Dissatisfied." How satisfied are you with the:

	Not Satisfied	2	3	4	Very Satisfied
a) Application				2	3
b) Participation Process				2	3
c) Incentive offered				5	
d) Interaction with Kentucky Power/KEMA				4	1
e) Program overall				2	3

11. Based on your experience with the program, would you recommend this program to others?

- a) Yes (5)
b) No
12. Why do you say that?
a) It saves electricity/we need to conserve it (4)
b) It saves money (4)
c) it's easy to do (2)
d) It's a good program (3)
e) I have recommended it (2)
f) People I recommended it to haven't been able to get into the program
13. How could the program be improved?
It could be improved by offering very low or no interest loans to purchase the equipment needed in addition to the rebates.
- Free Ridership/Spillover
14. Prior to learning about this program, did you have specific plans to install efficient equipment?
a) Yes (continue to next question) (5)
b) No (skip to question 17)
15. Was it necessary to change your plans to qualify for the program?
a) Yes (continue to next question) (1)
b) No (skip to question 17) (3)
16. What changes were made (for example: quantity and type of equipment, timing, etc)?
Fluorescent T12 to T8 8 Fixtures
Changed lighting in gyms and parking lots. Reduce the wattage of bulbs being used to a lesser wattage.
This program made the time span to accomplish the plans much shorter. The equipment and other purchases must be made in a shorter time span which puts an additional burden on budgets that are already stressed.
17. How important was the Kentucky Power incentive in your decision to purchase and install the efficient equipment?
a) Very important (4)
b) Somewhat important (1)
c) Only slightly important
d) Not important at all
18. If you had not received the Kentucky Power incentive, how likely is it you would have purchased the EXACT SAME equipment?
a) Very likely
b) Somewhat likely (4)
c) Not likely (1)
19. If you had not received the Kentucky Power incentive, how likely is it you would have purchased the EXACT SAME QUANTITY of equipment?
a) Very likely
b) Somewhat likely (4)
c) Not likely (1)
20. Since receiving the Kentucky Power incentive, has your business purchased additional efficient equipment?
a) Yes (continue to next question) (1)
b) No (skip to question 22) (4)

21. What type of equipment has your business purchased?

TB Ballast and Lamps

22. What influence did the Kentucky Power program have on the decision?

- a) Had no influence **(1)**
- b) Had some influence **(4)**
- c) Had a large influence

Appendix B. Cost-Effectiveness Analysis Inputs

Table B1: General Bencost Model KPCO Rate Inputs

BENEFIT COST TEST FOR CONSERVATION PROGRAMS – Cost-Effectiveness Analysis			
Company:		Kentucky Power Company	
General Inputs			
Input Data			Source
Electric Retail Rate (\$/kWh) =		\$0.98589	Residential
		\$0.97492	Commercial
		\$0.91001	All Classes
Variable O&M (\$/kWh) =		\$0.00000	
	Escalation Rate =		3.00%
Environmental Damage Factor =		\$0.0087	
	Escalation Rate =		3.00%
Participant Discount Rate =		15.00%	KPCO Data Request from AEP Load Research
Utility Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
Social Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
General Input Data Year =		2011	
Project Analysis Year 1 =		2011	
Primary Energy Line Losses		5.28%	KPCO Data Request from AEP Load Research
Primary Peak Line Losses		7.40%	KPCO Data Request from AEP Load Research
Kentucky Power NTG		0%	Kentucky Power Meeting
Residential and Small Commercial Energy Losses		8.7%	KPCO email dated 4/20/12 from Alan Graves
Residential and Small Commercial Peak Losses		10.7%	KPCO email dated 4/20/12 from Alan Graves

TABLE B2: BENCOST MODEL COMMODITY COST INPUTS¹⁴

Year	Avoided Energy Commodity Cost (\$/kWh)	Avoided Capacity Cost (\$/kW-year)	Avoided Electricity Retail Rate (\$/kWh)
2011	\$0.0395	\$40.15	\$0.080
2012	\$0.0403	\$6.01	\$0.080
2013	\$0.0399	\$10.12	\$0.082
2014	\$0.0432	\$45.99	\$0.084
2015	\$0.0447	\$124.83	\$0.086
2016	\$0.0510	\$124.83	\$0.088
2017	\$0.0520	\$69.30	\$0.090
2018	\$0.0528	\$80.15	\$0.092
2019	\$0.0540	\$89.71	\$0.094
2020	\$0.0547	\$97.91	\$0.096
2021	\$0.0561	\$104.70	\$0.098
2022	\$0.0658	\$110.03	\$0.100
2023	\$0.0670	\$113.83	\$0.103
2024	\$0.0691	\$116.04	\$0.105
2025	\$0.0707	\$118.13	\$0.108
2026	\$0.0716	\$120.25	\$0.110
2027	\$0.0731	\$122.42	\$0.113
2028	\$0.0746	\$124.62	\$0.115
2029	\$0.0761	\$126.86	\$0.118
2030	\$0.0779	\$129.15	\$0.120
2031	\$0.0788	\$130.70	\$0.123
2032	\$0.0788	\$132.26	\$0.126
2033	\$0.0788	\$133.85	\$0.129
2034	\$0.0788	\$135.46	\$0.132
2035	\$0.0788	\$137.08	\$0.135

TABLE B3: BENCOST MODEL INPUTS

General Inputs	Specific Project Inputs
Retail Rate (\$/kWh)	Utility Project Costs (\$)
Non-Electric Fuel Retail Rate (\$/Fuel Unit)	Administrative Costs (\$)
Commodity Cost (\$/kWh)	Incentive Costs (\$)
Demand Cost (\$/kW/Yr)	Total Utility Project Costs (\$)
Peak Reduction Factor (%)	Direct Participant Project Costs (\$/Participant)
Variable O&M (\$/kWh)	Participant Non-Energy Costs (Annual \$/Part)
Non-Electric Fuel Cost (\$/Fuel Unit)	Participant Non-Energy Savings (Annual \$/Part)
Non-Electric Fuel Loss Factor	Project Life (Years)
Electric Environmental Damage Factor (\$/kWh)	Avg. kWh/Participant Saved
Participant Discount Rate (%)	Avg. Non-Electric Fuel Units/Part. Saved
Utility Discount Rate (%)	Avg. Additional Non-Electric Fuel Units/Part. Saved
Societal Discount Rate (%)	Number of Participants
General Input Data Year	Total Annual kWh Saved
Project Analysis Year	Incentive/Participant
Growth and Escalation Factors (%)	

¹⁴ Avoided cost inputs provided by Kentucky Power (AEP) Load Forecasting Group through a data request.

TABLE B4: BENECOST MODEL OUTPUTS

General Outputs	Benefit-Cost Test Outputs (Per Test)
Coincident Utility Peak Demand Reduction	Net Present Value of Benefits - Costs
Annual Utility Energy Reduction	Benefit-Cost Ratio
Total Utility Demand Reduction	Total Benefits
Total Utility Energy Reduction	Total Costs
Levelized Costs per kWh	
Levelized Costs per kW	
Annual Participant Savings	
Simple Payback	



**Kentucky Power Company
Residential and Small
Commercial HVAC Diagnostic
and Tune-Up Program
Process, Market and Impact Evaluation • July 2012**

Submitted by

Applied Energy Group, Inc
1377 Motor Parkway, Suite 401 • Islandia, NY 11749
Tel (631) 434-1414 • Fax (631) 434-1212
www.appliedenergygroup.com

Abstract

Kentucky Power Company retained Applied Energy Group to conduct a process, market and impact evaluation of its Residential and Small Commercial HVAC Diagnostic and Tune-Up Program. The HVAC Diagnostic and Tune-Up Program offers residential and small commercial (less than 100 kW) diagnostic performance check and tune-up services for their unitary air conditioning and heat pump systems. The services, performed by a participating KPCO HVAC dealer, include testing and correcting inefficiencies in unitary air conditioning and heat pump systems due to air-restricted indoor or outdoor coils and over or under refrigerant charges.

To arrive at the final recommendations of the evaluation, AEG reviewed program materials, assessed Kentucky Power's program tracking and conducted interviews with Kentucky Power program staff, participating customers and participating HVAC dealers. The results of the analysis, along with key findings and recommendations for program improvements, are included in this report.

Table of Contents

Abbreviations	i
Definitions	ii
Executive Summary	iv
1. Introduction.....	1
2. Program Description	1
3. Evaluation Methodology	3
4. Process and Market Evaluation Findings.....	6
4.1 Program Logic Model	6
4.1.1 Activities and Outputs	9
4.1.2 Outcomes	10
4.1.3 External Factors.....	11
4.1.4 Best Practices	11
4.2 Program Performance.....	12
4.3 Program Marketing	15
4.3.1 Program Awareness	16
4.3.2 Motivation for Participation.....	17
4.3.3 Customer Demographics.....	18
4.4 Program Tracking & Incentive Processing.....	19
4.5 Program Satisfaction	21
4.5.1 Participating Customer Satisfaction	21
4.5.2 Participating Dealer Satisfaction	23
5. Impact Evaluation Findings	25
5.1 Gross Energy and Demand Savings	25
5.2 Net Energy and Demand Savings	26
5.2.1 Free Ridership.....	27
5.2.2 Spillover.....	29
5.3 Program Site Inspections and Performance Verification	30
5.4 Program Cost-Effectiveness	30
6. Key Findings and Recommendations	33
6.1 Key Program Findings.....	33
6.1.1 Program Performance Indicators	33
6.1.2 Program Tracking	33
6.1.3 Program Awareness and Marketing Strategies.....	33
6.1.4 Best Practices	34
6.1.5 Verify Program Impacts.....	34
6.2 Recommendations	35
6.2.1 Hire Implementation Contractor.....	35
6.2.2 Consider Program Modifications.....	36
6.2.3 Engage Participating HVAC Dealers.....	36
Appendix A. Participating Dealer Survey Guide (a).....	38

Appendix B. Participating Dealer Survey Guide (b).....41
 Appendix C. Participating Residential Customer Survey Guide43
 Appendix D. Participating Small Commercial Customer Survey Guide.....46
 Appendix E. Cost-Effectiveness Analysis Inputs50

List of Tables

Table ES1 Program Participation, Goals Originally Filed and Actualv
 Table ES2 2011 Energy Savings by Equipment Type, Residentialvi
 Table ES3 2011 Energy Savings by Equipment Type, Small Commercialvi
 Table 1 Program Budget, 2010-20122
 Table 2 Detailed Program Budget, 2010-2012.....2
 Table 3 Program Participation Goals, 2010-20123
 Table 4 Anticipated Energy and Demand Savings per Participant3
 Table 5 Overview of IPMVP Options5
 Table 6 Program Participation, 2010-201112
 Table 7 Budget and Participation Goals by Sector as Originally Filed, 2010-2011.....14
 Table 8 Actual Expenditures and Participation by Sector, 2010-2011.....14
 Table 9 Most Active Participating HVAC Dealers15
 Table 10 Residential Participant Satisfaction with the Program, n=58.....22
 Table 11 Small Commercial Participant Satisfaction with the Program, n=19.....22
 Table 12 2010-2011 Gross Savings per Unit, Residential.....26
 Table 13 2010-2011 Gross Savings per Unit, Small Commercial.....26
 Table 14 2010-2011 Total Gross Demand and Energy Savings, Residential26
 Table 15 2010-2011 Total Gross Demand and Energy Savings, Small Commercial26
 Table 16 2010-2011 Net Demand and Energy Savings, Residential.....27
 Table 17 2010-2011 Net Demand and Energy Savings, Commercial27
 Table 18 Free Ridership Probability Scores, Questions 1 and 2.....28
 Table 19 Free Ridership Probability Scores, Questions 3 and 4.....28
 Table 20 Free Ridership Weighted Probability, Residential28
 Table 21 Free Ridership Weighted Probability, Small Commercial.....29
 Table 22 Spillover Probability Scores29
 Table 23 Spillover Weighted Probability, Residential29
 Table 24 Spillover Weighted Probability, Small Commercial30
 Table 25 Program Cost-Effectiveness Results, Residential31
 Table 26 Program Cost-Effectiveness Results, Small Commercial31
 Table 27 Measure Cost-Effectiveness Results, Residential31
 Table 28 Measure Cost-Effectiveness Results, Small Commercial.....31
 Table 29 Program Cost-Effectiveness Results if Contractor Incentive Reduced & CAC Removed,
 Residential32

Table 30 Program Cost-Effectiveness Results if Contractor Incentive Reduced & CAC Removed, Small Commercial32
 Table 31 Kentucky Power Portfolio Cost-Effectiveness Results, 2011.....32
 Table 32 Program Participation, Goals Originally Filed and Actual.....33
 Table 33 2011 Energy Savings by Equipment Type, Residential34
 Table 34 2011 Energy Savings by Equipment Type, Small Commercial35

List of Figures

Figure 1 Program Logic Model8
 Figure 2 Length of Time between Submitting Application and Receiving Rebate Check10
 Figure 3 HVAC Systems Rebated by System Type by Sector, 2010-2011.....12
 Figure 4 HVAC Systems Rebated Monthly by System Type by Sector, 2010-201113
 Figure 5 Newspaper Advertisement.....16
 Figure 6 How Customers First Learned of the Program.....17
 Figure 7 How Participating HVAC Dealers First Learned of the Program.....17
 Figure 8 Customer Motivation for Participation18
 Figure 9 Residential Participant Demographics, n=5819
 Figure 10 Small Commercial Participant Demographics, n=1519
 Figure 11 Reasons Participant Would Recommend their Contractor21
 Figure 12 Reasons Participant Would Recommend the Program.....22
 Figure 13 Participant Suggestions for Program Improvement.....23
 Figure 14 Likelihood of Non-Participating HVAC Dealer Submitting Rebate in 2012, n=824
 Figure 15 Participating HVAC Dealer Preferred Contact Medium, n=724
 Figure 16 Participating HVAC Dealer Satisfaction with the Program, n=7.....25

Abbreviations

AEG	Applied Energy Group, Inc.
AEP	American Electric Power
EM&V	Evaluation Measurement and Verification
DSM	Demand Side Management
HVAC	Heating Ventilation & Air Conditioning
IPMVP	International Performance Measurement and Verification Protocols
KPCO	Kentucky Power Company
NTG	Net-To-Gross Ratio
PSC	Public Service Commission
QA/QC	Quality Assurance/Quality Control
EFLH	Equivalent Full Load Hours
EER	Energy Efficiency Ratio
SEER	Seasonal Energy Efficiency Ratio

Definitions

Benefit-Cost Ratio: The ratio of total benefits of a program to the total costs discounted over some specified time period. The benefit-cost ratio gives a rough measure of the participant rate of return and provides an indicator of program risk. A ratio above one indicates a beneficial program.

Participant Cost Test: Measures the quantifiable benefits and costs to the customer due to participation in a program.

Program Administrator Cost Test: Measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs), excluding any net costs incurred by the participant. The benefits are similar to the Total Resource Cost benefits, but costs are more narrowly defined.

Ratepayer Impact Measure (RIM) Cost Test: Measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected are less than the total costs incurred by the utility. The RIM test indicates the direction and magnitude of the expected change in customer bills or rate levels.

Total Resource Cost (TRC) Test: Measures the net costs of a demand side management program as a resource option based on the total costs of the program, including both the participant and utility costs.

British thermal unit (Btu): The amount of heat needed to raise one pound of water at maximum density one degree Fahrenheit. Btu is used to describe the power of heating and cooling systems, such as furnaces, stoves, barbecue grills, and air conditioners. Air conditioners for household use typically produce between 5,000 and 15,000 Btu. 1 watt is approximately 3.41 Btu/h.

Coincidence Factor: The ratio, expressed as a numerical value or as a percentage, of the simultaneous maximum demand of a group of electrical appliances or consumers within a specified period to the sum of their individual maximum demands within the same period.

Cost-effectiveness: A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the lowest cost alternative for the achievement of a given target.

Demand Side Management (DSM): Programs designed to provide incentives to end-use customers or curtailment service providers to enhance the ability and opportunity for reduction of load during peak hours.

Energy Efficiency Ratio (EER): average efficiency of the equipment under peak conditions. A measure of the relative efficiency of a heating or cooling appliance, such as an air conditioner, that is equal to the unit's output in Btu's per hour divided by its consumption of energy, measured in watts.

Equivalent Full Load Hours (EFLH): The number of hours a system operates at full load during one year for cooling or heating purposes. Expressed as total annual energy use divided by total peak load.

Evaluation Measurement and Verification (EM&V): A set of analyses used to assess energy efficiency programs in terms of energy and demand savings and cost-effectiveness. There are several approaches to EM&V, some of which have been codified as best practices (see IPMVP). Most energy efficiency programs are subject to some type of EM&V.

GRIDSMA[®] Programs: An AEP energy efficiency initiative that includes over 100 energy efficiency programs across the AEP service territory. The programs feature smart grid technologies such as smart meters, voltage optimization equipment and smart appliances that can reduce energy use.

Gross Energy Savings: Energy and demand savings seen by the participant at the meter. These are the appropriate program impacts to calculate bill reductions for the Participant Test.

Impact Evaluation: A method of evaluation that assesses any changes, intended or unintended that are directly attributable to an energy efficiency program.

International Performance Measurement and Verification Protocols (IPMVP): Provides an overview of current best practice techniques available for verifying results of energy efficiency, water efficiency, and renewable energy projects in commercial and industrial facilities. It may also be used by facility operators to assess and improve facility performance. Energy conservation measures covered in the protocols include fuel saving measures, water efficiency measures, load shifting and energy reductions through installation or retrofit of equipment, and/or modification of operating procedures.

Kilowatt (kW): A unit of power that describes the rate at which energy is generated or used. It quantifies the electric power required by an appliance or device such as a light bulb.

Kilowatt Hour (kWh): A unit of energy that describes how much electricity is consumed over a period of time. For example, if you turn on a 100 watt light bulb all day for 24 hours the light bulb consumed 2.4 kWh of electricity.

Net Energy Savings: The energy and demand savings attributable to the program, adjusted for free riders and spillover.

Net-to-Gross (NTG) Ratio: The ratio of net energy savings to gross energy savings indicates the overall effectiveness of an energy efficiency program. As the NTG ratio approaches one, the magnitude of the program impact increases.

Free Riders: Customers who participate in energy efficiency programs who would have engaged in the efficient behavior in the absence of the program. As a result, the presence of free riders tends to overestimate the energy savings of the program.

Spillover: Customers who engage in energy efficient behavior, but do not participate in the program, due to some influence of the program.

Process Evaluation: A method of evaluation that uses empirical data to assess the delivery of energy efficiency programs, verify goals and determine whether the program is implemented as designed.

Program Logic Model: Graphic representation of an energy efficiency program and its processes. Logic models show the causal relationships or linkages among the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders critical to a program's performance.

Seasonal Energy Efficiency Ratio (SEER): average efficiency of the equipment during a typical cooling-season at the location of the measure. Ratio of the cooling output (Btu) divided by the power consumption (total electric energy input in watt-hours) during the same period. The higher the SEER, the more efficient the unit.

Executive Summary

Applied Energy Group, Inc ("AEG") was retained by Kentucky Power Company ("KPCO" or "Kentucky Power") to conduct a process, market and impact evaluation of its Residential and Small Commercial HVAC Diagnostic and Tune-Up Program. The HVAC Diagnostic and Tune-Up Program offers residential and small commercial (less than 100 kW) diagnostic performance check and tune-up services for their unitary air conditioning and heat pump systems. The services, performed by a participating KPCO HVAC dealer, include testing and correcting inefficiencies in unitary air conditioning and heat pump systems due to air-restricted indoor or outdoor coils and over or under refrigerant charges. Repairs reduce energy and demand use, improve customer comfort and extend the serviceable life of the unit.

AEG designed the process and market evaluation to examine program processes and customer responses to the program. The evaluation identifies methods for gathering data and measuring program results, and makes recommendations for program improvements. To arrive at the final recommendations, AEG performed the following tasks:

- Reviewed program materials and data.
- Reviewed program tracking methods.
- Updated program logic model and assessed program flow.
- Conducted interviews with KPCO staff.
- Conducted surveys of participating customers.
- Conducted surveys and site visits with participating HVAC dealers.

AEG designed the impact evaluation to assess the gross and net demand savings, gross and net energy savings, and the cost-effectiveness of installed measures. The evaluation verifies gross and net savings and measure installation. To verify program impacts AEG performed the following tasks:

- Calculated the gross energy (kWh) and peak (kW) impacts by project using engineering calculations.
- Performed cost-effectiveness analysis using a benefit-cost analysis model.

Summary of Key Findings

The stated goal of the HVAC Diagnostic and Tune-Up Program is to reduce energy use by conducting a diagnostic performance check on residential and small commercial unitary air conditioning and heat pump units, air restricted indoor and outdoor coils, and over and under refrigerant charge.

Program Performance Indicators

In 2010 and 2011, Kentucky Power rebated 1,143 residential and small commercial diagnostic and tune-ups through the HVAC Diagnostic and Tune-Up Program. Sixty-six (66) percent of the systems were residential heat pumps, 20 percent residential central air conditioners, 9 percent small commercial heat pumps and 4 percent small commercial central air conditioners. The program was approved in August 2010, two months later than anticipated in the Kentucky PSC filing, and implemented in September.

KCPO achieved 22 percent of the 130 participant goal in 2010 at an actual cost per participant lower than originally budgeted. The program exceeded the 700 participant goal in 2011 by approximately 60 percent. However, small commercial cost per participant was higher than originally budgeted.

Table ES1 Program Participation, Goals Originally Filed and Actual

	2010		2011	
	Goal	Actual	Goal	Actual
Residential CAC	60	0	325	232
Residential HP	40	28	215	730
Small Commercial CAC	26	0	136	46
Small Commercial HP	4	1	24	106
Total	130	29	700	1,114

In 2010 and 2011, 23 out of 101 participating HVAC dealers participated in the HVAC Diagnostic and Tune-Up Program or Small Commercial Heat Pump/Air Conditioner Incentive Program. The three most active HVAC dealers performed 69 percent of the diagnostic and tune-up services. HVAC dealers surveyed noted that the KPCO dealer incentives and being listed on the KPCO website as a participating dealer were significant motivators for participation.

Program Tracking

The program tracking and monitoring system accurately tracks program data and processes rebates. However, participating customers surveyed noted that incentive processing times could be improved.

Program Awareness and Marketing Strategies

The marketing strategy for the program included a combination of Kentucky Power program staff and participating HVAC dealers. KPCO staff promoted the programs directly to HVAC dealers and, in turn, the participating dealers were expected to promote the program to eligible customers.

According to survey respondents, customers most often learned of the program from a Kentucky Power employee, followed closely by the heating and cooling contractor. Participating HVAC dealer recommendations were the primary reason for customer participation. Eight-five (85) to 95 percent of participating customers surveyed noted that information from the participating HVAC dealer was a crucial factor in their decision to have HVAC diagnostic and tune-up services. Participating customers and HVAC dealers surveyed noted that the program would benefit from increased publicity and advertising.

Best Practices

Kentucky Power's program design and processes are largely consistent with best practices for similar energy efficiency programs. In 2011, HVAC tune-ups or controls upgrades were featured in 39 percent of residential energy efficiency programs and 48 percent of commercial programs.¹

¹ Consortium for Energy Efficiency. (2011) *State of the Efficiency Program Industry*. See www.cee1.org/files/2011%20CEE%20Annual%20Industry%20Report.pdf

The challenges posed by lack of information are ubiquitous in energy efficiency programs. Investment in education and outreach typically boost awareness and increase program participation. Actively engaging key stakeholders, such as HVAC contractors or home/business owners, is crucial to the success of any energy efficiency program.

Many energy efficiency programs suffer from lack of staff resources. Additional staff personnel may be necessary to ensure that program goals are met and that the program delivers the intended results. The increased program costs of additional staff are often recouped by improved performance.

Verify Program Impacts

AEG has determined the net-to-gross ratio for the HVAC Diagnostic and Tune-Up Program is 78 percent for small commercial customers and 77 percent for residential customers. Participating small commercial customer probabilities free ridership was estimated at 27 percent and spillover at 5 percent. Residential customer free ridership was estimated at 60 percent and spillover at 37 percent. Tables ES2 and ES3 present the net energy savings and cost-effectiveness ratios for residential and small commercial, respectively.

Program cost-effectiveness was greatly affected by the incentives paid to participating HVAC dealers. The inclusion of central air conditioner tune-ups also drive the cost-effectiveness of the program down. With the reduction of the participating HVAC dealer incentive to \$25 and the removal of the central air conditioner tune-ups, both the residential and commercial programs would be cost-effective and pass the TRC test. Note that very low avoided costs, especially the extremely low capacity costs in the Kentucky Power service territory, have a significant negative impact on the program's cost-effectiveness.

Table ES2 2011 Energy Savings by Equipment Type, Residential

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Heat Pump Tune Up	77%	27.34	113.99	341,260	0.88
Central Air Conditioner Tune Up	77%	8.97	0.00	29,100	0.19
Program Total		36.30	113.99	370,360	0.71

Table ES3 2011 Energy Savings by Equipment Type, Small Commercial

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Heat Pump Tune Up	78%	5.86	24.93	74,255	0.96
Central Air Conditioner Tune Up	78%	3.28	0.00	10,655	0.25
Program Total		9.15	24.93	84,910	0.75

AEG accompanied participating HVAC dealers during the performance of the diagnostics and tune-ups for air conditioners and heat pumps. Proper performance verification was confirmed at all locations.

Recommendations

AEG has several recommendations on how to improve the program. These include:

Hire Implementation Contractor

AEG recommends that Kentucky Power hire an implementation contractor to implement Kentucky Power's residential and small commercial HVAC programs, including, but not limited to, the Residential and Small Commercial HVAC Diagnostic and Tune-Up Program, the Small Commercial Heat Pump/Air Conditioner Incentive Program, the Residential High Efficiency Heat Pump Program, Mobile Home High Efficiency Heat Pump, and Mobile Home New Construction.

Kentucky Power has a small staff to run and oversee Kentucky Power's numerous energy efficiency programs. Some of the KPCO programs have implementation contractors that perform the day-to-day operations for the program, but the residential and small commercial HVAC programs are run completely by KPCO staff. Therefore, KPCO staff is responsible for marketing and promotional activities, including visiting participating and potential HVAC dealers across the KPCO territory, processing rebate applications, tracking rebate applications and performing QA/QC inspections. Due to the limited resources, Kentucky Power has not yet conducted an inspection to ensure services are being performed properly.

The residential and small commercial HVAC programs share many similar components, including marketing and promotional activities and data tracking systems as well as the same participating HVAC dealers. Utilizing one implementation contractor to implement the HVAC programs will allow the programs to continue capitalizing on their similarities and increase the efficiency of program processes.

The implementation contractor will have, at a minimum, the following responsibilities:

- Develop program goals and budget.
- Develop marketing and promotional activities.
- Design and maintain a data tracking system.
- Process customer and contractor rebate applications.
- Engage and monitor participating HVAC dealers.
- Develop QA/QC procedures and conduct random inspections of completed work.

Consider Program Modifications

AEG recommends that Kentucky Power and the implementation contractor consider modifying the HVAC Diagnostic and Tune-Up Programs:

- Reduce the participating HVAC dealer incentives to \$25 (from the current \$50 incentive).
- Remove central air conditioner tune-ups from the program offering.
- Reduce the customer incentive to \$30 (from the current \$50 incentive).

Program cost-effectiveness was negatively affected by the incentives paid to HVAC dealers and the inclusion of central air conditioner tune-ups. The residential and commercial programs are cost-effective if the participating HVAC dealer incentive is reduced and central air conditioner tune-ups removed. Note that these modifications may not be necessary if there are program budgetary changes or changes to Kentucky Power's avoided costs.

Residential HVAC Diagnostic and Tune-Up Program free ridership is estimated at 60 percent. The program was designed such that the participating HVAC dealers promote the program to eligible customers. Therefore, participating HVAC dealers are likely to initially provide the diagnostic and tune-up services to existing clientele that may typically receive these services without an incentive, and then begin to promote the program to new clientele. Therefore, free ridership is anticipated to decrease as HVAC dealers promote the program to new clientele.

AEG recommends additional modifications to reduce free ridership:

- Modify customer eligibility. Customers are currently eligible for a rebate every 3 years, this should be extended to every 5 years to correspond with the measure life of the services.
- Require the customer to submit the rebate application. Other than receiving the diagnostic and tune-up service, the customer does not have to take any action to receive the incentive.
- KPCO market directly to residential customers and encourage HVAC dealers to market to customers that do not consistently receive these tune-up services.

Engage Participating HVAC Dealers

AEG recommends that Kentucky Power and the implementation contractor engage actively participating HVAC dealers and remove non-participating HVAC dealers from the participating HVAC dealer list if they have not actively participated in a KPCO HVAC program within the most recent 12 months.

HVAC dealer participation is crucial to the program; 92 percent of survey respondents noted that information from the contractor was a crucial factor in their decision to purchase and install efficient HVAC equipment. There are currently 101 HVAC dealers participating in the HVAC Diagnostic programs. In 2010 and 2011, only 23 dealers participated in the HVAC Diagnostic and Tune-Up Program or the Small Commercial Heat Pump/Air Conditioner Incentive Program.

AEG recommends collaboration between Kentucky Power and the implementation contractor to engage contractors and explore modifying the marketing and promotional activities. Kentucky Power and the implementation contractor should explore cooperative marketing with the participating contractors to potentially leverage contractor's marketing experience. Cooperative marketing would be offered on a temporary basis and the impact on participation reviewed before permanent changes were made to the program.

1. Introduction

Applied Energy Group, Inc. ("AEG") was retained by Kentucky Power Company ("Kentucky Power" or "KPCO") to conduct a comprehensive evaluation of its 2010-2012 Demand Side Management ("DSM") Program Portfolio.² The 2010-2012 DSM Program Portfolio includes the Residential Efficient Products Program, Residential and Small Commercial HVAC Diagnostic and Tune-up Program, Commercial Incentive Program, Small Commercial High Efficiency Heat Pump and Air Conditioner Program, and the Residential and Small Commercial Load Management Pilot Program. The DSM programs will be evaluated concurrently and individual program Evaluation, Measurement and Verification ("EM&V") reports will be filed with the Kentucky Public Service Commission ("PSC") by the August 15, 2012 regulatory filing deadline.

Kentucky Power is an electric utility that serves approximately 175,000 customers in all or part of 20 eastern Kentucky counties.³ The utility is part of the American Electric Power ("AEP") system, which is one of the largest electric utilities in the United States.⁴ The 2010-2012 DSM Program Portfolio was implemented to help Kentucky Power and AEP reduce electricity use and peak demand, help customers lower their electricity bills, and encourage long-term change in the market through the adoption of energy efficiency technologies and services.

The Residential and Small Commercial HVAC Diagnostic and Tune-Up Program offers residential and small commercial (less than 100 kW) diagnostic performance check and tune-up services for their unitary air conditioning and heat pump systems. HVAC systems with coil and refrigerant inefficiencies are marginally operational and experience long run times. Repairs reduce energy and demand use, improve customer comfort and extend the serviceable life of the unit.

This report describes the key findings from the process, market and impact evaluation and provides recommendations for improving program performance and operations. Section 2 provides a program description and Section 3 described the process, market and impact evaluation methodology. Sections 4 and 5 present the process, market and impact evaluation findings. Key findings and recommendations are described in Section 6.

2. Program Description

The HVAC Diagnostic and Tune-Up Program offers residential and small commercial (less than 100 kW) diagnostic performance check and tune-up services for their unitary air conditioning and heat pump systems. The services, performed by a participating HVAC dealer, include testing and correcting inefficiencies in unitary air conditioning and heat pump systems due to air-restricted indoor or outdoor coils and over or under refrigerant charges. HVAC systems with coil and refrigerant inefficiencies are

² Kentucky Power's 2010-2012 DSM programs were approved in Case No. 2010-00095 and Case No. 2010-00198.

³ Kentucky Power. Facts, Figures & Bios. Accessed at www.kentuckypower.com/info/facts/

⁴ American Electric Power delivers electricity to more than 5 million customers in 11 states and ranks among the nation's largest generators of electricity, with almost 38,000 megawatts of generating capacity in the U.S.

marginally operational and experience long run times. Repairs reduce energy and demand use, improve customer comfort and extend the serviceable life of the unit.

Residential and small commercial customers are eligible for a \$50 and \$75 incentive, respectively, for receiving services from a participating dealer. KPCO participating HVAC dealers must be state-licensed contractors. Dealers are eligible for a \$50 incentive for each service performed (dealer will only receive incentive if customer rebate application is approved). Customers are limited to one rebate every three years for each eligible unit.

The diagnostic and tune-up services ensure customer HVAC systems:

- Are running at peak efficiency to help reduce operating costs.
- Contain the correct amount of refrigerant.
- Maintain efficient operation of indoor and outdoor coils.
- Receive periodic inspection to minimize unexpected equipment repairs.

The stated goal of the HVAC Diagnostic and Tune-Up Program is to reduce energy use by conducting a diagnostic performance check on residential and small commercial unitary air conditioning and heat pump units, air restricted indoor and outdoor coils, and over and under refrigerant charge.

The Kentucky Public Service Commission ("PSC") approved a three-year budget and participation goals for the HVAC Diagnostic and Tune-Up Program. Tables 1 through 3 present the originally filed program budgets and participations goals for 2010 through 2012 by sector and system type. The 2011 participating goal was revised from the original filing to 680. The 2012 program budget and participation goal were revised from the original filing to \$158,640 and 1,170,, respectively.⁵ Table 4 shows the anticipated energy and demand savings per participant by sector and system type as originally filed.

Table 1 Program Budget, 2010-2012

	2010	2011	2012
Residential	\$16,700	\$63,780	\$89,400
Small Commercial	\$6,960	\$24,120	\$32,600
Total	\$23,660	\$87,900	\$122,000

Table 2 Detailed Program Budget, 2010-2012

	2010	2011	2012
Equipment/Vendor	\$6,500	\$35,000	\$45,000
Customer Incentive	\$7,250	\$39,000	\$50,000
Promotion	\$9,000	\$9,000	\$9,000
Program Development & Admin	\$910	\$4,900	\$6,300
Evaluation	\$0	\$0	\$11,700
Total	\$23,660	\$87,900	\$122,000

⁵ See Case No. 2010-00095, Case No. 2011-00300, Case No. 2012-00051.

Table 3 Program Participation Goals, 2010-2012

	2010	2011	2012
Residential CAC	60	325	420
Residential HP	40	215	280
Small Commercial CAC	26	136	170
Small Commercial HP	4	24	30
Total	130	700	900

Table 4 Anticipated Energy and Demand Savings per Participant

	Summer kW	Winter kW	kWh
Residential CAC	0.169	-	311
Residential HP	0.169	0.219	741
Small Commercial CAC	0.357	-	687
Small Commercial HP	0.357	0.507	1,638

3. Evaluation Methodology

AEG designed the process, market and impact evaluation to determine the efficacy of program procedures and systems, evaluate the achievement of program objectives, provide insight into and recommendations for program improvement and verify the direct impacts of program activities.

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and quality assurance/quality control ("QA/QC") procedures are performing as designed. The evaluation also identifies issues or opportunities to improve these key elements. The goals of the process and market evaluation are to:

- Examine key performance indicators to identify participation or program issues;
- Conduct a comprehensive review of program tracking;
- Determine awareness levels as a way to refine marketing strategies and reduce barriers to program participation;
- Assist program implementers and managers to structure programs and achieve cost-effective savings while maintaining high levels of customer satisfaction;
- Provide recommendations for changing the program's structure, management, administration, design, delivery, operations or goals; and
- Determine if specific best practices should be incorporated.

Impact evaluations verify the energy and demand savings directly associated with a program and assess the cost-effectiveness of the DSM program. The goals of the impact evaluation are to:

- Verify the annual energy and coincident peak capacity savings and total resource benefit claims made by Kentucky Power; and
- Provide verification and documentation of DSM program impacts.

To arrive at the final recommendations, AEG carried out the following research activities.

Review Program Materials

AEG reviewed current program materials, documents and processes, including the rebate applications and marketing and outreach materials. The review served as the basis for understanding whether the program has been implemented as planned. The review was particularly important for preparing the interview guides and survey instruments for other process evaluation tasks.

Program Logic Model

AEG developed a program logic model based on a review of program materials and discussions with Kentucky Power program staff. The model shows the linkages between the program components, including activities, outputs, outcomes and key stakeholders. The model also highlights potential external influences and program inputs.

Program Tracking and Database Review

AEG reviewed current Kentucky Power rebate application review and processing, program tracking and reporting, and tracking databases.

Kentucky Power Staff Interview

AEG conducted a comprehensive, group interview with Kentucky Power program staff in November 2011. The purpose of this interview was to get staff impressions of program implementation activities, program performance, marketing and customer awareness of the program, program data and tracking mechanisms, and opportunities for program improvements. Individual interviews with program staff, as well as informal discussions around program performance, were also conducted between December 2011 and March 2012. Individual interviews focused on program design and delivery issues, program performance, potential areas of improvements, and overall program effectiveness.

Participating Dealer Interview

AEG administered a 10 to 12 minute telephone survey to a sample of participating HVAC dealers to assess customer satisfaction, potential areas for improvement, customer awareness and attitudes regarding energy efficiency and conservation, marketing and coordination efforts, and application processes as well as ascertain the clarity of program rules and usefulness of support materials from Kentucky Power. The participating HVAC dealer survey guides can be found in Appendices A and B.

Currently, 101 HVAC dealers participated in the HVAC Diagnostic and Tune-Up Program and Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. Twenty-one (21) HVAC dealers submitted a rebate for one or both of the programs. AEG conducted 17 surveys of participating HVAC dealers, 9 with dealers that submitted a rebate in 2011 and 8 with dealers that did not submit a rebate in 2011. Additionally, AEG accompanied two participating HVAC dealers to eight HVAC diagnostic and tune-up appointments to assess services rendered.

Participating Customer Surveys

AEG administered a 10 to 12 minute telephone survey to a sample of program participants to assess program experience and awareness, customer satisfaction, barriers to participation, free ridership and

areas for potential program improvement. The participating customer survey guides can be found in Appendix C (residential) and D (small commercial).

Kentucky Power provided data for 1,096 program participants who received rebates from November 2010 through December, 2011. The sample included 71 unique small commercial and 866 unique residential electric accounts, which were identified by the participant's account number and address. AEG calculated the sample size at a 90 percent confidence interval with an error margin of +/-10 percent. Participants were then randomly selected based on unique identifiers determined by Microsoft Excel's random number generator. Fifty-eight (58) residential and 19 small commercial surveys were completed.

Review Engineering or Deemed Savings Assumptions

AEG reviewed the engineering and/or deemed savings assumptions utilized by AEP to calculate program energy and demand impacts. Kentucky Power's initial program filing deemed savings assumptions were reviewed to ensure consistency with the impact evaluation results.

Gross Energy and Demand Impacts

AEG determined the gross energy and demand savings of a representative sample based on Option A of the international Performance Measurement and Verification Protocols ("IPMVP")⁶ outlined in Table 5.

Table 5 Overview of IPMVP Options

IPMVP M&V Option	Measure Performance Characteristics	Data Requirements
Option A: Engineering calculations using spot or short-term measurements, and/or historical data	Constant performance	<ul style="list-style-type: none"> • Verified installation • Nameplate or stipulated performance parameters • Spot measurements • Run-time hour measurements
Option B: Engineering calculations using metered data.	Constant or variable performance	<ul style="list-style-type: none"> • Verified installation • Nameplate or stipulated performance parameters • End-use metered data
Option C: Analysis of utility meter (or sub-meter) data using techniques from simple comparison to multivariate regression analysis.	Variable performance	<ul style="list-style-type: none"> • Verified installation • Utility metered or end-use metered data • Engineering estimate of savings input to SAE model
Option D: Calibrated energy simulation/modeling; calibrated with hourly or monthly utility billing data and/or end-use metering	Variable performance	<ul style="list-style-type: none"> • Verified installation • Spot measurements, run-time hour monitoring, and/or end-use metering to prepare inputs to models • Utility billing records, end-use metering, or other indices to calibrate models

Engineering calculations referenced from the *New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs* and *Illinois Technical Reference Manual*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts for HVAC tune-ups for small commercial and residential customers.

⁶ IPMVP provides best practice techniques for verifying results of energy efficiency projects, i.e. verifying savings attributed to energy efficiency projects.

Net Energy and Demand Impacts

AEG adjusted the gross energy and demand savings to reflect estimates of free ridership and spillover. Free ridership and spillover were determined from the participating customer interviews; see Section 5 for a detailed explanation.

Cost-Effectiveness Analysis

AEG analyzed the cost-effectiveness of the HVAC Diagnostic and Tune-Up Program utilizing Bencost, an updated version of a public domain model that AEG customized for Kentucky Power. Bencost is an input-output model that calculates four standard California cost-effectiveness tests, the Total Resource Cost, Participant Test, Utility Test and Rate Impact Measure Test. The analysis was conducted using Kentucky Power specific inputs, including avoided costs, discount rates, participation and incentives. Cost-effectiveness inputs and outputs are detailed in Appendix E.

4. Process and Market Evaluation Findings

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and quality assurance/quality control ("QA/QC") procedures are performing as designed. When potential deficiencies in these areas arise, the process and market evaluation identifies opportunities for improving these key elements.

4.1 Program Logic Model

Program logic models are graphic representations of an energy efficiency program and its processes. Logic models show the causal relationships or linkages between the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders that are critical to a program's performance.⁷

Key elements of a program logic model include:

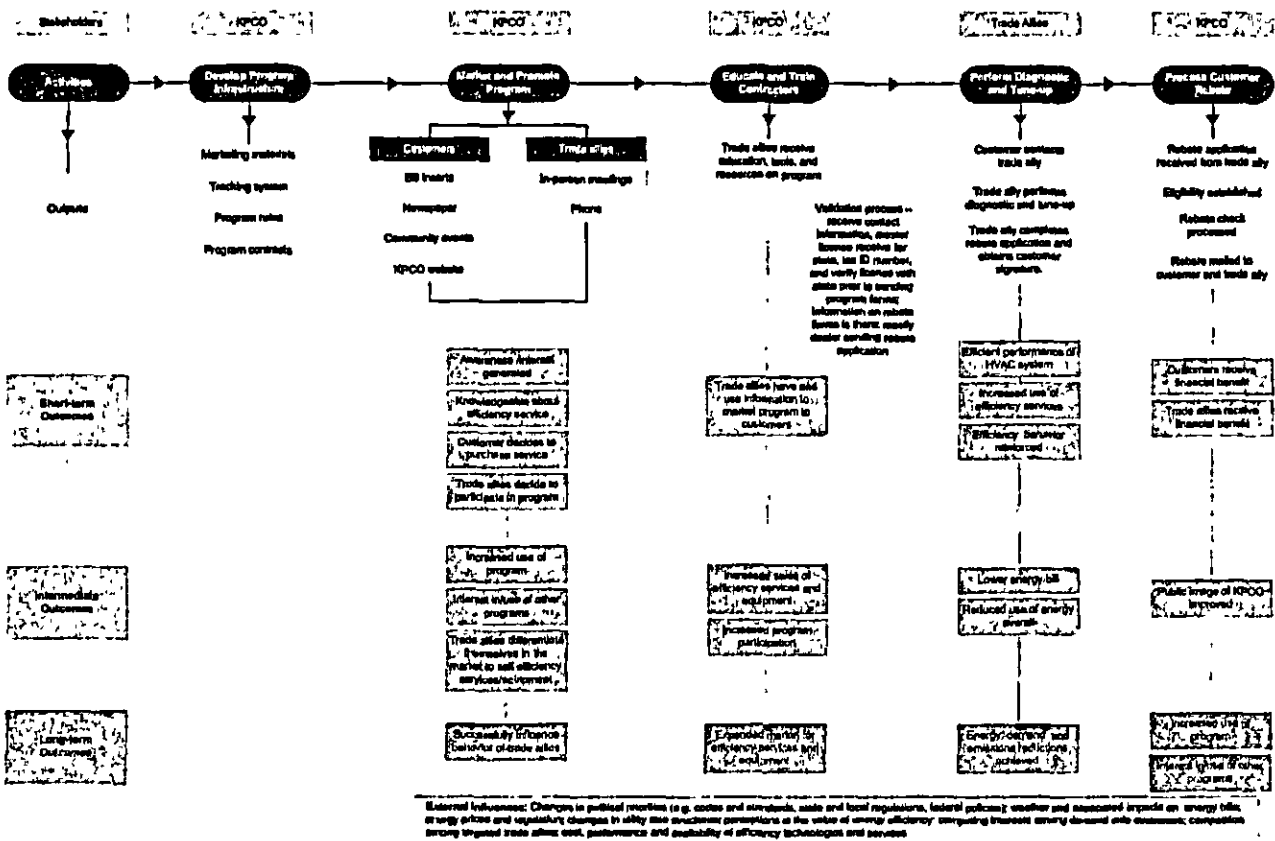
- **Inputs.** Resources that program stakeholders contribute to a program, such as knowledge, skills, expertise, finances or equipment.
- **Outputs.** Program activities and number of people reached, based on program goals.
- **Outcomes.** Short-term, intermediate or long-term results of the program outputs. Assists evaluators and program administrators in establishing program results.
- **External Influences.** Factors outside the utility's control that may influence the program outcomes. They help to identify important program partnerships as well as the issue(s) the program can realistically influence. The factors help determine which evaluation measures will accurately reflect project outcomes or any other goals that must be met to address the problem or situation.

⁷ McCawley, P. (2001). *The Logic Model for Program Planning and Evaluation*. Moscow: University of Idaho Extension.

In the logic model presented in Figure 1, program activities are oriented sequentially across the top of the page from the left to the right. The sequence of program activities is important. For example, the program's infrastructure, including its advertising materials, tracking systems, program rules, and contracts must be developed before the program can be marketed and customers recruited. The performance outputs and outcomes are oriented vertically from top to bottom. The box on the bottom right contains the external factors outside the utility's control that may affect program performance.

Figure 1 Program Logic Model

Inputs: program funding, PSC goals and reporting requirements, Kentucky Power program staff implementation expertise
 Resources and expertise, evaluation consultant resources and expertise, existing awareness of Kentucky Power



4.1.1 Activities and Outputs

There are five main activities in the HVAC Diagnostic and Tune-Up Program. The program activities and their corresponding outputs help to establish linkages between the situation the program is designed to address and the program's intended outcomes. Therefore, activities and outputs are discussed together.

Develop Program Infrastructure

Activities included gathering market knowledge, setting program goals, designing the program, establishing program rules, developing marketing approaches and content, and establishing institutional and operating structures. Kentucky Power staff, with input from AEP, designed the program, including rebate applications, data tracking system and marketing materials.

Market and Promote Program

The marketing strategy for the program included a combination of Kentucky Power program staff and participating HVAC dealers. Kentucky Power staff promoted the programs directly to HVAC dealers, mailing program fact sheets as well as calling and meeting in-person with dealers to discuss the programs. Additional marketing activities included direct mail, fact sheets, bill inserts, newspaper advertisements and community events. Participating HVAC dealers were encouraged, and expected, to promote the program to eligible customers.

Educate and Train Contractors

Kentucky Power program staff developed relationships and maintained direct contact with participating HVAC dealers. Kentucky Power program staff educated dealers on the HVAC Diagnostic and Tune-Up Program, including the eligible customers, qualifying services, rebate forms and rebate processing. Program staff also provided guidance on KCPO tools and resources, such as program paperwork, KCPO website, as well as how to use energy efficiency as a sales tool. Kentucky Power maintains a list of participating dealers on the DSM Program website.

Perform Diagnostic and Tune-Up Services

The customer may have learned of the program directly from the participating dealer or from some other source, such as KPCO marketing or word of mouth. Kentucky Power maintained a list of participating dealers on the DSM Program website. The participating dealers performed the HVAC diagnostic and tune-up services, including testing and correcting inefficiencies in unitary air conditioning and heat pump systems due to air-restricted indoor or outdoor coils and over or under refrigerant charges.

After the services have been completed, the customer received the rebate application from the HVAC dealer. The dealer completed and faxed the paperwork to the KPCO program staff.

Eight out of nine participating HVAC dealers surveyed completed and submitted the rebate application for the customer. One HVAC dealer had the customer submit the rebate application.

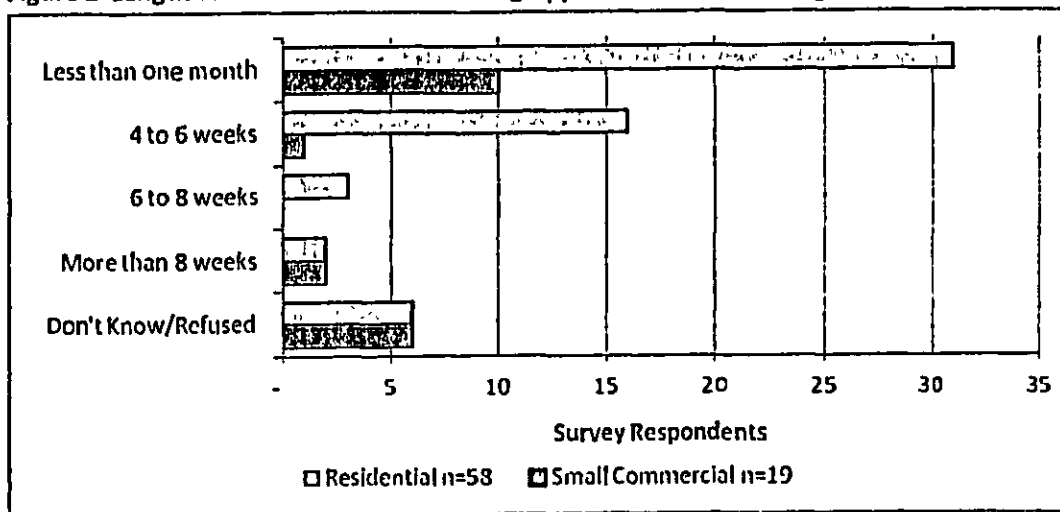
Process Customer Rebate

Customer rebates were processed by the Kentucky Power program staff. Staff reviewed the rebate applications to ensure the application is completed and the customer/dealer is eligible for an incentive. The application data was entered into the program tracking system and a payment request submitted for review and final approval. Once approved, the customer/dealer data was submitted to AEP's Accounting Group and a rebate check issued and mailed. According to Kentucky Power program staff,

It generally took one to two weeks for the customer to receive the rebate check, once the application was received by Kentucky Power.

As shown in Figure 2, participating customers surveyed noted that it often took less than one month to receive the rebate check from the time the application was submitted.

Figure 2 Length of Time between Submitting Application and Receiving Rebate Check



Kentucky Power maintained the right to conduct inspections on a sample of equipment that received diagnostic and tune-up services to ensure services are being performed properly and therefore the energy savings are being achieved. To-date no inspections have been conducted.

4.1.2 Outcomes

Outcomes are distinct from program outputs. When program partners or target audiences encounter program outputs, their reactions are referred to as program outcomes. The outcomes are divided into short-term, intermediate, and long-term outcomes are explained below.

Short-term Outcomes

When the program is marketed and promoted through events and literature, customers and HVAC dealers may become more aware of and interested in efficient lighting. Customers may also become knowledgeable about the efficiency services and costs associated with HVAC maintenance issues. Other short-term outcomes include the HVAC dealers having information to market the program to customers, increased maintenance of HVAC systems, and the financial benefit the customer and HVAC

dealer receives by participating in the program. The program may lead to an increased commitment to energy efficiency.

Intermediate Outcomes

Intermediate outcomes may include increased use of the program, interest in, and use of, other KPCO efficiency programs, increased sales of HVAC maintenance services and reduced energy consumption.

Long-term Outcomes

The long-term outcomes may include energy and demand savings, influence behavior of HVAC dealers, reduced utility emissions, fewer greenhouse gases emitted and an expanded market for HVAC maintenance services. Kentucky Power may enhance its public image as a utility that responds to customer needs without sacrificing consideration of environmental issues.

4.1.3 External Factors

Documenting external factors outside the control of Kentucky Power and its stakeholders improves program planning and evaluation by identifying important program partners, the activities the program can realistically influence, which evaluation measures will accurately reflect project outcomes, and other needs that must be met.

- Changes in political priorities (e.g. codes and standards, state and local regulations, federal policies, perceptions of energy and climate change);
- Weather and associated impacts on customer actions and energy bills;
- Energy prices and regulation;
- Changes in utility rate structures;
- Perceptions in the value of energy efficiency;
- Competing interests among demand side customers;
- Competition among targeted HVAC dealers;
- HVAC dealer business practices and interest in energy efficient technology; and
- Cost, performance and availability of efficient technologies and services.

4.1.4 Best Practices

Program administrators encounter common challenges that hinder energy efficiency programs from achieving maximum benefits, including, but not limited to:

- Lack of information and awareness of energy efficiency benefits.
- Limited resources / High initial costs energy efficient technologies.
- Competing priorities among customers and program administrators.
- Lack of clear, well-communicated program goals that correspond to overall organizational goals.

Best practices can provide ideas and/or tools to overcome these and other program barriers. Some key best practices include, but are not limited to, the following:

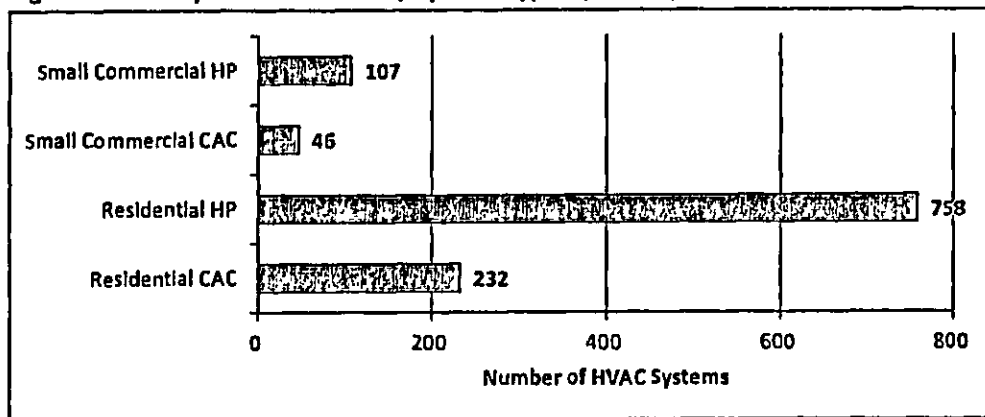
- Coordinate with other energy efficiency program administrators to overcome market barriers.
- Increase awareness by investing in education, outreach and marketing activities.

- Solicit stakeholder input and feedback to optimize program design and delivery.
- Develop reliable program tracking systems to support evaluation and implementation.

4.2 Program Performance

In 2010 and 2011, 1,143 customer HVAC systems were rebated under HVAC Diagnostic and Tune-Up Program. Sixty-six (66) percent of the systems were residential heat pumps, 20 percent residential central air conditioners, 9 percent small commercial heat pumps and 4 percent small commercial central air conditioners (see Figure 3).

Figure 3 HVAC Systems Rebated by System Type by Sector, 2010-2011



The HVAC Diagnostic and Tune-Up Program was expected to be approved by the Kentucky PSC in June 2010.⁸ However, the program was approved in August 2010 and implemented by Kentucky Power program staff in September. The first rebates were issued in November 2010.

Kentucky Power rebated 29 residential and small commercial diagnostic and tune-up services in 2010, achieving 22 percent of the 130 participant goal. This was likely due to the fact that the program was approved by the Kentucky PSC in August 2010 but the participation goals were based on an approval date of February 2010. There were 1,114 participants in 2011, exceeding the 700 participant goal by approximately 60 percent.

Table 6 Program Participation, 2010-2011

	2010	2011	Total
Residential CAC	0	232	232
Residential HP	28	730	758
Small Commercial CAC	0	46	46
Small Commercial HP	1	106	107
Total	29	1,114	1,143

Energy efficiency programs that offer services for cooling measures typically experience increased participation during the summer months. When the outside temperature is hottest, cooling equipment is used on a consistent basis. During the summer, customers that use space cooling equipment may find

⁸ See Case No. 2010-00095.

the program essential. Therefore, a customer is more likely to receive diagnostic and tune-up services for their central air conditioner during the spring and summer months. The number of central air conditioners that received services was typical of a program that offers incentives for improving the efficiency of cooling equipment, with participation spiking in the warmer months and falling during the colder months. Central air conditioner tune-ups were highest in the summer months (July through September).

Heat pumps provide cooling and heating to customers. Routine diagnostic and tune-up services typically occur year round, but generally follow a seasonal pattern. Customers primarily request diagnostic and tune-up services during the spring and fall seasons in preparation for the summer and winter seasons. Participation in the HVAC program reflects this seasonal pattern. Heat pump tune-ups spiked in the spring (March and April) and again in the fall (October to November).

Figure 4 presents the number of systems rebated by system type and sector. If the summer or winter months are mild, as compared to the historic temperature, customers will not be as likely to utilize their cooling and heating equipment and customer participation would decrease.

Figure 4 HVAC Systems Rebated Monthly by System Type by Sector, 2010-2011

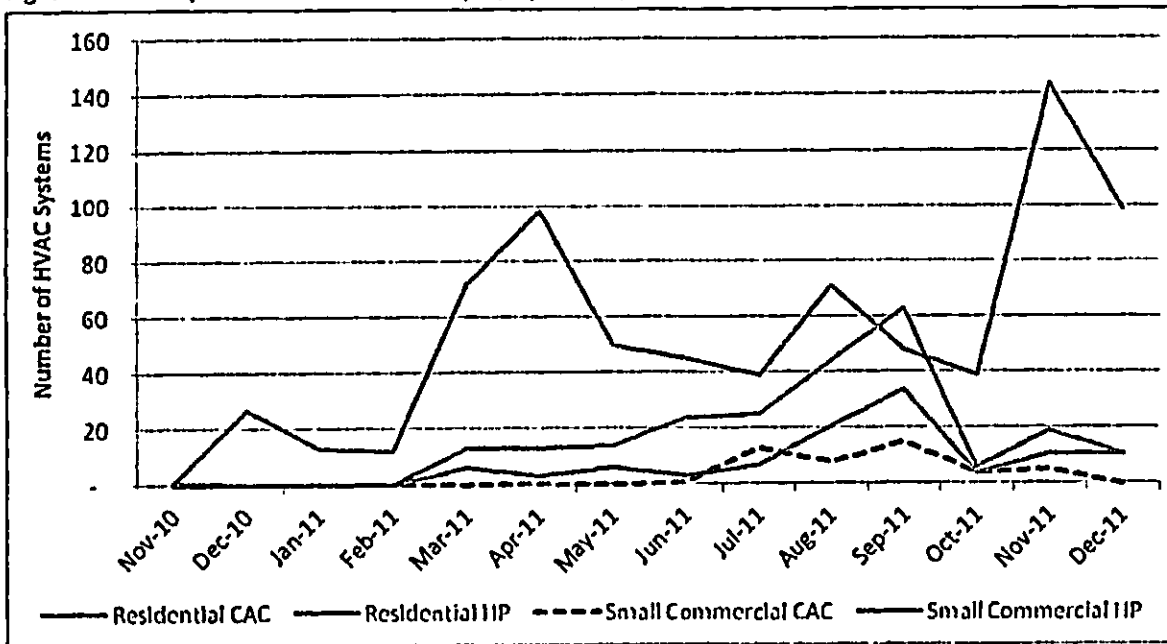


Table 7 presents the overall budget and budgeted cost per participant by sector and Table 8 presents the actual expenditures and actual cost per participant by sector. Actual 2010 expenditures and cost per participant were lower than originally budgeted, but the 2011 expenditures exceeded the original budget. The actual 2011 residential expenditures were \$100,224 compared to the original approved budget of \$63,780 and actual 2011 small commercial expenditures were \$27,093 compared to the original approved budget of \$24,120. However, the 2011 residential cost per participant was lower than budgeted while the small commercial cost per participant was higher than budgeted.

Table 7 Budget and Participation Goals by Sector as Originally Filed, 2010-2011

	Residential		Small Commercial	
	2010	2011	2010	2011
Equipment/Vendor	\$5,000	\$27,000	\$1,500	\$8,000
Customer Incentive	\$5,000	\$27,000	\$2,250	\$12,000
Promotion	\$6,000	\$6,000	\$3,000	\$3,000
Program Development & Admin	\$700	\$3,780	\$210	\$1,120
Evaluation	\$0	\$0	\$0	\$0
Total Budget	\$16,700	\$63,780	\$6,960	\$24,120
Participation Goal	100	540	30	160
Budgeted Cost (\$) per Participant	\$167	\$118	\$232	\$151

Table 8 Actual Expenditures and Participation by Sector, 2010-2011

	Residential		Small Commercial	
	2010	2011	2010	2011
Equipment/Vendor	\$1,450	\$45,350	\$50	\$7,300
Customer Incentive	\$1,400	\$45,300	\$75	\$10,875
Promotion	\$0	\$4,818	\$0	\$4,818
Program Development & Admin	\$0	\$0	\$0	\$0
Evaluation	\$0	\$4,756	\$0	\$4,100
Total	\$2,850	\$100,224	\$125	\$27,093

There were 101 HVAC dealers participating in the HVAC Diagnostic and Tune-Up Program and Small Commercial Heat Pump/Air Conditioner Incentive Program. In 2010 and 2011, 23 out of 101 participating HVAC dealers participated in at least one of the programs.⁹ Table 9 shows that 20 dealers received a rebate for diagnostic and tune-up services on 1,142 HVAC systems (one of the HVAC systems did not list the HVAC dealer that performed the work). The three most active HVAC dealers performed 69 percent of the diagnostic and tune-up services.

⁹ The 101 participating HVAC dealers may also participate in the Residential Heat Pump/Air Conditioner Program. However, the Residential Heat Pump/Air Conditioner Program was not evaluated and these results pertain only to the HVAC Diagnostic and Tune-up Program and Small Commercial Heat Pump/Air Conditioner Program.

Table 9 Most Active Participating HVAC Dealers

Contractor	HVAC Systems Rebated	% of Total
Appalachian Refrigeration	445	39.0%
Bobby Howard & Sons	209	18.3%
Breeding's Plumbing & Electric	135	11.8%
Aire Serv	105	9.2%
Big Sandy Heating & Cooling	95	8.3%
C&H Heating & Air Conditioning	56	4.9%
Ashland Furnace	30	2.6%
Breathitt Mechanical	15	1.3%
HELP Air Conditioning & Heating	13	1.1%
Cadco Heating & Air Conditioning	11	1.0%
Webb's Heating & Cooling	9	0.8%
Burchett's Heating & Cooling	6	0.5%
General Heating & Air Conditioning	5	0.4%
American Heating & Cooling	2	0.2%
Cox Commercial	1	0.1%
Elliot Supply & Glass, Inc	1	0.1%
Delta Supply Heating & Cooling	1	0.1%
Kentucky Wide Heating & Cooling	1	0.1%
Patterson Repair Service	1	0.1%
Scurlock Heating & Cooling	1	0.1%
Total	1,142	100%

4.3 Program Marketing

Kentucky Power marketed the HVAC Diagnostic and Tune-Up Program as part of a broader initiative under Kentucky Power's GRID SMART® Programs. Kentucky Power marketed the program to residential and small commercial customers as well as HVAC dealers within the KPCO service territory. Customers could search for participating HVAC dealers by geographic location on the KPCO SMART Programs website.

The participating dealers and potential participant pool were the same for both the Small Commercial HVAC Diagnostic and Tune-Up Program and the Small Commercial Heat Pump/Air Conditioner Incentive Program; therefore, these programs were marketed together.

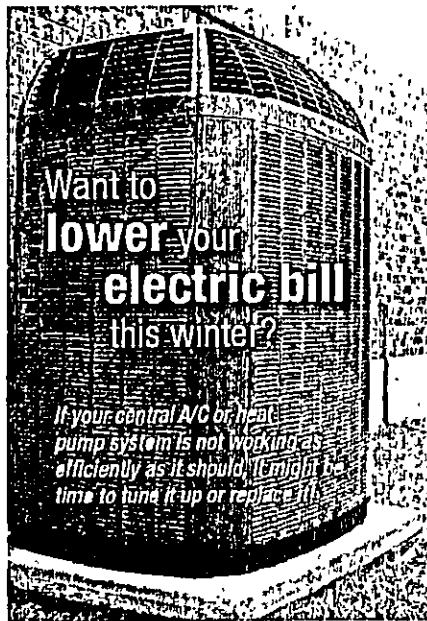
In 2010 and 2011, Kentucky Power marketed the program through the following program outputs:

- **HVAC Dealer Outreach.** Kentucky Power staff promoted the programs directly to HVAC dealers. Outreach included mailing program fact sheets and telephoning or personally meeting with prospective dealers to discuss the programs.
- **Bill Inserts** were included in residential and small commercial customer bills in July and November 2011.
- **Newspaper Advertisements** were run in fifty media outlets during the fall and summer of 2011.
- **Community Events.** KPCO staff members attended community events in multiple counties, promoting the DSM Programs and distributing program fact sheets and CFLs. Overall, these events were attended by 400 to 450 residential customers per event.

- **Internet.** Kentucky Power marketed the program online through the KPCO SMART Programs website at kentuckypower.com/save
- **KPCO Employee Communications.** Posters and email blasts were utilized to help KPCO employees become more familiar with the DSM Programs. KPCO employees were encouraged to promote programs in the local community.

Participating HVAC dealers increased by approximately 10 percent after the newspaper advertisements were run due to customer interest in the program.

Figure 5 Newspaper Advertisement



Kentucky Power is offering our residential customers \$50 for use toward an A/C or heat pump tune-up.

Eligible small commercial customers can get a \$75 incentive for an A/C or heat pump tune-up. Customers can also receive an incentive of \$250 - \$450 for upgrading to a new, qualifying energy efficient unit.

4.3.1 Program Awareness

According to survey respondents, customers most often learned of the program from a Kentucky Power employee, followed closely by the heating and cooling contractor. Participating HVAC dealers often learned about the program through a Kentucky Power employee. Participating dealers that did not receive a rebate in 2011 noted other means, such as word of mouth, email and KentuckyPower.com.

Figure 6 How Customers First Learned of the Program

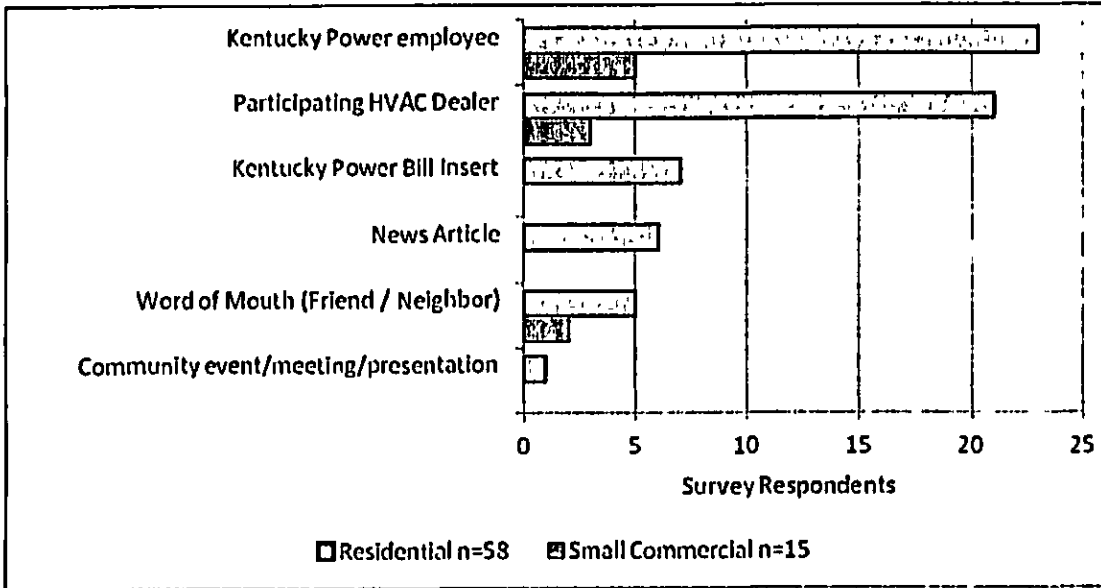
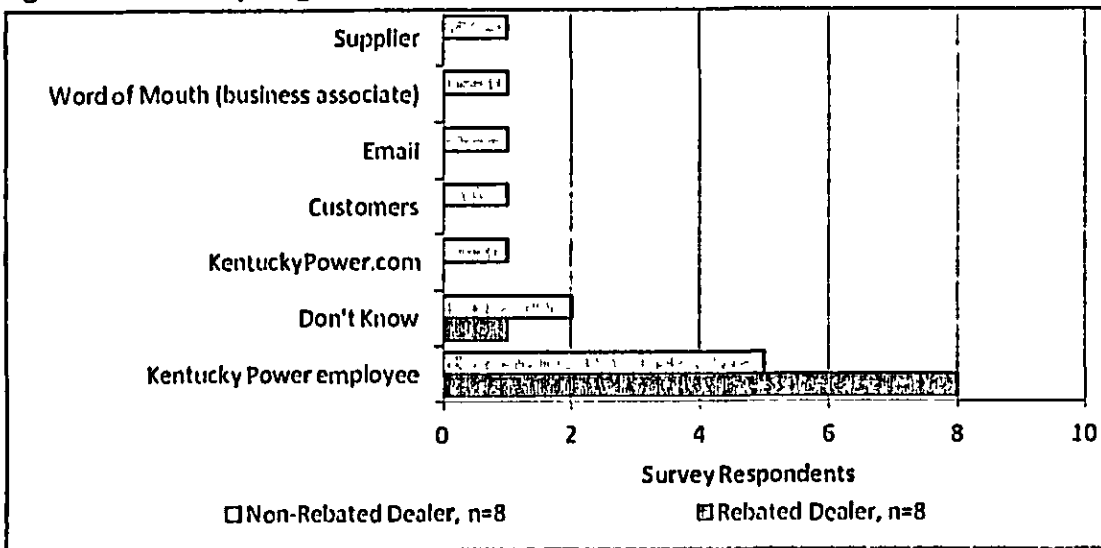


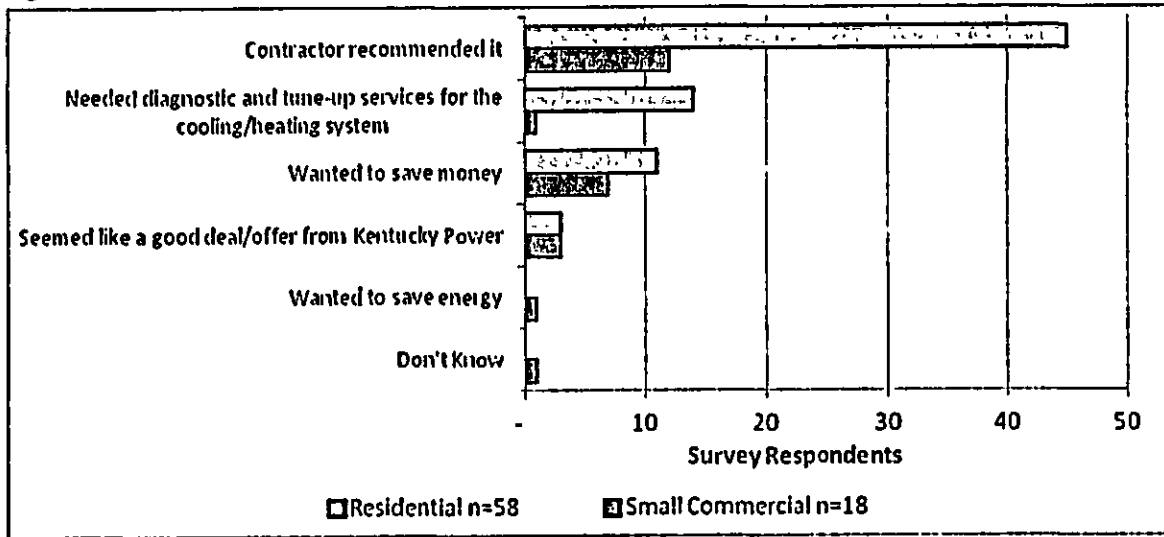
Figure 7 How Participating HVAC Dealers First Learned of the Program



4.3.2 Motivation for Participation

Seventy-eight (78) percent of residential and 67 percent of small commercial participating customers surveyed cited the contractor's recommendation as the primary reason for participating in the HVAC Diagnostic and Tune-Up Program. Additionally, 85 to 95 percent of participating customers noted that information from the contractor was a crucial factor in their decision to have HVAC diagnostic and tune-up services. The HVAC Diagnostic and Tune-Up Program was designed such that the Kentucky Power program staff marketed the program to HVAC dealers. In turn, the participating HVAC dealers were encouraged, and expected, to promote the program to eligible customers.

Figure 8 Customer Motivation for Participation



According to participating HVAC dealers surveyed (n=7), the main factors motivating customer participation were:

- Energy savings (38%)
- Bill savings (31%)
- Comfort (15%)
- Environmental issues (8%)
- The customer's bottom line (8%).¹⁰

Ninety-two (92) percent of participating HVAC dealers surveyed stated that their primary reason for participating in both the KPCO Small Commercial Heat Pump/Air Conditioner Incentive Program and the HVAC Diagnostic and Tune-up Program was that the programs were good for customers. Participating HVAC dealer rebates were also a significant motivator.

According to the 7 participating HVAC dealers surveyed, 57 percent of HVAC dealers surveyed noted that the dealer incentive was very important in their decision to participate.

4.3.3 Customer Demographics

The residential participants surveyed were primarily homeowners (97 percent) that lived in a single-family attached or detached home, followed by mobile and multifamily units. The small commercial participants surveyed were primarily offices, followed by retail.

¹⁰ The customer's bottom line is financial (i.e. the financial benefit of the diagnostic and tune-up service and participation in the Kentucky Power program outweighed the cost of the service).

Figure 9 Residential Participant Demographics, n=58

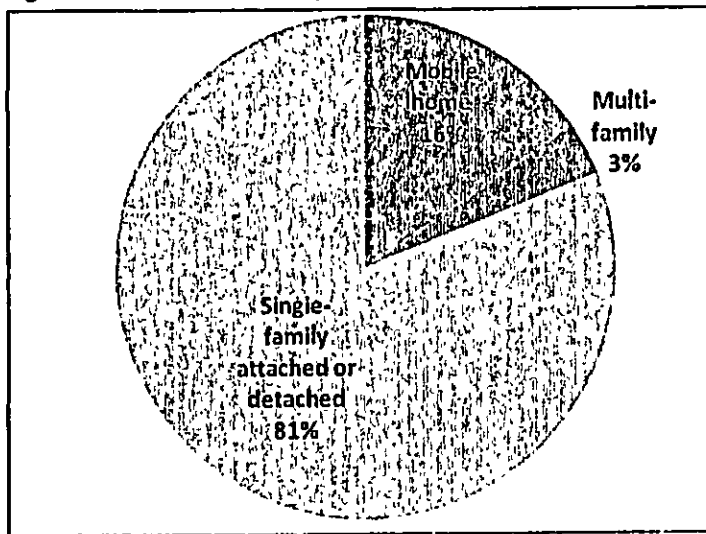
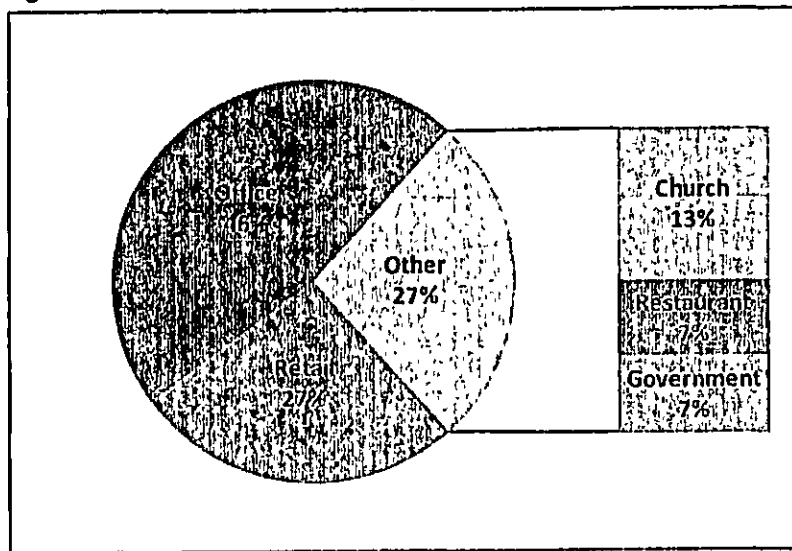


Figure 10 Small Commercial Participant Demographics, n=15



4.4 Program Tracking & Incentive Processing

Kentucky Power submitted bi-annual reports to the Kentucky PSC with each program's progress to-date, including participation, estimated energy and demand savings, and budget. The utility also reviewed actual, projected and summary program data with the DSM Collaborative on a quarterly basis.

Customer rebate applications were processed by Kentucky Power program staff. Staff reviewed the applications for completeness and eligibility of the customer/dealer based the date received. Each customer application was assigned a unique identifier. The hard-copy rebate applications were labeled with the assigned unique identifier and payment request number, then grouped and stored into a binder.

Kentucky Power's program tracking system was comprised of three databases:

KCPO Customer Records (MACCS) is an internal Intranet-based database. A note is entered in the customer record with the DSM Program and the date the rebate application was received. KPCO Customer Service Representative's can access the note if a customer calls about their rebate status. Data from the rebate application is entered into the DEMO page, including the equipment type, tonnage, date, square footage of home. KPCO's load management team utilizes the data to monitor program performance.

Program Log is an Excel-based database containing data from the rebate application that is available on a shared drive and is only available to specific KPCO staff. Each KPCO DSM Program has its own program log. Kentucky Power collects the following data for the program log database:

- **Customer Information:** name, account number, address (service and mailing), phone number, sector (residential or commercial), peak billing demand, unique identification number.
- **Dealer Name**
- **A/C Usage:** total square footage of A/C equipment zone, number of days operated in a week, number of hours operated in a day.
- **Programmable Thermostat:** typical set point, setback temperature, time of setback.
- **Cooling/Heating Unit Information**
 - Inspection date and time.
 - Equipment type, size, efficiency level, brand, age and ARI reference number.
 - Model number of outdoor condenser, indoor evaporator and furnace.
 - Whether ductwork is installed in conditioned space.
- **HVAC Performance Diagnostic and Tune-Up Data**
 - Outdoor ambient temperature.
 - Discharge/suction pressure and line temperatures before and after tune-up.
 - Refrigerant type, quantity removed or added (reason), total system charge and manufacturer recommended charge.
 - Indoor blower volts.
 - Outdoor compressor volts.
 - Blower motor and compressor amps before and after tune-up.
 - Condenser fan amps before and after tune-up.

Electronic Payment Request (PeopleSoft). Each rebate application has two payment requests, one for the customer and one for the dealer. The payment request includes the accounting code, unique identification number, customer/dealer name and address, dealer Federal Tax ID and rebate amount.

Prior to approval, the Electronic Payment Request was reviewed by the Kentucky Power program coordinator. The coordinator ensured the account number, program account, rebate amount and unique identifier are correct. Once approved, the Electronic Payment Request was submitted electronically to the AEP Accounting Group in Canton, Ohio and a rebate check issued and mailed.

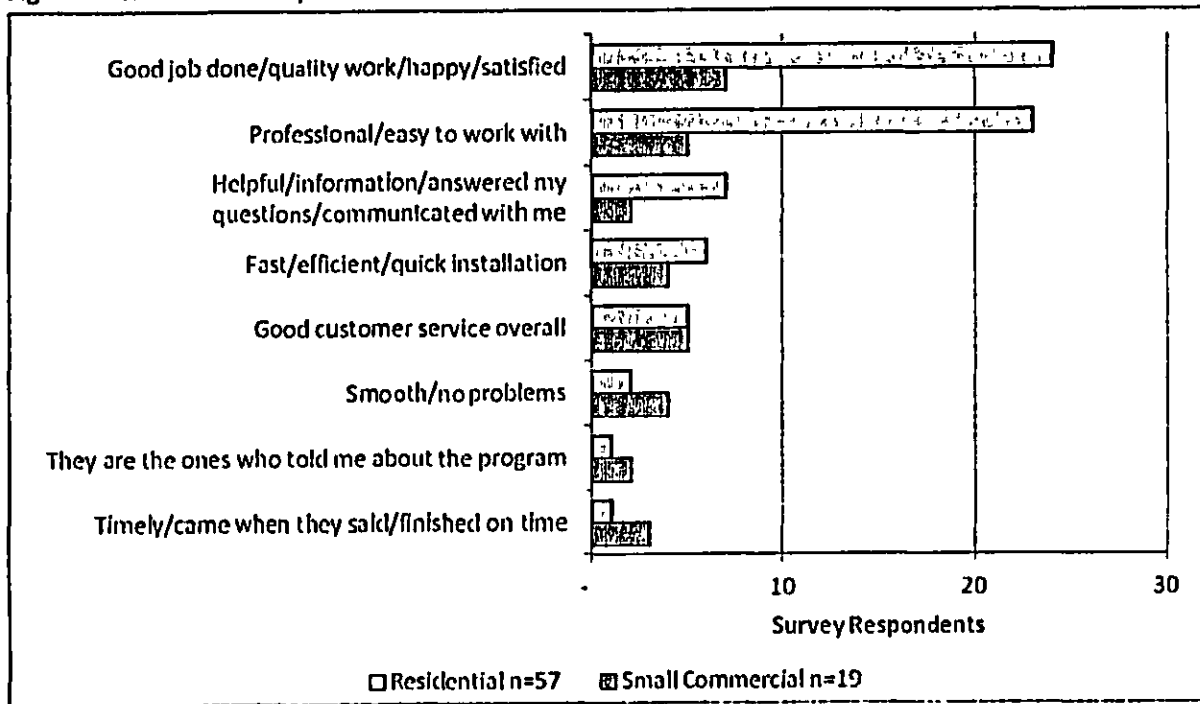
4.5 Program Satisfaction

Overall, participants and HVAC dealers were very satisfied with the HVAC Diagnostic and Tune-Up Program.

4.5.1 Participating Customer Satisfaction

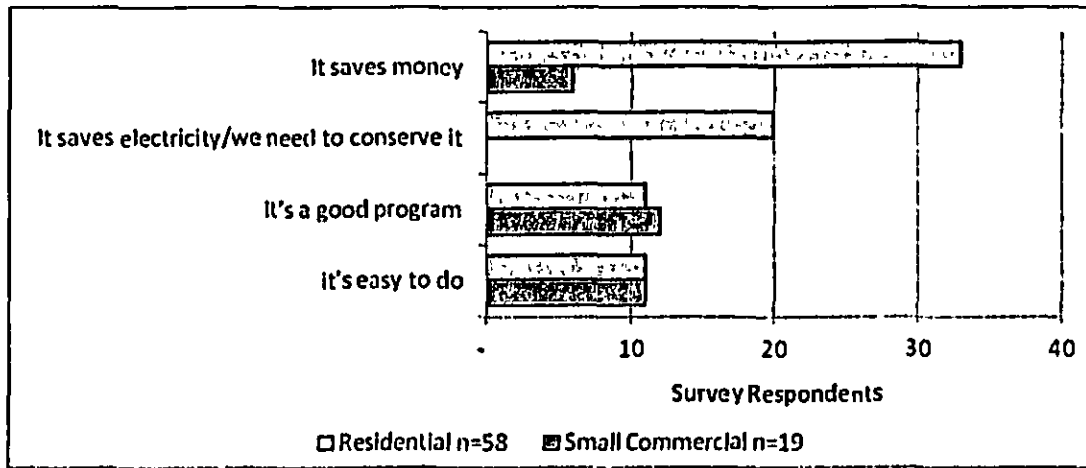
The majority of participating customers surveyed (95 to 98 percent) would recommend their contractor to someone else. Forty-five (45) percent of residential and 21 percent of small commercial customers have already recommended them.

Figure 11 Reasons Participant Would Recommend their Contractor



One hundred (100) percent of residential and 95 percent of small commercial participating customers surveyed would recommend the program to others. Twenty (20) participating customers had already recommended the program. Participants noted that HVAC diagnostic and tune-up services save money and electricity.

Figure 12 Reasons Participant Would Recommend the Program



According to the participant survey, residential participating customers are the most satisfied with the program, particularly the contractor, incentive offered, interaction with Kentucky Power and response to requests for information/assistance on forms. Small commercial participating customers were somewhat or very satisfied with most aspects of the program. Based on the participant surveys, the areas that may be improved include:

- Residential and small commercial incentive processing time.
- Small commercial requests for information and assistance on forms.
- Small commercial interaction with Kentucky Power program staff.

Table 10 Residential Participant Satisfaction with the Program, n=58

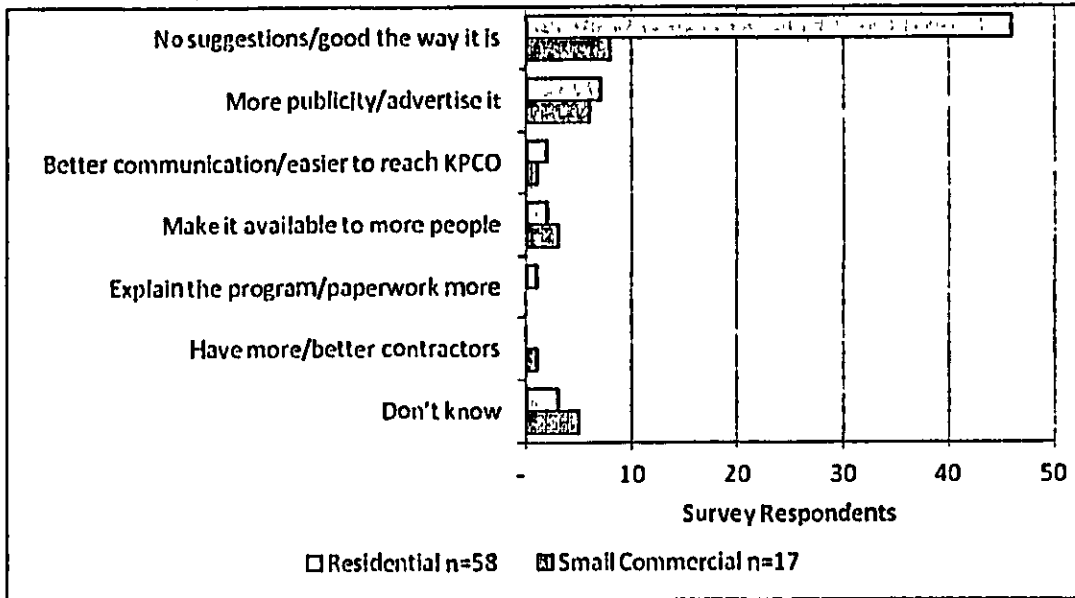
	N/A	Very Unsatisfied	Somewhat Unsatisfied	Neutral	Somewhat Satisfied	Very Satisfied
Contractor	0%	0%	0%	2%	2%	97%
Incentive processing time	7%	0%	0%	2%	14%	78%
Incentive offered	3%	0%	2%	0%	5%	90%
Interaction with KPCO staff	0%	0%	0%	0%	3%	97%
Response to requests for information/assistance on forms	3%	0%	0%	2%	2%	93%
Program overall	0%	0%	0%	0%	2%	98%

Table 11 Small Commercial Participant Satisfaction with the Program, n=19

	N/A	Very Unsatisfied	Somewhat Unsatisfied	Neutral	Somewhat Satisfied	Very Satisfied
Contractor	0%	0%	0%	5%	26%	68%
Incentive processing time	5%	5%	0%	5%	26%	58%
Incentive offered	0%	0%	0%	21%	32%	47%
Interaction with KPCO staff	37%	0%	5%	16%	5%	37%
Response to requests for information/assistance on forms	42%	5%	5%	5%	16%	26%
Program overall	0%	0%	0%	21%	37%	42%

Most participating customers surveyed felt that the HVAC Diagnostic and Tune-Up Program was good the way it is. However, some participants suggested increased publicity and advertising (see Figure 13). Small commercial customers recommended increasing the incentive.

Figure 13 Participant Suggestions for Program Improvement



4.5.2 Participating Dealer Satisfaction

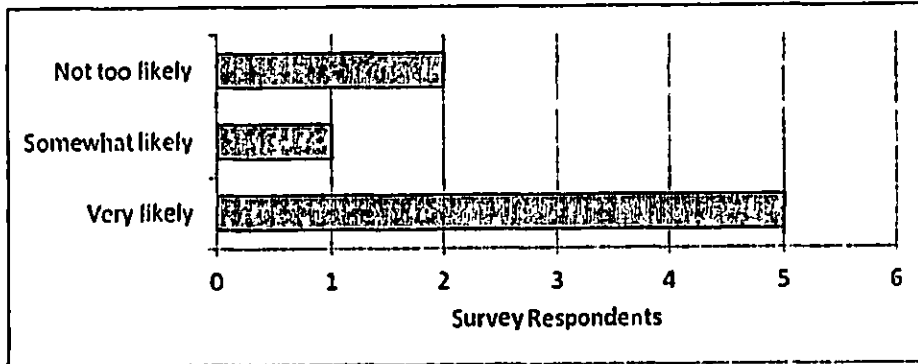
HVAC dealer participation was a key element to the HVAC Diagnostic and Tune-Up Program. Participating HVAC dealers promoted the program to eligible customers and performed the diagnostic and tune-up services on heat pumps/central air conditioners. Eighty to ninety (80 to 90) percent of participants surveyed noted that the HVAC dealer provided information that was a crucial factor in deciding to have HVAC diagnostic and tune-up services.

In 2010 and 2011, 23 out of 101 participating HVAC dealers received a rebate for participating in the HVAC Diagnostic and Tune-Up Program or the Small Commercial Heat Pump/Air Conditioner Program.¹¹ AEG conducted surveys of eight dealers that did not submit a rebate in 2011. According to these dealers, there were a variety of reasons for not submitting a rebate application, ranging from an illness causing a drop in work to not having many KPCO customers. Sixty-three (63) percent of these dealers think that it is very likely that they will submit a rebate application in 2012.

According to 86 percent of participating HVAC dealers surveyed, it is very likely that program participation will increase in 2012.

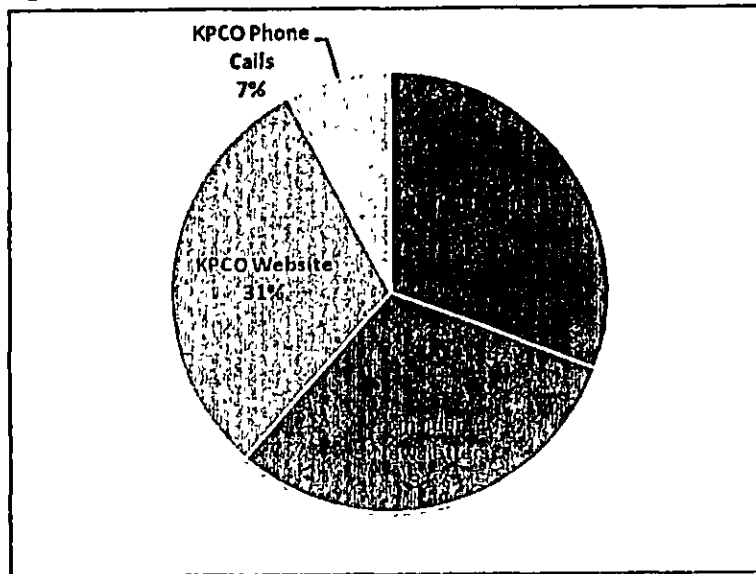
¹¹ The 101 participating HVAC dealers may also participate in the Residential Heat Pump/Air Conditioner Program. However, the Residential Heat Pump/Air Conditioner Program was not evaluated and these results pertain only to the HVAC Diagnostic and Tune-up Program and Small Commercial Heat Pump/Air Conditioner Program.

Figure 14 Likelihood of Non-Participating HVAC Dealer Submitting Rebate In 2012, n=8



It is very important to HVAC dealers that they are listed on the KPCO website as a participating dealer. Participating dealers prefer being notified of program updates via email, the KPCO program website and newsletters rather than via a phone call.

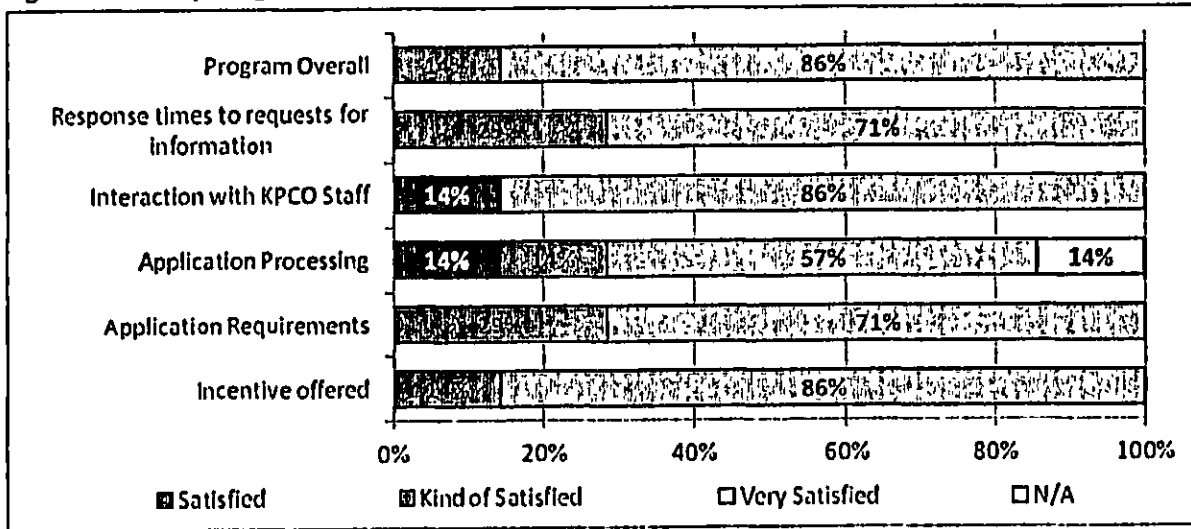
Figure 15 Participating HVAC Dealer Preferred Contact Medium, n=7



The participating HVAC dealers surveyed are satisfied with the program. The areas that may be improved include HVAC dealer interaction with KPCO program staff and application processing. Participating HVAC dealers recommended additional advertising and 'getting the information out.'

According to the HVAC dealers, the HVAC Diagnostic and Tune-Up Program was good for business.

Figure 16 Participating HVAC Dealer Satisfaction with the Program, n=7



5. Impact Evaluation Findings

Impact evaluations verify the energy and demand savings directly associated with a program and assess the cost-effectiveness of the DSM program.

5.1 Gross Energy and Demand Savings

AEG determined the gross energy and demand savings of a representative sample based on the International Performance Measurement and Verification Protocols ("iPMVP") Option A. Option A involves engineering calculations of gross savings using historical data. Engineering calculations referenced from the *State of Illinois Technical Reference Manual*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts. Gross impacts were calculated for residential and small commercial central air conditioner and heat pump diagnostic and tune-up services. Unit characteristics (SEER, EER, HSPF, size, etc), collected from participating customers, were utilized to calculate the specific impacts for Kentucky Power participants.

The equations used to determine gross energy impacts are:

$$\text{Central Air Conditioner} = \frac{EFLH_{cool} \times \frac{Btu}{H} \times \left(\frac{1}{SEER_{cac}} \right)}{1000} \times MF_e$$

$$\text{Heat Pump} = \left(\frac{EFLH_{heat} \times \frac{Btu}{H} \times \left(\frac{1}{SEER_{hp}} \right)}{1000} \times MF_e \right) + \left(\frac{EFLH_{heat} \times \frac{Btu}{H} \times \left(\frac{1}{HSPF_{hp}} \right)}{1000} \times MF_e \right)$$

Where:

$EFLH_{cool}$ = annual cooling load hours

$EFLH_{heat}$ = annual heating load hours

Btu/H = size of equipment

SEER = SEER efficiency of existing unit receiving maintenance
MFe = maintenance energy savings factor

The equations used to determine gross demand impacts for heat pumps are:

$$\text{Central Air Conditioner} = \frac{\text{Btu}}{H} \times \frac{1}{\text{EER}_{\text{Reac}}} \times \frac{1}{1000} \times \text{MFd} \times \text{Coincidence Factor}$$

$$\text{Heat Pump} = \frac{\text{Btu}}{H} \times \frac{1}{\text{EER}_{\text{hp}}} \times \frac{1}{1000} \times \text{MFd} \times \text{Coincidence Factor}$$

Where:

Btu/H = size of equipment
EER = EER efficiency of existing unit receiving maintenance
MFd = maintenance demand savings factor
Coincidence Factor = 0.915

Table 12 2010-2011 Gross Savings per Unit, Residential

Measure	Gross Summer Savings per Unit (kW)	Gross Winter Savings per Unit (kW)	Gross Energy Savings per Unit (kWh)
Heat Pump Tune Up	0.05	0.20	607
Central Air Conditioner Tune Up	0.05	0.00	163

Table 13 2010-2011 Gross Savings per Unit, Small Commercial

Measure	Gross Summer Savings per Unit (kW)	Gross Winter Savings per Unit (kW)	Gross Energy Savings per Unit (kWh)
Heat Pump Tune Up	0.07	0.30	898
Central Air Conditioner Tune Up	0.09	0.00	297

Table 14 2010-2011 Total Gross Demand and Energy Savings, Residential

Measure	Gross Summer Savings (kW)	Gross Winter Savings (kW)	Gross Energy Savings (kWh)
Heat Pump Tune Up	35.50	148.04	443,195
Central Air Conditioner Tune Up	11.64	0.00	37,792
Program Total	47.15	148.04	480,987

Table 15 2010-2011 Total Gross Demand and Energy Savings, Small Commercial

Measure	Gross Summer Savings (kW)	Gross Winter Savings (kW)	Gross Energy Savings (kWh)
Heat Pump Tune Up	7.52	31.96	95,199
Central Air Conditioner Tune Up	4.21	0.00	13,661
Program Total	11.72	31.96	108,859

5.2 Net Energy and Demand Savings

Net energy and demand savings are the gross savings attributable to the HVAC Diagnostic and Tune-Up Program, not accounting for impacts resulting from other influences such as free ridership or spillover. Net impacts were calculated by applying a net-to-gross ("NTG") factor to gross impacts.

$$\text{NTG Ratio} = 1 - \text{Free Ridership} + \text{Spillover}$$

Free ridership and spillover calculations are described in the following subsections. Based on the process evaluation survey results, AEG has determined the net-to-gross ratios to be 77 percent for residential participants and 78 percent for small commercial participants. Tables 16 and 17 present the net demand and energy savings achieved for residential and small commercial customers.

Table 16 2010-2011 Net Demand and Energy Savings, Residential

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)
Heat Pump Tune Up	77%	27.34	113.99	341,260
Central Air Conditioner Tune Up	77%	8.97	0.00	29,100
Program Total		36.30	113.99	370,360

Table 17 2010-2011 Net Demand and Energy Savings, Commercial

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)
Heat Pump Tune Up	78%	5.86	24.93	74,255
Central Air Conditioner Tune Up	78%	3.28	0.00	10,655
Program Total		9.15	24.93	84,910

5.2.1 Free Ridership

Free ridership estimates the HVAC diagnostic and tune-up services that would have occurred without the Kentucky Power Incentive. Four questions in the participating customer survey were designed to determine the portion of a customer's savings that should be attributed to free ridership.

Question 1. If you had not received the Kentucky Power Incentive, how likely is it you would have had this service performed on your equipment?

The more likely it was the participating customer would have performed the service on their equipment without the Kentucky Power Incentive, the higher the probability that the customer was a free rider. For example, if a customer responded 'Very Likely,' free ridership probability ranged from 50 to 100 percent.

Question 2. How important was the Kentucky Power Incentive in your decision to have this diagnostic and tune-up service performed on your _____ [central air conditioner/heat pump]?

The higher the importance of the Kentucky Power Incentive on the customer's decision to have the diagnostic and tune-up service, the lower the probability that the customer was a free rider.

Question 3. Prior to learning about this program, did you have specific plans to schedule a diagnostic and tune-up of your _____ [central air conditioner/heat pump]?

Question 4. Was it necessary to change your plans to qualify for the program?

The final two questions indicate whether the customer had plans to have the service performed prior to participating in the HVAC Diagnostic and Tune-Up Program. Customers that had prior plans for tune-up services and did not have to change their plans to qualify for an incentive were likely to be free riders.

Each customer was assigned a value based on the probability that there was free ridership. Table 18 presents the free ridership probability scoring mechanism for Questions 1 and 2.

Table 18 Free Ridership Probability Scores, Questions 1 and 2

Q1 Response	Q2 Response	Min	Max	Estimate
Not Likely	Very Important	0%	0%	0%
Not Likely	Somewhat Important	0%	20%	10%
Not Likely	Slightly Important	0%	30%	15%
Not Likely	Not Important	0%	40%	20%
Somewhat Likely	Very Important	30%	50%	40%
Somewhat Likely	Somewhat Important	30%	60%	45%
Somewhat Likely	Slightly Important	40%	70%	55%
Somewhat Likely	Not Important	40%	80%	60%
Very Likely	Very Important	50%	100%	75%
Very Likely	Somewhat Important	60%	100%	80%
Very Likely	Slightly Important	70%	100%	85%
Very Likely	Not Important	80%	100%	90%

The retailer probability from Questions 1 and 2 was adjusted to account for whether the customer had plans to have the service performed prior to program participation (Questions 3 and 4).

Table 19 Free Ridership Probability Scores, Questions 3 and 4

Q3 Response	Q4 Response	Estimate
No		0%
Yes	Yes	5%
Yes	No	10%

Free Ridership = Question 1&2 + Question 3&4

The weighted mean of the participant probabilities resulted in a free ridership estimate of 60 percent for residential customers (see Table 20) and 27 percent for commercial customers (see Table 21) and. Therefore, 27 percent of commercial customers and 60 percent of residential customers that received HVAC diagnostic and tune-up services through the HVAC Diagnostic Tune-Up Program would have received the services without the KPCO incentive.

Table 20 Free Ridership Weighted Probability, Residential

Free Rider Probability	Observations	Weight	Weighted Value
0%	10	0.17	0%
5%	1	0.02	0%
30%	1	0.02	1%
40%	4	0.07	3%
45%	6	0.10	5%
75%	5	0.09	6%
80%	7	0.12	10%
85%	14	0.24	21%
90%	7	0.12	11%
95%	1	0.02	2%
100%	2	0.03	3%
Free Ridership Estimate			61%

Table 21 Free Ridership Weighted Probability, Small Commercial

Free Rider Probability	Observations	Weight	Weighted Value
0%	8	0.42	0%
10%	3	0.16	2%
20%	1	0.05	1%
40%	1	0.05	2%
50%	1	0.05	3%
55%	1	0.05	3%
75%	2	0.11	8%
80%	1	0.05	4%
90%	1	0.05	5%
Free Ridership Estimate			27%

5.2.2 Spillover

Spillover estimates the additional diagnostic and tune-up services that were due to the influence of the HVAC Diagnostic and Tune-Up Program. One participating customer question was designed to determine the portion of a customer's savings that should be attributed to spillover.

Question 1. Since receiving your diagnostic and tune-up service have you replaced the air filter for the _____ [central air conditioner/heat pump]?

If participating customers replaced the air filter for their central air conditioner or heat pump, there was participant spillover. Therefore, if a participating customer responded 'No,' the probability that there was spillover was 0 percent.

Each customer was assigned a value based on the probability that there was spillover. Table 22 presents the spillover probability scoring mechanism.

Table 22 Spillover Probability Scores

Q1 Response	Min.	Max.	Estimate
No	0%	0%	0%
Yes	20%	60%	40%

The weighted mean of participant probabilities provided a spillover estimate of 37 percent for residential customers and 5 percent for small commercial customers (see Tables 23 and 24). Therefore, 37 percent of residential customers and 5 percent of small commercial that had HVAC diagnostic and tune-up services were influenced by the KPCO program to perform additional maintenance on their equipment.

Table 23 Spillover Weighted Probability, Residential

Spillover Probability	Observations	Weight	Weighted Value
0%	4	0.07	0%
40%	54	0.93	37%
Spillover Estimate			37%

Table 24 Spillover Weighted Probability, Small Commercial

Spillover Probability	Observations	Weight	Weighted Value
0%	15	0.88	0%
40%	2	0.12	5%
Spillover Estimate			5%

5.3 Program Site Inspections and Performance Verification

AEG accompanied participating HVAC dealers during the performance of the diagnostics and tune-ups for central air conditioners and heat pumps. The purpose was to conduct site inspections and performance verifications on eight projects to ensure proper diagnostic and tune-up performance, perform quality assurance/quality control, and verify application information of the rebated services.

The site inspections provided a representative sample of all program projects. Diagnostic and tune-ups of heat pumps and central air conditioners were conducted at all building types including residential, churches, and retail. Proper performance verification was confirmed at all locations.

5.4 Program Cost-Effectiveness

Cost-effectiveness analysis compares the costs and benefits derived from the program against a baseline of what could occur in the absence of the program. Cost-effectiveness analysis indicates whether the efficient technology(s) improve a customer's financial position, decrease overall energy costs to ratepayers, or raise society's well-being. A program is considered cost-effective if the benefit-cost ratio is greater than 1.0.

AEG analyzed the cost-effectiveness of the HVAC Diagnostic Program utilizing four standard cost-effectiveness tests taken from the California Standard Practices Manual.¹² Each test analyzes cost-effectiveness from a different perspective and answers a separate question:

- **Participant Cost Test:** Compares customer costs and benefits of installing the measure. Will the participant benefit over the life of the measure?
- **Program Administrator Cost Test (Utility Cost Test):** Comparison of program administrator costs to supply-side resource benefits. Will utility costs to save energy be less than utility costs to deliver the same amount of energy?
- **Ratepayer Impact Measure:** Measures the impact of the DSM program on utility rates if rates were to be adjusted to account for the program. Comparison of utility program costs and bill reductions associated with energy savings to supply-side resource benefits. Will customer rates increase?
- **Total Resource Cost Test:** Comparison of program administrator and customer costs to utility resource savings. Will the total costs of energy in the utility service territory decrease?

Results from the impact evaluation, utilizing IPMVP best practices, are utilized in the four cost-effectiveness tests taken from the California Standard Practices Manual.

¹² The California Standard Practices Manual details cost-effectiveness guidelines and procedures for standardized cost-effectiveness evaluations.

Kentucky Power specific inputs, including avoided costs, discounts rates, participation and incentives, were used to conduct the cost-effectiveness analysis. Bencost, an updated version of a public domain model that AEG customized for Kentucky Power, was utilized to perform the cost-effectiveness modeling (see Appendix E). Bencost is an input-output model that calculates all four cost-effectiveness tests. All program costs and benefits are discounted to present-day dollar values in order to accurately compare future benefits with current costs.

Table 25 Program Cost-Effectiveness Results, Residential

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	0.88	\$103,024	\$90,844	-\$12,180
Ratepayer Impact Measure Test	0.35	\$260,077	\$90,844	-\$169,234
Participant Cost Test	2.44	\$72,150	\$175,840	\$103,690
Total Resource Cost Test	0.71	\$127,074	\$90,844	-\$36,230

Table 26 Program Cost-Effectiveness Results, Small Commercial

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	0.75	\$27,618	\$20,645	-\$6,973
Ratepayer Impact Measure Test	0.32	\$63,625	\$20,645	-\$42,980
Participant Cost Test	3.57	\$11,400	\$40,686	\$29,286
Total Resource Cost Test	0.75	\$27,618	\$20,645	-\$6,973

Table 27 Measure Cost-Effectiveness Results, Residential

Test	Heat Pump	Central Air	Program Total
	Tune Up	Conditioner Tune Up	
Utility Cost Test	1.09	0.23	0.88
Ratepayer Impact Measure Test	0.38	0.16	0.35
Participant Cost Test	2.82	1.24	2.44
Total Resource Cost Test	0.88	0.19	0.71

Table 28 Measure Cost-Effectiveness Results, Small Commercial

Test	Heat Pump	Central Air	Program Total
	Tune Up	Conditioner Tune Up	
Utility Cost Test	0.96	0.25	0.75
Ratepayer Impact Measure Test	0.37	0.16	0.32
Participant Cost Test	4.22	2.07	3.57
Total Resource Cost Test	0.96	0.25	0.75

It needs to be noted that very low avoided costs, especially the extremely low capacity costs in the Kentucky Power service territory, have a significant negative impact on the program's cost-effectiveness. The 2012 Kentucky Power capacity cost is \$6/kW-year, compared to a PJM average of over \$100/kW-year. This cost differential partially accounts for the low benefit-cost ratios.

Program cost-effectiveness was also greatly affected by the incentive paid to participating contractors.¹³ The inclusion of central air conditioner tune-ups also drive the cost-effectiveness of the program down. With the reduction of contractor incentive to \$25 per tune-up and the removal of central air conditioner tune-ups, both the residential and commercial programs would be cost-effective and pass the TRC test. Tables 29 and 30 provide the cost-effectiveness if the contractor incentives are reduced to \$25 per tune-up and central air conditioner tune-ups are removed.

Table 29 Program Cost-Effectiveness Results if Contractor Incentive Reduced & CAC Removed, Residential

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	1.32	\$64,324	\$85,062	\$20,738
Ratepayer Impact Measure Test	0.41	\$209,037	\$85,062	-\$123,975
Participant Cost Test	2.82	\$54,750	\$154,203	\$99,453
Total Resource Cost Test	1.03	\$82,574	\$85,062	\$2,488

Table 30 Program Cost-Effectiveness Results if Contractor Incentive Reduced & CAC Removed, Small Commercial

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	1.10	\$16,819	\$18,528	\$1,709
Ratepayer Impact Measure Test	0.38	\$48,307	\$18,528	-\$29,780
Participant Cost Test	4.22	\$7,950	\$33,561	\$25,611
Total Resource Cost Test	1.10	\$16,819	\$18,528	\$1,709

Going forward, reducing contractor incentives in the HVAC Diagnostics and Tune-Up Program is vital to reaching acceptable cost-effectiveness levels. If the contractor incentives are reduced and central air conditioner tune-ups are removed, the program will be cost-effective and have a positive impact on the Kentucky Power service territory.

Although the HVAC Diagnostics and Tune-Up Program did not have a cost-effectiveness ratio greater than 1.0, the entire portfolio being evaluated is cost-effective in 2011. Table 16 provides the cost-effectiveness for the 2010-2012 Demand Side Management Program Portfolio being evaluated by AEG.¹⁴

Table 31 Kentucky Power Portfolio Cost-Effectiveness Results, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	2.13	\$720,104	\$1,533,730	\$813,626
Ratepayer Impact Measure Test	0.44	\$3,507,956	\$1,533,730	-\$1,974,227
Participant Test	5.13	\$486,703	\$2,499,101	\$2,012,397
Total Resource Cost Test	1.57	\$975,217	\$1,533,730	\$558,512

¹³ Contractors receive a direct payment of \$50 for every tune-up they perform.

¹⁴ The 2010-2012 Demand Side Management Program Portfolio being evaluated includes the Small Commercial Heat Pump/Air Conditioner Program, Residential Efficient Products Program, Commercial Incentive Program, and Residential and Small Commercial HVAC Diagnostic and Tune-Up Program.

6. Key Findings and Recommendations

6.1 Key Program Findings

The stated goal of the HVAC Diagnostic and Tune-Up Program is to reduce energy use by conducting a diagnostic performance check on residential and small commercial unitary air conditioning and heat pump units, air restricted indoor and outdoor coils, and over and under refrigerant charge.

6.1.1 Program Performance Indicators

In 2010 and 2011, Kentucky Power rebated 1,143 residential and small commercial diagnostic and tune-ups through the HVAC Diagnostic and Tune-Up Program. Sixty-six (66) percent of the systems were residential heat pumps, 20 percent residential central air conditioners, 9 percent small commercial heat pumps and 4 percent small commercial central air conditioners. The program was approved in August 2010, two months later than anticipated in the Kentucky PSC filing, and implemented in September.

KPCO achieved 22 percent of the 130 participant goal in 2010 at an actual cost per participant lower than originally budgeted. The program exceeded the 700 participant goal in 2011 by approximately 60 percent. However, small commercial cost per participant was higher than originally budgeted.

Table 32 Program Participation, Goals Originally Filed and Actual

	2010		2011	
	Goal	Actual	Goal	Actual
Residential CAC	60	0	325	232
Residential HP	40	28	215	730
Small Commercial CAC	26	0	136	46
Small Commercial HP	4	1	24	106
Total	130	29	700	1,114

In 2010 and 2011, 23 out of 101 participating HVAC dealers participated in the HVAC Diagnostic and Tune-Up Program or Small Commercial Heat Pump/Air Conditioner Incentive Program. The three most active HVAC dealers performed 69 percent of the diagnostic and tune-up services. HVAC dealers surveyed noted that the KPCO dealer incentives and being listed on the KPCO website as a participating dealer were significant motivators for participation.

6.1.2 Program Tracking

The program tracking and monitoring system accurately tracks program data and processes rebates. However, participating customers surveyed noted that incentive processing times could be improved.

6.1.3 Program Awareness and Marketing Strategies

The marketing strategy for the program included a combination of Kentucky Power program staff and participating HVAC dealers. KPCO staff promoted the programs directly to HVAC dealers and, in turn, the participating dealers were expected to promote the program to eligible customers.

According to survey respondents, customers most often learned of the program from a Kentucky Power employee, followed closely by the heating and cooling contractor. Contractor recommendations were

the primary reason for customer participation. Eight-five (85) to 95 percent of participating customers surveyed noted that information from the contractor was a crucial factor in their decision to have HVAC diagnostic and tune-up services. Participating customers and HVAC dealers surveyed noted that the program would benefit from increased publicity and advertising.

6.1.4 Best Practices

Kentucky Power's program design and processes are largely consistent with best practices for similar energy efficiency programs. In 2011, HVAC tune-ups or controls upgrades were featured in 39 percent of residential energy efficiency programs and 48 percent of commercial programs.¹⁵

The challenges posed by lack of information are ubiquitous in energy efficiency programs. Investment in education and outreach typically boost awareness and increase program participation. Actively engaging key stakeholders, such as HVAC contractors or home/business owners, is crucial to the success of any energy efficiency program.

Many energy efficiency programs suffer from lack of staff resources. Additional staff personnel may be necessary to ensure that program goals are met and that the program delivers the intended results. The increased program costs of additional staff are often recouped by improved performance.

6.1.5 Verify Program Impacts

AEG has determined the net-to-gross ratio for the HVAC Diagnostic and Tune-Up Program is 78 percent for small commercial customers and 77 percent for residential customers. Participating small commercial customer probabilities free ridership was estimated at 27 percent and spillover at 5 percent. Residential customer free ridership was estimated at 60 percent and spillover at 37 percent. Tables 32 and 33 present the net energy savings and cost-effectiveness ratios for residential and small commercial, respectively.

Program cost-effectiveness was greatly affected by the incentives paid to participating contractors. The inclusion of central air conditioner tune-ups also drive the cost-effectiveness of the program down. With the reduction of the contractor incentive to \$25 and the removal of the central air conditioner tune-ups, both the residential and commercial programs would be cost-effective and pass the TRC test. Note that very low avoided costs, especially the extremely low capacity costs in the Kentucky Power service territory, have a significant negative impact on the program's cost-effectiveness.

Table 33 2011 Energy Savings by Equipment Type, Residential

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Heat Pump Tune Up	77%	27.34	113.99	341,260	0.88
Central Air Conditioner Tune Up	77%	8.97	0.00	29,100	0.19
Program Total		36.30	113.99	370,360	0.71

¹⁵ Consortium for Energy Efficiency. (2011) *State of the Efficiency Program Industry*. See www.cee1.org/files/2011%20CEE%20Annual%20Industry%20Report.pdf

Table 34 2011 Energy Savings by Equipment Type, Small Commercial

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Heat Pump Tune Up	78%	5.86	24.93	74,255	0.96
Central Air Conditioner Tune Up	78%	3.28	0.00	10,655	0.25
Program Total		9.15	24.93	84,910	0.75

AEG accompanied participating HVAC contractors during the performance of the diagnostics and tune-ups for air conditioners and heat pumps. Proper performance verification was confirmed at all locations.

6.2 Recommendations

AEG has several recommendations on how to improve the program. These include:

6.2.1 Hire Implementation Contractor

AEG recommends that Kentucky Power hire an implementation contractor to implement Kentucky Power's residential and small commercial HVAC programs, including, but not limited to, the Residential and Small Commercial HVAC Diagnostic and Tune-Up Program, the Small Commercial Heat Pump/Air Conditioner Incentive Program, the Residential High Efficiency Heat Pump Program, Mobile Home High Efficiency Heat Pump, and Mobile Home New Construction.

Kentucky Power has a small staff to run and oversee Kentucky Power's numerous energy efficiency programs. Some of the KPCO programs have implementation contractors that perform the day-to-day operations for the program, but the residential and small commercial HVAC programs are run completely by KPCO staff. Therefore, KPCO staff is responsible for marketing and promotional activities, including visiting participating and potential HVAC dealers across the KPCO territory, processing rebate applications, tracking rebate applications and performing QA/QC inspections. Due to the limited resources, Kentucky Power has not yet conducted an inspection to ensure services are being performed properly.

The residential and small commercial HVAC programs share many similar components, including marketing and promotional activities and data tracking systems as well as the same participating HVAC dealers. Utilizing one implementation contractor to implement the HVAC programs will allow the programs to continue capitalizing on their similarities and increase the efficiency of program processes.

The implementation contractor will have, at a minimum, the following responsibilities:

- Develop program goals and budget.
- Develop marketing and promotional activities.
- Design and maintain a data tracking system.
- Process customer and contractor rebate applications.
- Engage and monitor participating HVAC dealers.
- Develop QA/QC procedures and conduct random inspections of completed work.

6.2.2 Consider Program Modifications

AEG recommends that Kentucky Power and the implementation contractor consider modifying the HVAC Diagnostic and Tune-Up Programs:

- Reduce the participating HVAC dealer incentives to \$25 (from the current \$50 incentive).
- Remove central air conditioner tune-ups from the program offering.
- Reduce the customer incentive to \$30 (from the current \$50 incentive).

Program cost-effectiveness was negatively affected by the incentives paid to HVAC dealers and the inclusion of central air conditioner tune-ups. The residential and commercial programs are cost-effective if the participating HVAC dealer incentive is reduced and central air conditioner tune-ups removed. Note that these modifications may not be necessary if there are program budgetary changes or changes to Kentucky Power's avoided costs.

Residential HVAC Diagnostic and Tune-Up Program free ridership is estimated at 60 percent. The program was designed such that the participating HVAC dealers promote the program to eligible customers. Therefore, participating HVAC dealers are likely to initially provide the diagnostic and tune-up services to existing clientele that may typically receive these services without an incentive, and then begin to promote the program to new clientele. Therefore, free ridership is anticipated to decrease as HVAC dealers promote the program to new clientele.

AEG recommends additional modifications to reduce free ridership:

- Modify customer eligibility. Customers are currently eligible for a rebate every 3 years, this should be extended to every 5 years to correspond with the measure life of the services.
- Require the customer to submit the rebate application. Other than receiving the diagnostic and tune-up service, the customer does not have to take any action to receive the incentive.
- KPCO market directly to residential customers and encourage HVAC dealers to market to customers that do not consistently receive these tune-up services.

6.2.3 Engage Participating HVAC Dealers

AEG recommends that Kentucky Power and the implementation contractor actively engage participating HVAC dealers and remove non-participating HVAC dealers from the participating HVAC dealer list if they have not actively participated in a KPCO HVAC program within the most recent 12 months.

HVAC dealer participation is crucial to the program; 92 percent of survey respondents noted that information from the HVAC dealer was a crucial factor in their decision to purchase and install efficient HVAC equipment. There are currently 101 HVAC dealers participating in the HVAC Diagnostic programs. In 2010 and 2011, only 23 dealers participated in the HVAC Diagnostic and Tune-Up Program or the Small Commercial Heat Pump/Air Conditioner Incentive Program.

AEG recommends collaboration between Kentucky Power and the implementation contractor to engage HVAC dealers and explore modifying the marketing and promotional activities. Kentucky Power and the implementation contractor should explore cooperative marketing with the participating HVAC dealers to

potentially leverage their marketing experience. Cooperative marketing would be offered on a temporary basis and the impact on participation reviewed before permanent changes were made to the program.

Appendix A. Participating Dealer Survey Guide (a)

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's HVAC Diagnostic and Tune-Up Program and Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. I'd like to talk with you about your experience with the programs and get some feedback. This is NOT a sales effort, but for research purposes only. The survey should take about 10 minutes. All comments will remain confidential.

According to our records, you ARE currently participating in one or both of these programs as a participating dealer. Is that correct?

- Yes 1 (CONTINUE)
No 2 (THANK THEM FOR THEIR TIME AND END CALL)
Don't Know 3 (ASK TO SPEAK WITH SOMEONE KNOWLEDGEABLE ABOUT THE PROGRAM, THEN REPEAT INTRO)

If the dealer does not recall the program(s): "These programs provide incentives to residential and small business customers to purchase and install energy efficient HVAC equipment and/or receive diagnostic and tune-up service for their heating or cooling equipment."

Program Awareness and Participation

1. Which Kentucky Power program is your company involved with?
 - a) HVAC Diagnostic and Tune-Up Program (3)
 - b) Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program
 - c) Both (4)
2. How did you first learn about the program(s)? Mark all mentioned
 - a) Kentucky Power employee (7)
 - b) KentuckyPower.com
 - c) grIdSMART
 - d) News Article
 - e) Customers
 - f) Email
 - g) Word of Mouth (business associates)
 - h) Trade Association
 - i) Supplier
 - j) Community event/meeting/presentation
 - k) Don't Know (1)
3. Why did you decide to participate in the program(s)?

"Good for customers" (6)
"It's a good way to help the customers." (1)
"Good outreach to customers (helps sell)" (1)
"Good for business." (1)
4. How long have you been involved in the program(s)? Read answer categories
 - a) Less than 1 Month
 - b) 1 - 3 Months
 - c) 4 - 6 Months (1)
 - d) More than 6 Months (4)
 - e) Unsure (2)

Program Performance

5. About how many projects have you completed for the....
 - a) HVAC Diagnostic and Tune-Up Program (*n/a*)
 - b) Small Commercial High Efficiency Heat Pump/Air Conditioner Program (*n/a*)
6. What type of equipment is installed/serviced *most frequently* under the....
 - a) HVAC Diagnostic and Tune-Up Program (*"Heat Pump" 4*)
 - b) Small Commercial High Efficiency Heat Pump/Air Conditioner Program (*"Heat Pump" 1*)
7. How influential have the customer program incentives been in moving projects forward in 2011?
 Read answers
 - a. Very Influential (*2*)
 - b. Somewhat Influential (*5*)
 - c. Not too Influential
 - d. Not at all Influential
8. About what percentage of your 2011 business can be attributed to the Kentucky Power programs?
"15 to 20 percent." (2)
9. Besides the customer incentive, what are the main factors driving program participation for customers? Read answers, mark all that apply
 - a) Energy savings (*5*)
 - b) Comfort (*2*)
 - c) Environmental issues (*1*)
 - d) The bottom line (*1*)
 - e) Other *"Bill Savings" (4)*
10. Thinking about the future, how likely is it that program participation will increase among customers in 2012? Read answer categories
 - a) Very likely (*6*)
 - b) Somewhat likely
 - c) Not too likely (*1*)
 - d) Not at all likely
11. Do you usually complete and submit the customer rebate form on the customer's behalf?
 - a) Yes (*6*)
 - b) No
"Not all the time"

Program Satisfaction

12. Please rate your satisfaction with the following program components on a five-point scale, where "1" means "Not at all satisfied" and "5" means "Very satisfied." How satisfied are you with the:

	1	2	3	4	5	Don't Know/Refused
a) Incentive offered				1	6	
b) Application Requirements				2	5	
c) Application Processing			1	1	4	
d) Interaction with Kentucky Power			1		6	
e) Response times to requests for Information				2	5	
f) Program overall				1	6	

Comments (verbatim)

"Kentucky Power staff is hard to get in touch with"

13. How important was the dealer incentive in getting you to participate in the program? Read answers
- a) Very Important (4)
 - b) Somewhat important (2)
 - c) Not too important (1)
 - d) Not at all important

14. What changes should be made to the program to make it more attractive to customers?

"Getting the information out."

"Less time to requalify, as of now there is a 3 year wait between services."

"Overall look at house instead of just heat pump."

Communication with Kentucky Power

15. How important is it to you that your company is listed on the Kentucky Power website as a participating program dealer? Read answers

- a) Very important (6)
- b) Somewhat important
- c) Not too important (1)
- d) Not at all important

16. What other types of marketing assistance from Kentucky Power would be helpful to your company in selling energy efficient equipment or services?

"Mail box stuffer" (1)

17. What is your preferred medium of contact from Kentucky Power for program updates or information about program? Read answers

- a) Emails from Kentucky Power (4)
- b) Insider newsletters (4)
- c) Kentucky Power website (4)
- d) Calls from Kentucky Power (1)

18. What are your primary sources of information on energy efficiency equipment and services?

- a) Online (5)
- b) Publications (2)
- c) Trade shows (1)
- d) Other "Magazines" (1)

Dealer Demographics

Finally, I'd like to ask you a couple of questions about your business.

19. How long have you been in business?

20. How many employees do you have?

Thank you for taking the time to answer my questions.

Appendix B. Participating Dealer Survey Guide (b)

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's HVAC Diagnostic and Tune-Up Program and Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. I'd like to talk with you about your experience with the programs and get some feedback. This is NOT a sales effort, but for research purposes only. The survey should take about 10 minutes. All comments will remain confidential.

According to our records, you ARE a Kentucky Power participating dealer. Is that correct?

- Yes 1 (CONTINUE)
No 2 (THANK THEM FOR THEIR TIME AND END CALL)
Don't Know 3 (ASK TO SPEAK WITH SOMEONE KNOWLEDGEABLE ABOUT THE PROGRAM, THEN REPEAT INTRO)

If the dealer does not recall the program(s): "These programs provide incentives to residential and small business customers to purchase and install energy efficient HVAC equipment and/or receive diagnostic and tune-up service for their heating or cooling equipment."

Program Awareness and Participation

1. How did you first learn about the program(s)? Mark all mentioned
 - a) Kentucky Power employee (5)
 - b) KentuckyPower.com (1)
 - c) gridSMART
 - d) News Article
 - e) Customers (1)
 - f) Email (1)
 - g) Word of Mouth (business associates) (1)
 - h) Trade Association
 - i) Supplier (1)
 - j) Community event/meeting/presentation
 - k) Don't Know (2)
2. Why did you decide to participate in the program(s)?

"Good program/good program for customers" (6)
"Rebates" (1)
3. How long have you been involved in the program(s)? Read answer categories
 - a) Less than 1 Month
 - b) 1-3 Months
 - c) 4-6 Months
 - d) More than 6 Months (8)

Program Performance

4. Do you perform HVAC diagnostic and tune-up services for residential or small commercial customers in Kentucky Power service territory?
 - a) Yes (7)
 - b) No (1)
5. Do you install energy efficient heat pumps or central air conditioners for small commercial customers in Kentucky Power service territory?
 - a) Yes (7)
 - b) No (1)

Continue if answered YES to Q4 or Q5. Otherwise, go to Q8.

6. Why have you not submitted any rebate applications?

"Not many accounts with Kentucky Power." (1)

"The tune-ups are hard to do. The people do not feel like doing the paperwork." (1)

"Haven't had anyone who has wanted it yet." (1)

"We have" (2)

"Sick" (2)

"Not Sure" (1)

7. How likely do you think it is that your company will submit a rebate application in 2012? READ ANSWERS

a) Very likely (5)

b) Somewhat likely (1)

c) Not too likely (2)

d) Not at all likely

Dealer Demographics

Finally, I'd like to ask you a couple of questions about your business.

8. How long have you been in business?

9. How many employees do you have?

Appendix C. Participating Residential Customer Survey Guide

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's HVAC Diagnostic and Tune-Up Program. I'd like to talk with you about your impression of the program and get some feedback. This is **NOT** a sales effort, but for research purposes only. The survey should only take 10 minutes. All comments will remain confidential.

According to our records, you participated in the HVAC Diagnostic and Tune-Up Program. Were you involved with the decision to participate in this program or is there someone else in your household who made that decision?

Involved with/made decision 1 (CONTINUE)

Someone else decided 2 (ASK TO SPEAK TO THAT PERSON, REPEAT INTRO)

If the customer does not recall the program: "The program provides rebates to customers who receive diagnostic and tune-up service for their heating or cooling equipment."

Program Participation

1. Did you receive a tune-up and diagnostic service for your:
 - a) Central air conditioner (go to Q2) (5)
 - b) Heat Pump (go to Q3) (25)
 - c) Both (ask Q2 & Q3) (28)
2. How many incentives did you receive for your air conditioner diagnostic and tune-up service?
 - a) 1 (31)
 - b) 2 (1)
3. How many incentives did you receive for your heat pump diagnostic and tune-up service?
 - a) 1 (48)
 - b) 2
4. How did you first become aware of the HVAC Diagnostic and Tune-Up Program? *First mention*
 - a) Participating HVAC Dealer (21)
 - b) Kentucky Power employee (23)
 - c) KentuckyPower.com
 - d) Email
 - e) News Article (6)
 - f) Kentucky Power Bill Insert (7)
 - g) Word of Mouth (Friend / Neighbor) (5)
 - h) Community event/meeting/presentation (1)
 - i) Don't Know/refused (1)

Free Ridership/Spillover

5. Prior to learning about this program, did you have specific plans to schedule a diagnostic and tune-up of your _____ [central air conditioner/heat pump]?
 - a) Yes (34)
 - b) No (go to Q8) (24)
6. Was it necessary to change your plans to qualify for the program?
 - a) Yes (44)
 - b) No (go to Q8) (14)
7. What changes were made? *Probe for timing and quantity/type of service*

"Compressors were put in."

"A valve was broken on the heat pump, so that was fixed."

"Found black mold in unit so they put a lot that kills bacteria."

8. If you had not received the Kentucky Power Incentive, how likely is it you would have had this service performed on your equipment? Read answer categories
 - a) Very likely (36)
 - b) Somewhat likely (10)
 - c) Not likely (11)
 - d) Don't know/refused (1)

9. How important was the Kentucky Power incentive in your decision to have this diagnostic and tune-up service performed on your _____ [central air conditioner/heat pump]? Read answer categories
 - a) Very important (38)
 - b) Somewhat important (15)
 - c) Not too important (1)
 - d) Not important at all (4)

10. Since receiving your diagnostic and tune-up service have you replaced the air filter for the _____ [central air conditioner/heat pump]?
 - a) Yes (54)
 - b) No (4)

Program Awareness

11. Why did you decide to participate in this program? Mark all that apply – DO NOT READ
 - a) Contractor recommended it (45)
 - b) Needed diagnostic and tune-up services for the cooling/heating system (14)
 - c) Wanted to save money (11)
 - d) Seemed like a good deal/offer from Kentucky Power (3)
 - e) Wanted to save energy

12. Was the information you received from an HVAC dealer [contractor] a crucial factor in the decision to have diagnostic and tune-up service performed at the time you did?
 - a) Yes (48)
 - b) No (9)

13. About how long did it take to receive the incentive, from the time the diagnostic and tune-up service was performed until you received the rebate? Read answer categories
 - a) Less than one month (31)
 - b) 4 to 6 weeks (16)
 - c) 6 to 8 weeks (3)
 - d) More than 8 weeks (2)
 - e) Don't know/refused (6)

Customer Satisfaction

14. Please rate your satisfaction with the following program components on a five-point scale, where "5" means "Very Satisfied" and "1" means "Very Dissatisfied." How satisfied are you with the:

	1	2	3	4	5	Don't Know	N/A
a) Contractor who performed the work			1	1	56		
b) Incentive processing time			1	8	45		4
c) Incentive offered		1		3	52		2
d) Interaction with Kentucky Program staff				2	56		

e) Response times to requests for information/assistance on forms			1	1	54		2
f) Program overall			1	1	57		

15. Would you recommend this contractor to someone else?
 a) Yes **(57)**
 b) No **(1)**
16. Why do you say that? Mark all that apply
 a) Good job done/quality work/happy/satisfied **(24)**
 b) Professional/easy to work with **(23)**
 c) Helpful/information/answered my questions/communicated with me **(7)**
 d) Fast/efficient/quick installation **(6)**
 e) Smooth/no problems **(2)**
 f) Timely/came when they said/finished on time **(1)**
 g) Good customer service overall **(5)**
 h) Have already recommended them **(26)**
 i) They are the ones who told me about the program **(1)**
 j) Don't know/refused **(1)**
17. Based on your experience, would you recommend this program to others?
 a) Yes **(57)**
 b) No
18. Why do you say that? Mark all that apply
 a) It saves electricity/we need to conserve it. **(20)**
 b) It saves money. **(33)**
 c) It's easy to do. **(11)**
 d) It's a good program. **(11)**
 e) I have recommended it. **(19)**
 f) People I recommended it to haven't been able to get into the program.
"Good rebate."
19. How could the Kentucky Power program be improved?
 a) Make it available to more people **(2)**
 b) More publicity/advertise it **(7)**
 c) Have more/better contractors on your list
 d) Faster processing of applications
 e) Explain the program/paperwork more **(1)**
 f) Better communication/easier to reach people at Kentucky Power **(2)**
 g) No suggestions/good the way it is **(46)**
 h) Don't know/refused **(3)**

Customer Demographics

Finally, I'd like to ask you a few questions for demographic purposes only.

20. Do you live in a _____ Read List
 a) Single family attached or detached building **(47)**
 b) Multifamily building with two or more units **(2)**
 c) Mobile home **(9)**
21. Do you own or rent your home?
 a) Own **(56)**
 b) Rent **(1)**

Thank you for taking the time to answer my questions!

Appendix D. Participating Small Commercial Customer Survey Guide

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's HVAC Diagnostic and Tune-Up Program. I'd like to talk with you about your impression of the program and get some feedback. This is NOT a sales effort, but for research purposes only. The survey should only take 10 minutes. All comments will remain confidential.

According to our records, you participated in the HVAC Diagnostic and Tune-Up Program. Were you involved with the decision to participate in this program or is there someone else in your business that made that decision?

Involved with/made decision 1 (CONTINUE)

Someone else decided 2 (ASK TO SPEAK TO THAT PERSON, REPEAT INTRO)

If the customer does not recall the program: "The program provides rebates to customers who receive diagnostic and tune-up service for their heating or cooling equipment."

1. How would you classify your type of business? Read answer categories

- a) Big Box
- b) Restaurant **(1)**
- c) Hotel
- d) Office **(7)**
- e) Retail **(4)**

Government

Independent Company

Rental

Church

Program Participation

2. Did you receive a tune-up and diagnostic service for your:

- a) Central air conditioner (go to Q3) **(2)**
- b) Heat Pump (go to Q4) **(3)**
- c) Both (ask Q3 & Q4) **(14)**

3. How many incentives did you receive for your air conditioner diagnostic and tune-up service?

- a) 1 **(14)**
- b) 2 **(2)**

4. How many incentives did you receive for your heat pump diagnostic and tune-up service?

- a) 1 **(10)**
- b) 2 **(4)**

5. How did you first become aware of the HVAC Diagnostic and Tune-Up Program? Indicate first mention

- a) Participating HVAC Dealer **(3)**
- b) Kentucky Power employee **(5)**
- c) KentuckyPower.com
- d) News Article
- e) Email
- f) Kentucky Power Bill Insert
- g) Word of Mouth **(2)**
- h) Community event/meeting/presentation
- i) Don't Know/refused **(6)**

American Standard

Free Ridership/Spillover

6. Prior to learning about this program, did you have specific plans to schedule a diagnostic and tune-up of your _____ [central air conditioner/heat pump]?
 - a) Yes **(2)**
 - b) No (go to Q9) **(17)**
7. Was it necessary to change your plans to qualify for the program?
 - a) Yes
 - b) No (go to Q9) **(5)**
8. What changes were made? Probe for timing and quantity/type of service
9. If you had not received the Kentucky Power incentive, how likely is it you would have had this service performed on your equipment? Read answer categories
 - a) Very likely **(4)**
 - b) Somewhat likely **(3)**
 - c) Not likely **(12)**
10. How important was the Kentucky Power incentive in your decision to have this diagnostic and tune-up service performed on your _____ [central air conditioner/heat pump]? Read answer categories
 - a) Very important **(12)**
 - b) Somewhat important **(5)**
 - c) Only slightly important **(1)**
 - d) Not important at all **(1)**
11. Since receiving your diagnostic and tune-up service have you replaced the air filter for the _____ [central air conditioner/heat pump]?
 - a) Yes **(2)**
 - b) No **(15)**
 - c) Don't know/refused **(2)**

Program Awareness

12. Why did you decide to participate in the program? Mark all that apply – DO NOT READ
 - a) Contractor recommended it **(12)**
 - b) Needed diagnostic and tune-up services for the cooling/heating system **(1)**
 - c) Wanted to save money **(7)**
 - d) Seemed like a good deal/offer from Kentucky Power **(3)**
 - e) Wanted to save energy **(1)**
 - f) Don't Know **(1)**
13. Was the information you received from an HVAC dealer [contractor] a crucial factor in the decision to have diagnostic and tune-up service performed at the time you did?
 - a) Yes **(17)**
 - b) No
 - c) Don't Know/refused **(1)**
14. About how long did it take to receive the incentive, from the time the diagnostic and tune-up services were performed until you received the rebate? Read answer categories
 - a) Less than one month **(10)**
 - b) 4 to 6 weeks **(1)**
 - c) 6 to 8 weeks
 - d) More than 8 weeks **(2)**

e) Don't know/refused **(6)**

Customer Satisfaction

15. Please rate your satisfaction with the following program components on a five-point scale, where "5" means "Very Satisfied" and "1" means "Very Dissatisfied." How satisfied are you with the:

	1	2	3	4	5	Don't Know	N/A
a) Contractor who performed the work			1	5	13		
b) Incentive processing time			1	5	11		1
c) Incentive offered			4	6	9		
d) Interaction with Kentucky Program staff		1	3	1	7		7
e) Response times to requests for information/assistance on forms		1	1	3	5		8
f) Program overall			4	7	8		

16. Would you recommend the contractor to someone else?

- a) Yes **(18)**
- b) No
- c) Don't know/refused **(1)**

17. Why do you say that? Mark all that apply

- a) Good job done/quality work/happy/satisfied **(7)**
- b) Professional/easy to work with **(5)**
- c) Helpful/information/answered my questions/communicated with me **(2)**
- d) Fast/efficient/quick installation **(4)**
- e) Smooth/no problems **(4)**
- f) Timely/came when they said/finished on time **(3)**
- g) Good customer service overall **(5)**
- h) Have already recommended them
- i) They are the ones who told me about the program **(2)**
- j) Don't know/refused **(1)**
"More reasonable with the price"

18. Based on your experience, would you recommend this program to others?

- a) Yes **(18)**
- b) No
- c) Don't know/refused **(1)**

19. Why do you say that?

- a) It saves electricity/we need to conserve it.
- b) It saves money. **(6)**
- c) It's easy to do. **(11)**
- d) It's a good program. **(12)**
- e) I have recommended it. **(1)**
- f) People I recommended it to haven't been able to get into the program.
- g) Don't know/refused **(3)**

20. How could the program be improved?

- a) Make it available to more people **(3)**
- b) More publicity/advertise it **(6)**
- c) Have more/better contractors on your list **(1)**
- d) Faster processing of applications
- e) Explain the program/paperwork more
- f) Better communication/easier to reach people at Kentucky Power **(1)**
- g) No suggestions/good the way it is **(8)**

"If it was cheaper."

"Bigger incentives."

Thank you for taking the time to answer my questions!

Appendix E. Cost-Effectiveness Analysis Inputs

Table E1: General Bencost Model KPCO Rate Inputs

BENEFIT COST TEST FOR CONSERVATION PROGRAMS -- Cost-Effectiveness Analysis			
Company:		Kentucky Power Company	
General Inputs			
Input Data			Source
Electric Retail Rate (\$/kWh) =		\$0.08599	Residential
		\$0.07402	Commercial
		\$0.08001	All Classes
Variable O&M (\$/kWh) =		\$0.00000	
	Escalation Rate =		3.00%
Environmental Damage Factor =		\$0.0097	
	Escalation Rate =		3.00%
Participant Discount Rate =		15.00%	KPCO Data Request from AEP Load Research
Utility Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
Social Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
General Input Data Year =		2011	
Project Analysis Year 1 =		2011	
Residential and Small Commercial Energy Losses		8.7%	KPCO email dated 4/20/12 from Alan Graves
Residential and Small Commercial Peak Losses		10.7%	KPCO email dated 4/20/12 from Alan Graves

TABLE E2: BENCOST MODEL COMMODITY COST INPUTS¹⁶

Year	Avoided Energy Commodity Cost (\$/kWh)	Avoided Capacity Cost (\$/kW-year)	Avoided Electric Retail Rate (\$/kWh)
2011	\$0.0395	\$40.15	\$0.080
2012	\$0.0403	\$6.01	\$0.080
2013	\$0.0399	\$10.12	\$0.082
2014	\$0.0432	\$45.99	\$0.084
2015	\$0.0447	\$124.83	\$0.086
2016	\$0.0510	\$124.83	\$0.088
2017	\$0.0520	\$69.30	\$0.090
2018	\$0.0528	\$80.15	\$0.092
2019	\$0.0540	\$89.71	\$0.094
2020	\$0.0547	\$97.91	\$0.096
2021	\$0.0561	\$104.70	\$0.098
2022	\$0.0658	\$110.03	\$0.100
2023	\$0.0670	\$113.83	\$0.103
2024	\$0.0691	\$116.04	\$0.105
2025	\$0.0707	\$118.13	\$0.108
2026	\$0.0716	\$120.25	\$0.110
2027	\$0.0731	\$122.42	\$0.113
2028	\$0.0746	\$124.62	\$0.115
2029	\$0.0761	\$126.86	\$0.118
2030	\$0.0779	\$129.15	\$0.120
2031	\$0.0788	\$130.70	\$0.123
2032	\$0.0788	\$132.26	\$0.126
2033	\$0.0788	\$133.85	\$0.129
2034	\$0.0788	\$135.46	\$0.132
2035	\$0.0788	\$137.08	\$0.135

TABLE E3: BENCOST MODEL INPUTS

General Inputs	Specific Project Inputs
Retail Rate (\$/kWh)	Utility Project Costs (\$)
Non-Electric Fuel Retail Rate (\$/Fuel Unit)	Administrative Costs (\$)
Commodity Cost (\$/kWh)	Incentive Costs (\$)
Demand Cost (\$/kW/Yr)	Total Utility Project Costs (\$)
Peak Reduction Factor (%)	Direct Participant Project Costs (\$/Participant)
Variable O&M (\$/kWh)	Participant Non-Energy Costs (Annual \$/Part)
Non-Electric Fuel Cost (\$/Fuel Unit)	Participant Non-Energy Savings (Annual \$/Part)
Non-Electric Fuel Loss Factor	Project Life (Years)
Electric Environmental Damage Factor (\$/kWh)	Avg. kWh/Participant Saved
Participant Discount Rate (%)	Avg. Non-Electric Fuel Units/Part. Saved
Utility Discount Rate (%)	Avg. Additional Non-Electric Fuel Units/Part. Saved
Societal Discount Rate (%)	Number of Participants
General Input Data Year	Total Annual kWh Saved
Project Analysis Year	Incentive/Participant
Growth and Escalation Factors (%)	

¹⁶ Avoided cost inputs provided by Kentucky Power (AEP) Load Forecasting Group through a data request.

TABLE E4: BENCOST MODEL OUTPUTS

General Outputs	Benefit-Cost Test Outputs (Per Test)
Coincident Utility Peak Demand Reduction	Net Present Value of Benefits - Costs
Annual Utility Energy Reduction	Benefit-Cost Ratio
Total Utility Demand Reduction	Total Benefits
Total Utility Energy Reduction	Total Costs
Levelized Costs per kWh	
Levelized Costs per kW	
Annual Participant Savings	
Simple Payback	



**Kentucky Power Company
Residential and Small Commercial
Load Management Pilot Program
Process and Market Evaluation · July 2012**

Submitted by

Applied Energy Group, Inc
1377 Motor Parkway, Suite 401 · Islandia, NY 11749
Tel (631) 434-1414 · Fax (631) 434-1212
www.appliedenergygroup.com

Abstract

Kentucky Power Company retained Applied Energy Group to conduct a process and market and impact evaluation of its Residential and Small Commercial Load Management Pilot Program. The program provides residential and small commercial customers with central air conditioners, heat pumps or electric water heaters a free programmable thermostat, a gateway meter, device controller, and access to an online energy management tool. During periods of high electricity demand, a wireless signal is sent to the smart meter. The smart meter signals to the device controller to turn off power to the electric water heater and/or to the programmable thermostat to increase the target temperature. There may be up to 15 scheduled events and 10 additional emergency events per year. Once the event ends, the electric water heater and thermostat temperature are restored to the scheduled customer settings.

To arrive at the final recommendations of the process and market evaluation, AEG reviewed program materials, assessed program processes and conducted interviews with Kentucky Power program staff, the third-party program implementation contractor and participating customers. The results of the analysis, along with key findings and recommendations for program improvements, are included in this report.

Table of Contents

Abbreviations	i
Definitions	ii
Executive Summary	iii
1. Introduction.....	1
2. Program Description	2
3. Evaluation Methodology	3
4. Process and Market Evaluation Findings.....	5
4.1 Program Logic Model	5
4.1.1 Activities and Outputs.....	8
4.1.2 Outcomes	11
4.1.3 External Factors.....	11
4.2 Program Performance	12
4.3 Program Marketing	17
4.3.1 Program Awareness	19
4.3.2 Motivation for Participation.....	20
4.4 Program Tracking	21
4.5 Customer Satisfaction	24
5. Key Findings and Recommendations	27
5.1 Key Program Findings.....	28
5.1.1 Program Performance Indicators	28
5.1.2 Program Awareness and Marketing Strategies.....	30
5.1.3 Program Tracking	30
5.1.4 Customer Satisfaction	31
5.2 Recommendations	31
5.2.1 Encourage Online Enrollment	31
5.2.2 Consider Program Modifications.....	31
5.2.3 Modify Marketing.....	32
Appendix A. Customer Survey.....	34

List of Tables

Table ES1 Residential Participation and Device Installation	iv
Table ES2 Residential Participation as of May 31, 2012	iv
Table 1 Participant Bill Credits	2
Table 2 Residential Budget, 2010-2012.....	3
Table 3 Residential Budget, 2010-2012.....	3
Table 4 Small Commercial Budget, 2010-2012	3
Table 5 Program Installation Goals, 2010-2012	3
Table 6 Cellular Provider Customer Counts within Kentucky Power Service Territory.....	13
Table 7 Residential Participation and Device Installation	13
Table 8 Residential Participation as of May 31, 2012	15
Table 9 2011 Cost per Participant, Budgeted and Actual	15
Table 10 2012 Cost per Participant, Budgeted and Actual	16
Table 11 Residential and Small Commercial Targeted Marketing	18
Table 12 Marketing Activities To-Date	18
Table 13 Residential Participation and Device Installation	28
Table 14 Residential Participation as of May 31, 2012	29

List of Figures

Figure 1 Program Logic Model	7
Figure 2 Residential Customer Solution Center Calls and Contract Submittals.....	14
Figure 3 Length of Time for Thermostat and Device Controller Installation (n=15).....	16
Figure 4 Initial Thermostat Programming (n=15).....	17
Figure 5 Phone Blast Text.....	19
Figure 6 Direct Mail	19
Figure 7 How Customers Heard of the Program, Enrollment Form	20
Figure 8 How Customers First Learned of the Program, Survey Response (n=15)	20
Figure 9 Customer Motivation, Enrollment Form	21
Figure 10 Customer Motivation (n=15).....	21
Figure 11 Customer Satisfaction (n=15).....	25
Figure 12 Ease of Programmable Thermostat and Device Controller Installation (n=15)	25
Figure 13 Participant Suggested Additional Training (n=15).....	26
Figure 14 How Participants Adjust Temperature Settings (n=15).....	26
Figure 15 Program Improvements (n=15).....	27

Abbreviations

AEG	Applied Energy Group, Inc.
AEP	American Electric Power
EM&V	Evaluation Measurement and Verification
DSM	Demand Side Management
HAN	Home Area Network
KPCO	Kentucky Power Company
PSC	Public Service Commission
QA/QC	Quality Assurance/Quality Control
UCMS	Utility Campaign Management System

Definitions

Demand Side Management (DSM): Programs designed to provide incentives to end-use customers or curtailment service providers to enhance the ability and opportunity for reduction of load during peak hours.

Evaluation Measurement and Verification: A set of analyses used to assess energy efficiency programs in terms of energy and demand savings and cost-effectiveness. Most energy efficiency programs are subject to some type of EM&V.

Event: Periods of high electricity demand when KPCO signals to the Smart Meter to temporarily raise the target temperature on customer thermostats and/or turn off the power connected to customer electric water heaters.

GRIDSMA[®]RT Programs: An AEP energy efficiency initiative that includes over 100 energy efficiency programs across the AEP service territory. The programs feature smart grid technologies such as smart meters, voltage optimization equipment and smart appliances that can reduce energy use.

Home Area Network (HAN): network within a home that connects digital devices. For example, the programmable thermostat communicates with the gateway meter through the HAN.

Device Controller: Device placed on the central air conditioner, heat pump or electric water heater that communicates with the HAN equipment and adjusts the settings during a load control event.

Phone Blast: Marketing technique. Pre-recorded telephone messages are issued to a designated list of customers.

Process Evaluation: A method of evaluation that uses empirical data to assess the delivery of energy efficiency programs, verify goals and determine whether the program is implemented as designed.

Program Logic Model: Graphic representation of an energy efficiency program and its processes. Logic models shows the causal relationships or linkages among the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders critical to a program's performance.

Smart Meter: Digital electric meter that is equipped with wireless communications technology that provides near real-time collection and secure transfer of customer electric usage information. The Smart Meter communicates with the customer thermostat and energy control device.

Executive Summary

Applied Energy Group, Inc ("AEG") was retained by Kentucky Power Company ("KPCO" or "Kentucky Power") to conduct process, market and impact evaluations of its Residential and Small Commercial Load Management Pilot Program. An impact evaluation was not completed at this time due to a lack of full winter and full summer season load program data to determine energy and demand savings.

The Load Management Pilot Program provides residential and small commercial customers with central air conditioners, heat pumps or electric water heaters a free programmable thermostat, a gateway meter, device controller, and access to an online energy management tool. During periods of high electricity demand, a wireless signal is sent to the smart meter. The smart meter signals to the device controller to turn off power to the electric water heater and/or to the programmable thermostat to increase the target temperature. There may be up to 15 scheduled events and 10 additional emergency events per year. Once the event ends, the electric water heater and thermostat temperature are restored to the scheduled customer settings.

AEG designed the process and market evaluation to examine program processes and customer responses to the program. The evaluation identifies methods for gathering data program results and makes recommendations for program improvements. To arrive at the final recommendations, AEG performed the following tasks:

- Reviewed program materials and data.
- Updated program logic model and assessed program flow.
- Conducted interviews with KPCO staff, the program implementer and participating customers.

Key Program Findings

The objective of the Residential and Small Commercial Load Management Pilot Program is to determine whether peak demand can be effectively reduced through the installation of device controllers on residential and small commercial central air conditioners, heat pumps and/or electric water heaters.

Program Performance Indicators

As of May 31, 2012, 35 residential customers had 73 device controllers fully installed, 39 central air conditioner/heat pump devices and 34 electric water heater devices. Sixty-one (61) residential customers signed the agreement to participate in the program, 66 percent submitted the online form, 23 percent mailed/faxed the Customer Agreement and 11 percent were Kentucky Power employees. The majority (91 percent) of the 2011 expenditures were administrative costs. The cost per device controller is decreasing, from \$10,350 in 2011 to \$1,353 through May 2012.

Table ES1 Residential Participation and Device Installation

	2011			2012 (Jan to May)		
	Actual	Goal	% of Goal	Actual	Goal	% of Goal
Load Management Devices	10	950	1.1%	63	1,000	6.3%
AC/HP	6	475	1.3%	33	500	6.6%
Water Heater	4	475	0.8%	30	500	6.0%
Participants	5			30		

Fifty-five (55) customers contacted Kentucky Power customer solution center, 12 customers mailed/faxed the Customer Agreement and 6 completed the online form. Eighteen (18) customers signed the agreement to participate in the program, 11 had a smart meter installed and 10 had HAN equipment installed. Sixty-seven (67) percent of customers did not complete the agreement to participate and did not receive follow-up.

Forty (40) customers submitted the online form, 26 had a smart meter installed and 21 had HAN equipment installed. Three (3) customers are scheduled for installation and the status of 3 customers is unclear based on the UCMS database. Seven (7) employees enrolled in the Load Management Program and 2 customers mailed/faxed the Customer Agreement but had not contacted the KPCO customer solution center.

Eleven (11) participants were disqualified and 6 withdrew from the program. Six (6) participants had the gateway meter installed prior to disqualification, requiring follow-up and replacement with standard KPCO meters. Of the 6 participants, one did not meet the National Electrical Code electric wiring standards for homes, two were elderly with health issues (one of whom did not have internet access), and three had inadequate cellular coverage.

In May 2012, Consert modified the smart meter installation procedure. Going forward, the installer would remove any smart meters with inadequate cellular coverage (i.e. not communicating with Consert's system) during the initial installation appointment.

Table ES2 Residential Participation as of May 31, 2012

	KPCO Employee	Online Form	Mailed Customer Agreement	Total
Enrolled via Customer Solution Center	0	6	12	18
Signed Participation Contract	7	40	14	61
Smart Meter Installation	7	26	11	44
HAN Installation	7	21	10	38
Installation Scheduled	0	3	2	5
Unknown	0	3	0	3

The Load Management Pilot Program was approved in October 2010 and the tariff in December 2010. Kentucky Power solicited an implementation contractor and awarded the contract to Consert in December 2010. Consert began working with KPCO staff in January 2011 to establish the program infrastructure while the contract terms were negotiated and equipment testing was being conducted. A contract was signed in July 2011. AEP conducted rigorous testing of the device controller, gateway meter and Consert technology security. AEP Dolan Laboratory approved the HAN (energy management)

equipment in April 2011 and AEP Canton Meter Laboratory approved the gateway meter, Rev. A model 200 ampere rating, in July 2011. The AEP Canton Meter Laboratory tested a new gateway meter, Rev. B model, and approved usage for the 320 ampere and 200 ampere rated meter in January 2012. Automated billing for program participants was completed in February 2012.

In November 2011, Consert issued an RFP to solicit licensed electricians to perform the equipment installations. Two installation contractors were selected, one in the northern region and one in the southern region of the KPCO service territory. The installation contractor in the southern territory elected to back out of the program in April 2012.

The load management technology can only be utilized within a network that carries the Verizon Wireless signal. The new gateway meters (Rev. B model) are capable of working with other providers and Consert's future plans include working with other providers. Approximately 65 percent of the KPCO service territory is within the Appalachian Wireless network, with the Verizon network primarily covering five counties in the southern region and the Ashland District in the north. Consert received detailed coverage data from Verizon Wireless. The Appalachian Wireless network carries the Verizon Wireless signal and reported that the system was 95 percent reliable, but did not provide detailed coverage data. In February 2012, Consert made the decision to begin installations within the Appalachian Wireless network.

The program was initially offered to KPCO employees beginning September 2011 and later to KPCO customers in the Ashland District beginning January 2012. The first employee installation occurred in September 2011 utilizing Consert certified technicians and the first external customer installation occurred in February 2012 utilizing the Consert installation contractor. The first load event occurred on February 29, 2012.

Participants have multiple avenues for program assistance, including Kentucky Power customer solution center, the installer and Consert. The KPCO program website provides Kentucky Power customer solution center contact information while the program paperwork, including the Welcome Packet and the online portal, provide Consert customer service contact information.

Program Awareness and Marketing Strategies

Kentucky Power utilizes targeted marketing to customers likely to be eligible for the program. Marketing activities included phone blasts, emails, direct mail, program brochures and the KPCO website. According to participating customers surveyed, customers most often learned of the program from KPCO direct mail. The primary reason for participating was saving money and energy.

Targeted marketing to customers within the Ashland District began in January 2012. Targeted marketing to customers in Pike, Perry and Letcher counties was anticipated to begin in April 2012 but was cancelled due to issues with Consert installation contractors.

Program Tracking

Consert manages and tracks all customer information and load event data as well as customer usage data for the HVAC equipment, water heater, programmable thermostat settings and room temperature.

An online management system, the Utility Campaign Management System ("UCMS"), is utilized to track customer information and status within the program. An online portal, the Utility Portal, is utilized to manage the load management data, including monitoring energy consumption, starting and stopping load control events and managing customer energy management accounts.

Consert provides weekly status reports summarizing the contracts received, installations scheduled, meter installs, complete installs, disqualified customers and the number of accounts in the scheduling queue. The data is manually pulled from UCMS and some inputs are estimated based on recent installation activities. Therefore, discrepancies occasionally appear in the reports. Consert anticipates automating the UCMS reports utilized to provide the weekly and monthly status reports to KPCO within the next 3 to 6 months.

Within three business days of an event, Consert provides load control event data including, but not limited to, energy and demand shed during the event, number of HVAC units and water heaters, and number of customers that opted-out. Consert will not initiate more than 15 scheduled load events, up to 150 hours, during a season. Consert anticipates incorporating load event data into the weekly status reports within the next 3 to 6 months, including the number of participants per event, number of load events, number of load event hours and the demand reduced during the event.

Consert databases and system snapshots are backed-up on a nightly basis and the system would be restored within 12 hours of any technical issue. The smart meters contain 3-days of energy usage data and customer programmable thermostat settings. However, Consert does not have the ability to restore/recreate customer programmable thermostat settings if an account is reset or cancelled. Consert plans to develop this capability by Spring 2013.

The UCMS system contains a number of reports and a database of potentially eligible KPCO customers, searchable by customer name or address. However, the UCMS reports contain varying levels of information; a few only contain customer counts with no identifiable customer information (i.e. customer name or account number). Additionally, the database may contain multiple entries for the same customer.

Customer Satisfaction

Participants are generally satisfied with the pilot program, particularly the online energy management services. However, there may be a lack of understanding on how to program the thermostat. According to the participant survey,

- 60% of program participants contacted customer service to get a better understanding of how to set/adjust the thermostat settings.
- Participants recommended the program provide additional training on how to operate the programmable thermostat, especially how to set/adjust the temperature and access the online web application.
- 87% had adjusted the temperature settings, primarily using the online portal (60%) followed by the programmable thermostat itself (33%).

Recommendations

AEG has several recommendations on how to improve the program. These include:

AEG recommends an impact evaluation commence after a full summer and winter season of load data is available to determine energy and demand savings. Data from a full year of control events must be collected before a meaningful impact evaluation can be conducted. An evaluation of the load impacts and program cost-effectiveness could be conducted in Fall 2013.

Encourage Online Enrollment

AEG recommends that KPCO modify customer enrollment options to encourage online enrollment. Participants must have internet access and be an experienced internet user to properly program the thermostat and make modifications to the thermostat settings. KPCO should limit mailed/faxed Customer Agreement applications to renters. The Customer Agreement application should be removed from the program website. Customers can be provided the KPCO customer solution center contact if there are enrollment issues or they need to be mailed/faxed a Customer Agreement.

AEG recommends that the Customer Agreements are submitted directly to Consert rather than to Kentucky Power staff. Currently, KPCO receives the applications submitted via mail or fax, and can upload the file to the UCMS customer record indicating the date the contract was received. Additionally, the Customer Agreements should consistently be uploaded to the UCMS customer record.

Consider Program Modifications

AEG recommends that Kentucky Power work with Consert to engage an installation contractor for the southern territory. The installation contractor in the southern territory elected to back out of the program in April 2012 and Consert has been unable to find another contractor located within that territory. Preferably, an installation contractor within the southern territory would conduct the installations and provide response to service calls. However, if this is not possible, the installation contractor in the northern territory is willing to conduct the installations. Consert needs to ensure that the travel will not negatively impact the program or the services provided by the installation contractor and that the contractor can provide adequate response to customer service and/or equipment maintenance calls.

AEG recommends that the Consert representative review the program with the customer when scheduling the installation appointment. In an effort to minimize disqualifications and withdrawals after the gateway meter has been installed, the representative should remind the customer that the load management equipment adjusts household temperature and the thermostat is operated via the internet.

AEG recommends that the personal energy management account log-in webpage provide Consert's customer service contact information.

AEG recommends that the installation contractor provide a basic overview of the programmable thermostat online capabilities at the time of the installation. Approximately 60 percent of survey

respondents contacted customer service, primarily to receive a better understanding of the thermostat temperature settings and how to adjust the settings. Additionally, survey respondents recommended additional training on how to operate the programmable thermostat, especially how to adjust the temperature and access the online web application.

AEG recommends that Consert improve the reporting process and automate some reporting functions, as anticipated. Manually counting the number of entries in UCMS can lead to discrepancies and it is necessary for Kentucky Power to have accurate program data. The UCMS system contains a number of reports and a database of potentially eligible KPCO customers. However, the UCMS reports contain varying levels of information; a few only contain customer counts with no identifiable customer information (i.e. customer name or account number). Additionally, the database may contain multiple entries for the same customer. The UCMS system should contain a downloadable report of all participating customers, including customer contact information (name, address and account number) as well as their status in the program. The UCMS systems should also contain a database of customers enrolled in the program, separate from the database of eligible customers. The database should list all enrolled customers and provide a link to the customer record as well as have a search function by customer name, address or account number.

Modify Marketing

AEG recommends that Kentucky Power work with Consert to modify marketing materials and activities.

1. Materials should emphasize online enrollment. For example, materials should direct customers to the Load Management Program website rather than provide the KPCO customer solution center telephone number.
2. Materials should highlight the ability for the customer to control their energy use from the internet. According to Consert, emphasizing online capabilities may attract a different type of customer to the program. For example, an experienced internet-user interested in the convenience of online temperature management.
3. Redefine marketing responsibilities. Of the 55 customers that contacted Kentucky Power customer solution center, 67 percent did not sign the agreement to participate in the program. There was no follow-up to determine why these customers did not sign the agreement.

1. Introduction

Applied Energy Group, Inc. ("AEG") was retained by Kentucky Power Company ("Kentucky Power" or "KPCO") to conduct a comprehensive evaluation of its 2010-2012 Demand Side Management ("DSM") Program Portfolio.¹ The 2010-2012 DSM Program Portfolio includes the Residential Efficient Products Program, Residential and Small Commercial HVAC Diagnostic and Tune-up Program, Commercial Incentive Program, Small Commercial High Efficiency Heat Pump and Air Conditioner Program, and the Residential and Small Commercial Load Management Pilot Program. The DSM programs will be evaluated concurrently and individual program Evaluation, Measurement and Verification ("EM&V") reports will be filed with the Kentucky Public Service Commission ("PSC") by the August 15, 2012 regulatory filing date.

Kentucky Power is an electric utility that serves approximately 175,000 customers in all or part of 20 eastern Kentucky counties.² The utility is part of the American Electric Power ("AEP") system, which is one of the largest electric utilities in the United States.³ The 2010-2012 DSM Program Portfolio was implemented to help Kentucky Power and AEP reduce electricity use and peak demand, help customers lower their electricity bills, and encourage long-term change in the market through the adoption of energy efficiency technologies and services.

The Residential and Small Commercial Load Management Pilot Program provides residential and small commercial customers with central air conditioners, heat pumps or electric water heaters a free programmable thermostat, a gateway meter, device controller, and access to an online energy management tool. During periods of high electricity demand, a wireless signal is sent to the smart meter. The smart meter signals to the device controller to turn off power to the electric water heater and/or to the programmable thermostat to increase the target temperature. There may be up to 15 scheduled events and 10 additional emergency events per year. Once the event ends, the electric water heater and thermostat temperatures are restored to the scheduled customer settings.

This report describes the key findings from the process and market evaluation and provides recommendations for improving program performance and operations. An impact evaluation was not completed at this time due to a lack of full winter and full summer season load program data to determine energy and demand savings. Data from a full year of control events must be collected before a meaningful impact evaluation can be conducted. As the first control event took place in February 2012, AEG recommends an impact evaluation commence after a full summer and winter season (Fall 2013). Section 2 provides a program description. Section 3 provides the process and market evaluation methodology and Section 4 presents the evaluation findings. Key findings and recommendations are described in Section 5.

¹ Kentucky Power's 2010-2012 DSM programs were approved in Case No. 2010-00095 and Case No. 2010-00198.

² Kentucky Power. Facts, Figures & Bios. Accessed at www.kentuckypower.com/info/facts/

³ American Electric Power delivers electricity to more than 5 million customers in 11 states and ranks among the nation's largest generators of electricity, with almost 38,000 megawatts of generating capacity in the U.S.

2. Program Description

The Residential and Small Commercial Load Management Pilot Program offers residential and small commercial customers with central air conditioners, heat pumps or electric water heaters the opportunity to participate in a pilot energy management program. Participants receive a free programmable thermostat, a gateway meter, device controller and access to an online energy management tool. A KPCO contractor installs the equipment and ensures the equipment is communicating correctly.

During periods of high electricity demand, a wireless signal is sent to the smart meter. The smart meter signals to the device controller to turn off power to the electric water heater and/or to the programmable thermostat to increase the target temperature. The target temperature of the programmable thermostat is raised no more than 4 degrees and the electric water heater may be turned off for up to 6 hours during the summer season, between the hours of 12 p.m. and 8 p.m., and 4 hours during the winter season, between the hours of 7 a.m. and 11 a.m. and 6 p.m. and 10 p.m. There may be up to 15 scheduled events and 10 additional emergency events per year. Emergency events can only occur on weekdays during the summer season between the 12 p.m. and 8 p.m. Once the event ends, the electric water heater and thermostat temperature are restored to the scheduled customer settings.

Participants must be located in an area with adequate cell service and have good credit with Kentucky Power. Customers that do not own their residence or facility must obtain the building owner's written consent. Participating customers enter into a one year agreement with Kentucky Power and are eligible for bill credits.

Table 1 Participant Bill Credits

Equipment	Season	Bill Credit
Programmable Thermostat	Summer (June – September)	\$20 (\$5 per month) per cooling unit
Electric Water Heater	Summer (June – September)	\$8 (\$1 per month) per water heater
	Winter (November – February)	

The objective of the program is to determine whether peak demand can be effectively reduced through the installation of device controllers on residential and small commercial central air conditioners, heat pumps and/or electric water heaters. Program objectives include:

- Educate customers about energy management and the benefits of energy efficiency.
- Collect actual energy and demand savings from the use of device controllers.
- Reduce peak demand, thereby lowering costs and delaying future generating requirements.
- Test the concept of such a program for consideration as a full scale offering.

The Kentucky Public Service Commission ("PSC") approved a three-year budget and installation goals for the Residential and Small Commercial Load Management Pilot Program. Tables 2 through 4 present the

residential and small commercial program budgets for 2010 through 2012. Table 5 presents the installation goals by sector.⁴

Table 2 Residential Budget, 2010-2012

	2010	2011	2012
Residential	\$149,405	\$552,775	\$579,890
Small Commercial	\$20,970	\$60,640	\$61,960
Total	\$170,375	\$613,415	\$641,850

Table 3 Residential Budget, 2010-2012

	2010	2011	2012
Incentives	\$75	\$14,000	\$28,000
Promotion	\$15,000	\$35,000	\$35,000
Equipment	\$9,300	\$176,700	\$186,000
Equipment Installation	\$3,275	\$62,225	\$65,500
Switch Maintenance	\$250	\$4,780	\$5,030
Administrative	\$115,305	\$230,610	\$230,610
Evaluation	\$6,200	\$29,460	\$29,750
Total	\$149,405	\$552,775	\$579,890

Table 4 Small Commercial Budget, 2010-2012

	2010	2011	2012
Incentives	\$30	\$1,540	\$2,800
Promotion	\$1,000	\$3,000	\$3,000
Equipment	\$4,690	\$21,105	\$21,105
Equipment Installation	\$1,320	\$5,940	\$5,940
Switch Maintenance	\$120	\$540	\$540
Administrative	\$12,810	\$25,625	\$25,625
Evaluation	\$1,000	\$2,890	\$2,950
Total	\$20,970	\$60,640	\$61,960

Table 5 Program Installation Goals, 2010-2012

	2010	2011	2012
Residential	50	950	1,000
Air Conditioner/Heat Pump	25	475	500
Water Heater	25	475	500
Small Commercial	20	90	90
Air Conditioner/Heat Pump	10	45	45
Water Heater	10	45	45
Total	70	1,040	1,090

3. Evaluation Methodology

AEG designed the evaluation to determine the efficacy of program procedures and systems, evaluate the achievement of program objectives and provide insight into and recommendations for program

⁴ Participation may not match installations because customers can have more than one device installed.

improvement. The process and market evaluation identifies whether key elements, such as incentive levels and program delivery are performing as designed and identifies issues or opportunities to improve these key elements. The goals of the evaluation are to:

- Examine key performance indicators to identify participation or program issues;
- Determine awareness levels as a way to refine marketing strategies;
- Assist program implementers and managers to structure programs and achieve cost-effective savings while maintaining high levels of customer satisfaction; and
- Provide recommendations for changing the program's structure, management, administration, design, delivery, operations or goals.

To arrive at the final recommendations, AEG carried out the following activities:

Review Program Materials

AEG reviewed current program materials, documents and processes, including the program enrollment applications and marketing and promotional materials. The review served as the basis for understanding whether the program has been implemented as planned. The review was particularly important for preparing the survey instruments for other process evaluation tasks.

Program Logic Model

AEG developed a program logic model based on the review of program materials and discussions with KPCO program staff. The model shows the linkages among the program's activities, outputs, key program stakeholders and outcomes and highlights potential external influences and program inputs.

Kentucky Power Staff Interview

AEG conducted a comprehensive group interview with Kentucky Power program staff in November 2011. The purpose of the interview was to get staff impressions of program implementation activities, program performance, marketing and opportunities for program improvements. Individual interviews with program staff were conducted between December 2011 and March 2012. Individual interviews focused on program design and delivery issues, program performance and potential areas of improvements.

Third-Party Implementer Interview

The Load Management Pilot Program is implemented by Consort. Consort duties include:

- Develop, track and administer services to achieve completion of program goals and budget.
- Provide training to Kentucky Power personnel on the program procedures.
- Review and verify application forms and customer eligibility, finalize customer agreements, and manage online customer enrollment.
- Contract and train installation contractor(s) that will install, replace, and maintain operation of all load management equipment.
- Execute load management events.
- Provide call center support, maintain a secure customer database, provide web-based portal for participant energy profile management.

- Program reporting.
- Perform QA/QC.

AEG interviewed Consort in November 2011 as well as January and June 2012. The interview provided information on implementation activities, program data and barriers to increased participation. AEG also obtained detailed information on program performance.

Participating Customer Surveys

AEG administered a 10 to 12 minute telephone survey to a sample of program participants to assess program experience and awareness, customer satisfaction and areas for potential program improvement. Kentucky Power provided data for 23 program participants that have the load management equipment fully installed. AEG calculated the sample size at a 90 percent confidence interval with an error margin of +/-10 percent. Participants were then randomly selected based on unique identifiers determined by Microsoft Excel's random number generator. Fifteen (15) customer surveys were completed (see Appendix A for the survey guide).

4. Process and Market Evaluation Findings

The evaluation identifies whether key elements, such as incentive levels and program delivery are performing as designed. When potential deficiencies in these areas arise, the evaluation identifies opportunities for improving these key elements.

4.1 Program Logic Model

Program logic models are graphic representations of an energy efficiency program and its processes. Logic models show the causal relationships between the situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (outcomes). A logic model helps identify partnerships and stakeholders critical to a program's performance.⁵

Key elements of a program logic model include:

- **Inputs.** Resources that program stakeholders contribute to a program, such as knowledge, skills, expertise, finances or equipment.
- **Outputs.** Program activities and number of people reached, based on program goals.
- **Outcomes.** Short-term, intermediate or long-term results of the program outputs. Assists evaluators and program administrators in establishing program results.
- **External Influences.** Factors outside the utility's control that may influence the program outcomes. They help to identify important program partnerships as well as the issue(s) the program can realistically influence. The factors help determine which evaluation measures will accurately reflect project outcomes or any other goals that must be met to address the problem or situation.

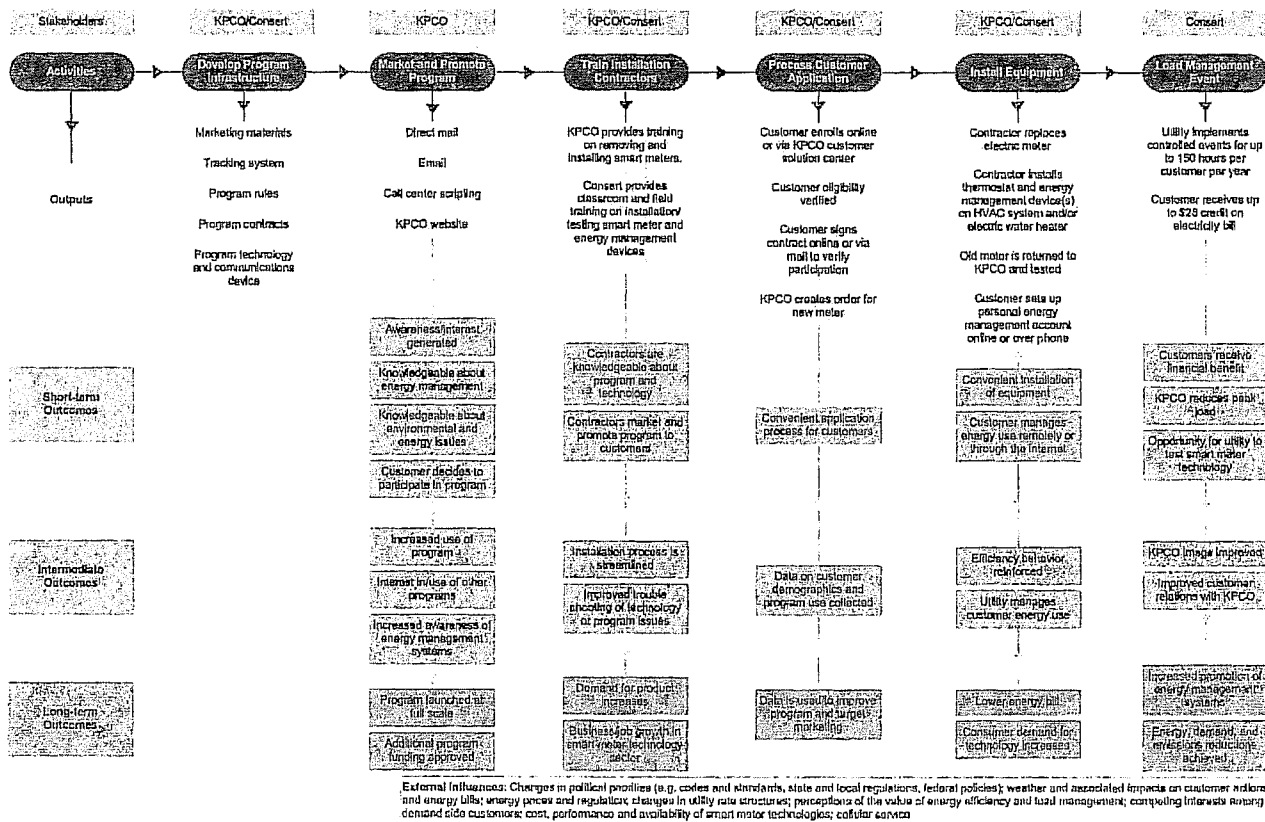
⁵ McCawley, P. (2001). *The Logic Model for Program Planning and Evaluation*. Moscow: University of Idaho Extension.

In the logic model presented in Figure 1, program activities are oriented sequentially across the top of the page from the left to the right. For example, the program's infrastructure, including its advertising materials, tracking systems, program rules, and contracts must be developed before the program can be marketed and customers recruited. Performance outputs and outcomes are oriented vertically from top to bottom. The box on the bottom right contains the external factors outside the utility's control that may affect program performance.

Kentucky Power Company's Load Management Pilot Program Evaluation | 2012

Figure 1 Program Logic Model

Inputs: program funding, PSC goals and reporting requirements, Kentucky state energy goals, Kentucky Power program staff, implementation contractor resources and expertise, evaluation contractor resources and expertise, existing awareness of Kentucky Power



4.1.1 Activities and Outputs

There are five main activities in the Residential and Small Commercial Load Management Pilot Program. The program activities and their corresponding outputs establish linkages between the situation the program is designed to address and the program's intended outcomes. Therefore, activities and outputs are discussed together.

Develop Program Infrastructure

Activities included gathering market knowledge, setting program goals, designing the program, establishing program rules, developing marketing approaches and content, establishing institutional and operating structures, and selecting the program technology and communications device. As the implementation contractor, Consert worked with Kentucky Power program staff to design the program and develop marketing materials.

Market and Promote Program

The marketing strategy for the program included targeted marketing to customers likely to have electric cooling and water heating, service for at least 12 months, low credit risk level, sufficient cellular service and non-demand meters. Marketing activities included phone blasts, emails to KPCO employees, postcards, letters, program brochures and the KPCO website.

Train Installation Contractors

Consert selected state-based installation contractors to install the load management equipment, including the gateway meter, programmable thermostat and device controller(s). Kentucky Power provided training on removal and installation of gateway meters. Consert training included four hours of classroom training and two days of hands-on field training.

Process Customer Application

A customer enrolls in the Load Management Pilot Program by completing an online form, submitting the Customer Agreement or contacting Kentucky Power's customer solution center.

The online form, available at www.kentuckypower.com/save, is a basic program contract, listing the program terms and conditions as well as the program tariff. The customer provides their contact information, KPCO electric account number and answers a few basic questions, including:

- Are you renting/leasing your home?
- What type of cooling system is installed in the home?
- Does the home have an electric water heater?
- Where did you hear about SMART Energy Management?
- If you received a mailing, what was the customer code on the mailing?
- What is the main reason for signing up for the program: save money, reduce energy usage, help the environment, help my community, free programmable thermostat, etc?

The customer provides an electronic signature agreeing to the program terms and conditions. The customer information is entered into Consert's online management system, the Utility Campaign Management System ("UCMS"). UCMS automatically screens customer applications for eligibility using

a database provided by Kentucky Power which contains customers with eligible credit rating, length of service and type of service (i.e. customer rate class).

If the customer does not own the property, they can print the online form, obtain the property owner's signature and mail the completed documents to Kentucky Power or complete the Customer Agreement. The Customer Agreement is available for download at www.kentuckypower.com/save. The customer provides their contact information, KPCO electric account number and signature, agreeing to the program terms and conditions. The agreement is submitted to Kentucky Power staff. Kentucky Power staff attaches a copy of the signed agreement to the customer record in UCMS and indicates the date the contract was received.

The customer may also enroll by contacting Kentucky Power's customer solution center at 1-85KENTUCKY (855-368-8259). A representative collects the customer's KPCO electric account number and contact information and asks a few basic questions (same as the online form). The customer information is automatically uploaded to UCMS and screened for eligibility. The representative will be notified by the system during enrollment if the customer is not eligible due to credit rating, length of service, type of service or cellular service. The representative encourages customers to sign the customer agreement online or have a Customer Agreement mailed/faxed to them. If mailed/faxed, the customer completes the paperwork and submits it to KPCO staff. Kentucky Power staff updates the customer record in UCMS to indicate the date the contract was received and may attach a copy of the signed agreement to the customer record.

Install Equipment

The KPCO Meter Revenue Operation Group (MRO) monitors UCMS for new participants and creates the meter replacement order. Kentucky Power orders the electric meters and gateway equipment (assembled at a facility in Florida) while Consert orders the HAN equipment for the device controllers. KPCO MRO monitors UCMS and tracks applicable equipment data. Customer billing credits are activated by the MRO after utility meter orders are processed and the energy management equipment (HAN) is installed. The installation contractor coordinates with KPCO MRO and Consert on equipment inventories and equipment installation.

Consert schedules the customer installation. The installation contractor installs the equipment over two visits:

- 1) Replace electric meter with a gateway meter. Replacement of the meter takes approximately 2 to 2.5 hours. The customer does not need to be present as long as the meter is located outside the home/building. The installer ensures the meter has adequate cellular service (i.e. communicating properly with Consert's system) prior to leaving. Old meters are returned to KPCO.
- 2) Install programmable thermostat and device controller(s) at least 24 hours after the gateway meter is installed to ensure the customer has adequate cellular service to the meter (the meter must communicate 98 percent of the time). Installation takes, on average, 1 to 2 hours. The

installer verifies that the HVAC system and electric water heater are operating. The customer is given the old thermostat.

After the installation is completed, the installer leaves the customer with a 'Welcome Packet.' The Welcome Packet includes:

- Welcome letter
- Answers to frequently asked questions
- Quick Start Guide with instruction on setting-up the personal online account
- Energy Management Device Quick Reference Guide
- Copy of Customer Agreement form
- Maintenance and ownership information of the thermostat and device controllers

Customers are instructed to create a personal energy management account and develop program settings for the programmable thermostat and electric water heater via the online portal or Consert customer service at 1-855-851-5271.⁶ The customer creates a personal account at kpsmartenergy.consert.com by inputting their utility account number, zip code and address number and agreeing to the terms and conditions. Once the account is created, the customer completes the 'Program Wizard,' a 13-question questionnaire to create a profile with two basic program modes: Work Day and Weekend Day. Two additional program modes, Work from Home and Vacation Energy Saver, may also be scheduled. The thermostat temperature and electric water heater adjust to coordinate with the customer profile. Customers can modify their profile anytime through the online portal or calling Consert customer service. Temporary changes can be made directly to the programmable thermostat.

Load Management Event

During periods of high electricity demand, when peak demand is anticipated to exceed 92.5 percent of the seasonal peak, a load control event is reviewed and, if approved, a wireless signal is sent to the customer's smart meter. The smart meter is a digital electric meter that is equipped with wireless two-way communication technology (also referred to as a gateway meter). The smart meter signals to the device controller to turn off power to the electric water heater and/or to the programmable thermostat to raise the target temperature. The target temperature of the programmable thermostat is raised no more than 4 degrees, depending on several factors including the temperature setting prior to the event, average indoor temperature, outdoor temperature and the length of the event. The electric water heater may be turned off for up to 6 hours during the summer season and 4 hours during the winter season between the hours of 7 a.m. and 11 a.m. and 6 p.m. and 10 p.m. There may be up to 15 scheduled events and 10 additional emergency events. Emergency events can only occur on weekdays during the summer season between the 12 p.m. and 8 p.m. Once the event ends, power to the electric water heater is restored and the thermostat setting is restored to the scheduled customer setting.

The customer can determine if an event is in progress through the online portal or the programmable thermostat. A customer may opt-out of an event through the online portal or may reset the thermostat

⁶ If a customer does not set-up a personal online account and program settings, the thermostat temperature and water heater settings are managed according to a default setting.

settings by touching the programmable thermostat display. Customers may not opt-out during emergency critical control events.

Programmable thermostat bill credits are applied during the bill periods of July through October for credits received from customer participation during June through September. Electric water heater bill credits are applied during the bill periods of July through October for credits received from June through September and during the bill periods of December through March for credits received from November through February. The amount of the customer bill credit is dependent on the equipment installed, not the load control events the customer participated in.

The installation contractor's head electrician will conduct inspections of 10 percent of completed installations every quarter. Consert will review the inspection reports and take action as necessary.

4.1.2 Outcomes

Outcomes are distinct from program outputs. Target audiences (customers) respond to the program outputs resulting in program outcomes. The outcomes are divided into short-term, intermediate, and long-term outcomes.

Short-term Outcomes

When the program is marketed and promoted, awareness and interest in energy management may increase among customers and contractors. Customers and contractors become more knowledgeable about energy management and load management technology. Customers receive a financial benefit from participating in the KPCO program. The program may lead to an increased commitment to energy management.

Intermediate Outcomes

Intermediate outcomes may include increased use of the program, interest in and use of other KPCO efficiency programs, increased promotion and awareness of energy management systems, and improved data on customer energy use.

Long-term Outcomes

The long-term outcomes may include increased customer demand for advanced and efficient technology, improved load management program, customer bill reductions, reduced utility emissions, and fewer greenhouse gases emitted. Kentucky Power may enhance its public image as a utility that responds to customer needs without sacrificing consideration of environmental issues.

4.1.3 External Factors

Documenting external factors outside the control of Kentucky Power and its stakeholders improves program planning and evaluation by identifying important program partners, the activities the program can realistically influence, which evaluation measures will accurately reflect project outcomes, and other needs that must be met. External factors include:

- Changes in political priorities (e.g. codes and standards, state and local regulations, federal policies, perceptions of energy and climate change);

- Weather and associated impacts on customer actions and energy bills;
- Energy prices and regulation;
- Changes in utility rate structures;
- Perceptions of the value of energy efficiency and load management;
- Competing interests among demand side customers;
- Cost, performance and availability of smart meter technology; and
- Cellular service.

4.2 Program Performance

The Residential and Small Commercial Load Management Pilot Program was approved in October 2010, two months later than anticipated, and the Residential and Small Commercial Load Management tariff was approved in December 2010. Kentucky Power solicited an implementation contractor and awarded the contract to Consert on December 8, 2010. Consert began working with KPCO staff in January 2011 to establish the program infrastructure while the contract terms were negotiated and equipment testing was being conducted. A contract was signed in July 2011. Automated billing for program participants was completed in February 2012.

AEP conducted rigorous testing of the device controller, gateway meter and Consert technology security.

- December 2010 – April 2011: AEP Dolan Laboratory tested and approved the device controller and HAN equipment with one antenna.
- December 2010 – July 2011: AEP Canton Laboratory tested and approved the gateway meter, Rev. A model 200 ampere rating.
- October 2011 – January 2012: Consert notified KPCO that the HAN equipment had been updated and that the version currently in stock was no longer manufactured. AEP Canton Laboratory tested and approved HAN equipment with two antennae (Rev. B model 320 ampere and 200 ampere rating), which provided additional features and reliability than the prior version.

Consert issued an RFP to solicit licensed electricians to perform the equipment installations. Two installation contractors were selected in November 2011 to perform installations in the Kentucky Power service territory, one in the northern region and one in the southern region. The installation contractor in the southern territory elected to back out of the program in April 2012.

Initially, the load management technology could only be utilized within a network that carried the Verizon Wireless signal. The new gateway meters (Rev. B model) are capable of working with other providers. The KPCO service territory is primarily within the Appalachian Wireless cellular network, with the Verizon network covering five counties in the southern region and the Ashland District in the north (see Table 6). Consert received detailed coverage data from Verizon Wireless. The Appalachian Wireless network carries the Verizon Wireless signal and reported that the system was 95 percent reliable, but did not provide detailed coverage data. In February 2012, Consert made the decision to begin installations within the Appalachian Wireless network.

Table 6 Cellular Provider Customer Counts within Kentucky Power Service Territory⁷

Cellular Provider	Residential Customers		Commercial Customers	
	Count	Percentage	Count	Percentage
Verizon Wireless	6,273	34%	114	36%
Appalachian Wireless	12,052	66%	203	64%
Total	18,325	100%	317	100%

The program was offered to KPCO employees beginning September 2011 and to KPCO customers in the Ashland District beginning January 2012. The first employee installation occurred in September 2011 utilizing Consort certified technicians and the first customer installation occurred in February 2012 utilizing the installation contractor. The first load event occurred on February 29, 2012.

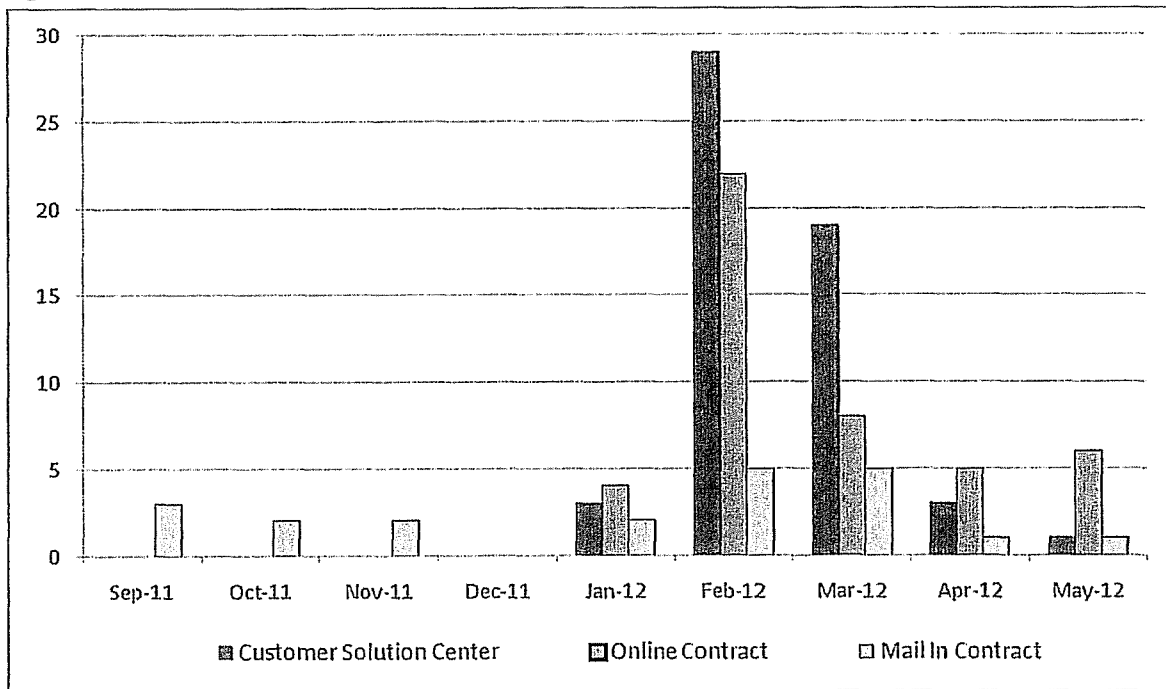
As of May 31, 2012, 35 residential customers had 73 device controllers fully installed, 39 central air conditioner/heat pump devices and 34 electric water heater devices. Five (5) customers had 10 devices installed in 2011, achieving 1.1 percent of the annual installation goal. Thirty (30) residential customers had 63 devices installed through May 2012, achieving 12.6 percent of the annual installation goal.

Table 7 Residential Participation and Device Installation

	2011			2012 (Jan to May)		
	Actual	Goal	% of Goal	Actual	Goal	% of Goal
Load Management Devices	10	950	1.1%	63	1,000	6.3%
AC/HP	6	475	1.3%	33	500	6.6%
Water Heater	4	475	0.8%	30	500	6.0%
Participants	5			30		

⁷ Customer counts include tariff codes 22 and 17.

Figure 2 Residential Customer Solution Center Calls and Contract Submittals



Sixty-one (61) residential customers signed the agreement to participate in the program, 66 percent submitted the online form, 23 percent mailed/faxed the Customer Agreement and 11 percent were Kentucky Power employees.

Fifty-five (55) customers contacted Kentucky Power customer solution center, 12 customers mailed/faxed the Customer Agreement and 6 completed the online form. Eighteen (18) customers signed the agreement to participate in the program, 11 had a smart meter installed and 10 had HAN equipment installed.

- 2 participants withdrew from the program, 1 had a smart meter and HAN equipment installed.
- 2 customers are scheduled for installation.
- 67% of customers did not sign the agreement to participate and did not receive follow-up.

Forty (40) customers submitted the online form, 26 had a smart meter installed and 21 had HAN equipment installed. Three (3) customers are scheduled for installation and the status of 3 customers is unclear based on the UCMS database.

- 9 customers were disqualified; four had a smart meter installed.
- 4 participants withdrew from the program, 1 had a smart meter installed.

Seven (7) employees enrolled in the Load Management Program, one of whom was disqualified after the smart meter and HAN equipment were installed. Two (2) customers mailed/faxed the Customer Agreement but had not contacted the KPCO customer solution center, one of whom was disqualified after the smart meter was installed.

Eleven (11) participants were disqualified due to inadequate cellular coverage (27%), low credit rating with Kentucky Power (18%), issues with HVAC equipment or electric wiring (36%), not being able to access the customer's electric meter (9%) or not having a KPCO electric service at least 12 months (9%). Six (6) customers withdrew from the program, 4 prior to having the smart meter installed. Six (6) participants had the gateway meter installed prior to disqualification/withdrawal from the program, requiring follow-up and replacement with standard KPCO meters. Of the 6 participants,

- 3 participants had inadequate cellular coverage. In May 2012, Consert modified the smart meter installation procedure such that the installer would remove any smart meters with inadequate cellular coverage (i.e. not communicating with Consert's system) during the initial installation appointment.
- 1 participant did not meet National Electrical Code electric wiring standards for homes.
- 2 participants were elderly with health issues and chose not to participate after fully understanding the program, 1 of whom did not have internet access.

Table 8 Residential Participation as of May 31, 2012

	KPCO Employee	Online Form	Mailed Customer Agreement	Total
Enrolled via Customer Solution Center	0	6	12	18
Signed Participation Contract	7	40	14	61
Smart Meter Installation	7	26	11	44
HAN Installation	7	21	10	38
Installation Scheduled	0	3	2	5
Unknown	0	3	0	3

The majority of the 2011 expenditures were administrative costs (91 percent). In 2011, residential expenditures accounted for 19 percent of the budget and the small commercial expenditures accounted for 24 percent of the budget. The 2012 expenditures through May 31st accounted for 14 percent of the annual residential budget and 17 percent of the small commercial budget. The 2012 cost per device controller (through May) decreased significantly from the 2011 cost per device controller (\$1,353 versus \$10,350).

Table 9 2011 Cost per Participant, Budgeted and Actual

	Residential		Small Commercial	
	Budgeted	Actual	Budgeted	Actual
Incentives	\$14,000	\$0	\$1,540	\$0
Promotion	\$35,000	\$0	\$3,000	\$0
Equipment	\$176,700	\$205	\$21,105	\$0
Equipment Installation	\$62,225	\$0	\$5,940	\$0
Switch Maintenance	\$4,780	\$0	\$540	\$0
Administrative	\$230,610	\$94,500	\$25,625	\$10,500
Evaluation	\$29,460	\$8,793	\$2,890	\$3,815
Total Cost (\$)	\$552,775	\$103,498	\$60,640	\$14,315
Load Management Devices	950	10	90	0
Cost (\$) per Device	\$582	\$10,350	\$674	-

Table 10 2012 Cost per Participant, Budgeted and Actual

	Residential		Small Commercial	
	Budgeted	Actual (Jan to May)	Budgeted	Actual (Jan to May)
Incentives	\$28,000	\$18	\$2,800	\$0
Promotion	\$35,000	\$12,141	\$3,000	\$229
Equipment	\$186,000	\$4,710	\$21,105	\$0
Equipment Installation	\$65,500	\$1,725	\$5,940	\$0
Switch Maintenance	\$5,030	\$259	\$540	\$0
Administrative	\$230,610	\$54,000	\$25,625	\$6,000
Evaluation	\$29,750	\$11,697	\$2,950	\$5,398
Other	\$0	\$669	\$0	\$0
Total Cost (\$)	\$579,890	\$85,219	\$61,960	\$11,626
Load Management Devices	1,000	63	90	0
Cost (\$) per Device	\$580	\$1,353	\$688	-

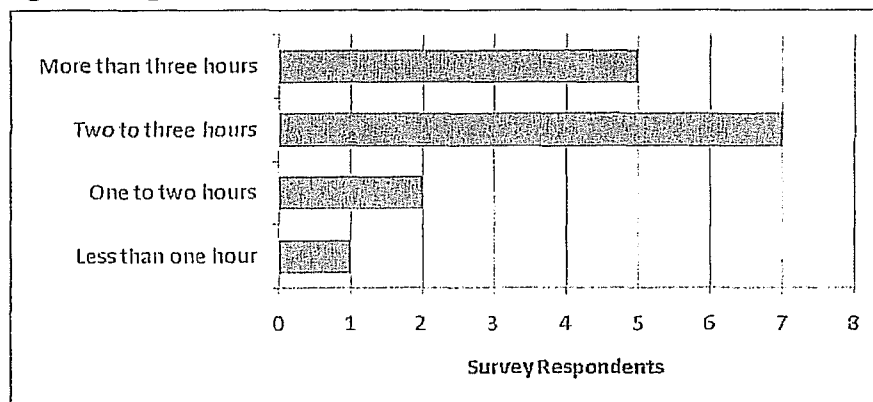
Consert and the installation contractor conducted quality assurance/quality control checks in April 2011. Seventeen (17) of the 18 homes with complete installations were visited. Proper installation was confirmed at all locations.

Ninety-four (94) customers either contacted the Kentucky Power customer solution center and/or submitted the online form. These customers were asked a few basic questions, including whether they rent/own, the type of cooling system, and whether they have an electric water heater. Based on the customer responses,

- 85 percent are homeowners and 15 percent are renters.
- 87 percent have central heating and cooling systems, 12 percent have only central cooling systems and 1 percent did not have either.
- 98 percent have electric water heaters.

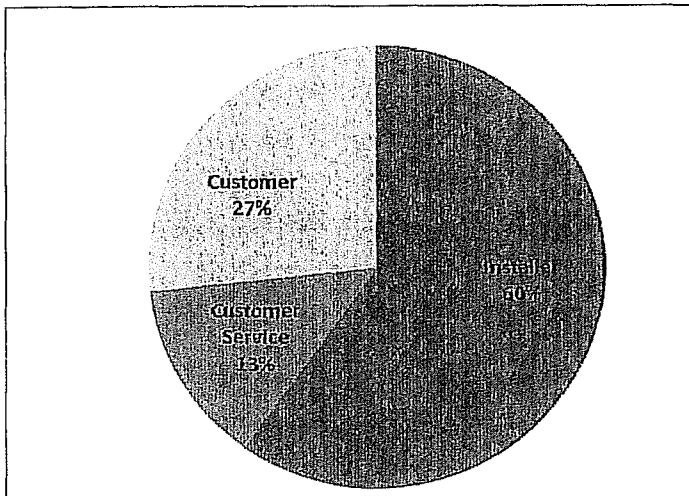
Programmable thermostat and device controller installation generally took between two and three hours. However, nearly a third of survey respondents reported that the process took more than three hours and one in five reported that the installation took two hours or less.

Figure 3 Length of Time for Thermostat and Device Controller Installation (n-15)



The installer initially programmed 60 percent of the programmable thermostats, based on the participant survey. Customer's programmed 27 percent themselves and 13 percent contacted customer service for assistance with the initial programming.

Figure 4 Initial Thermostat Programming (n=15)



Kentucky Power offers multiple bill payment methods to electric customers. As a measure of internet usage for everyday activities, the participant survey asked the how customers paid their electric bills. Fifty-three (53) percent of customers pay their bill online and 20 percent have automatic withdrawal.

4.3 Program Marketing

The Residential and Small Commercial Load Management Program is marketed under Kentucky Power's GRIDSSMMART[®] Programs. Kentucky Power utilizes targeted marketing to customers that are likely to have electric cooling and water heating, service for at least 12 months, low credit risk level, sufficient cellular service and non-demand meters.

In 2011 and 2012, marketing activities included:

- **Direct Mail.** Direct mailers, including letters, postcards, bill inserts and self mailers, were distributed to targeted residential and small commercial customers in the Ashland District in January, February, March and May of 2012.
- **KPCO Employee Communications.** Posters and email blasts were utilized to help KPCO employees become more familiar with the DSM Programs. KPCO employees were encouraged to enroll in the pilot program and to promote programs in the local community.
- **Phone Blast.** In February 2012, Kentucky Power utilized phone blasts to follow-up direct mail distributed in January and February 2012.
- **Internet.** Kentucky Power marketed the program online through the KPCO SMART Programs website at kentuckypower.com/save
- **Customer Service.** The KPCO Customer Services Group provides program information to eligible customers.

Based on customer information from KPCO and cellular service coverage from Consert, 18,325 residential and 317 small commercial customers have been identified. The customers and Kentucky Power employees classified as 'good coverage' are within Ashland District and 'Unknown' are within the Appalachian Wireless network. Kentucky Power focused on 'good coverage' customers and employees initially. Marketing activities planned for 'moderate coverage' and 'unknown coverage' customers in Pike, Perry and Letcher counties in April and May were cancelled due to the lack of an installation contractor in the southern territory.

Table 11 Residential and Small Commercial Targeted Marketing

Cellular Coverage	Residential Customers	Commercial Customers
KPCO Employee		
Good Coverage	96	
Moderate Coverage	17	
Poor Coverage	9	
No Coverage	7	
Unknown	100	
Customers		
Good Coverage	3,476	90
Moderate Coverage	971	12
Poor Coverage	1,084	
No Coverage	613	12
Unknown	11,952	203
Total	18,325	317

Table 12 Marketing Activities To-Date

Date	Activity	Audience	Quantity
9/9/11	Email	KPCO Employees	340
10/6/11	Email	KPCO Employees	340
1/17/12	Self Mailer	Residential	501
1/31/12	Self Mailer	Residential	502
2/7/12	Self Mailer	Residential	3455
2/24/12	Phone blast	Residential	3351
3/9/12	Self Mailer	Small Commercial	77
3/16/12	Letter	Residential	3,455
5/30/12	Self Mailer	Residential	1065
5/30/12	Self Mailer	Small Commercial	228

Figure 5 Phone Blast Text

Hello. This is a message from Kentucky Power. Again, this message is from Kentucky Power.

Kentucky Power is offering a pilot program for customers who have central electric cooling systems and electric water heaters. It's called SMART Energy Management, and it can help lower your electricity bills. When you sign up, you'll receive a free, programmable, communicating thermostat professionally installed at no charge. Plus you can receive up to a total of \$28 in credits on your electricity bills each year.

There's more. With SMART Energy Management, you can view your daily electricity use online... and, if you have a smart phone, you can remotely adjust your thermostat settings when you are on the go.

So sign up today. To learn more, visit kentuckypower.com/go/smartenergy or call 1-855-368-8259. Again, that's kentuckypower.com/go/smartenergy or call 1-855-368-8259.

Thank you.

Figure 6 Direct Mail

Lower your electricity bills year-round.


As part of our gridSMART™ initiative, Kentucky Power is offering SMART Energy Management™ - a new air conditioning (AC) and electric water heater energy management program. This program is a benefit to customers who have central electric cooling systems or electric heat pumps as well as electric water heaters. It is designed to help lower your electricity bill, conserve electricity and cut energy consumption and emissions.

Sign up for SMART Energy Management™ and you'll receive:


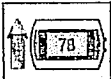

- A free programmable communicating thermostat installed by a licensed contractor
- Energy management devices for your electric water heater and cooling system, installed free-of-charge.
- Up to \$28 in bill credits by allowing your programmable thermostat to be automatically adjusted and your electric water heater to be turned off during periods of high electricity demand.*
- Access to our web-based energy management software so you can conveniently change or program your thermostat's temperature settings and view your daily energy use. Mobile users? You can monitor and remotely adjust the thermostat settings and operation of your water heater when you are on the go.

Enroll online today!

kentuckypower.com/go/smartenergy
 Or call toll free 1-855-KENTUCKY (1-855-368-8259)
 Customer Code SEM10



How SMART Energy Management™ works

- The call by electricity is high and there's a need to reduce demand on the power grid.
- And this signal is sent from Kentucky Power to your thermostat. Your Smart Meter communicates with your thermostat and the energy management control device.
- Your thermostat will be automatically adjusted and your water heater will be turned off. These adjustments, which we also referred to as "events," may occur up to 16 different times throughout the year.*
- The temperature setting on your thermostat will be raised to save time & energy.

2. The temperature setting on your thermostat is adjusted and your water heater is turned off.

3. During an event your thermostat will display a red light indicating an event is in progress.

4. Events can last no more than 16 hours and may occur during the months of June through September between the hours of 8am and 8 pm.

5. Your water heater will be turned off for no more than 4 hours during the months of June through September between the hours of 8am and 8 pm. It may also be turned off no more than four hours during the months of November through February between the hours of 7 am - 11 am, and 6 pm - 10 pm.

Receive credits on your monthly electric bills

Receive \$28 in bill credits during the summer months by allowing your thermostat to be automatically adjusted (\$5 per month from June through September).

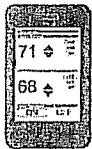
You can also receive \$5 in bill credits by allowing your water heater to be turned off (\$1 monthly bill credit) during the months of June through September and November through February.

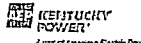
Program your thermostat online.

As a participant of SMART Energy Management, you can go online to program and adjust the temperature settings on your thermostat - from anywhere, at any time. You'll also learn how much electricity you save by hour and day by day, so you can see how your energy-efficient actions save money and energy.


Have a smart phone?

Our online tool accepts mobile device, and other mobile devices so you can remotely adjust the temperature settings on your thermostat when you are on the go.





A part of American Electric Power



from Kentucky Power

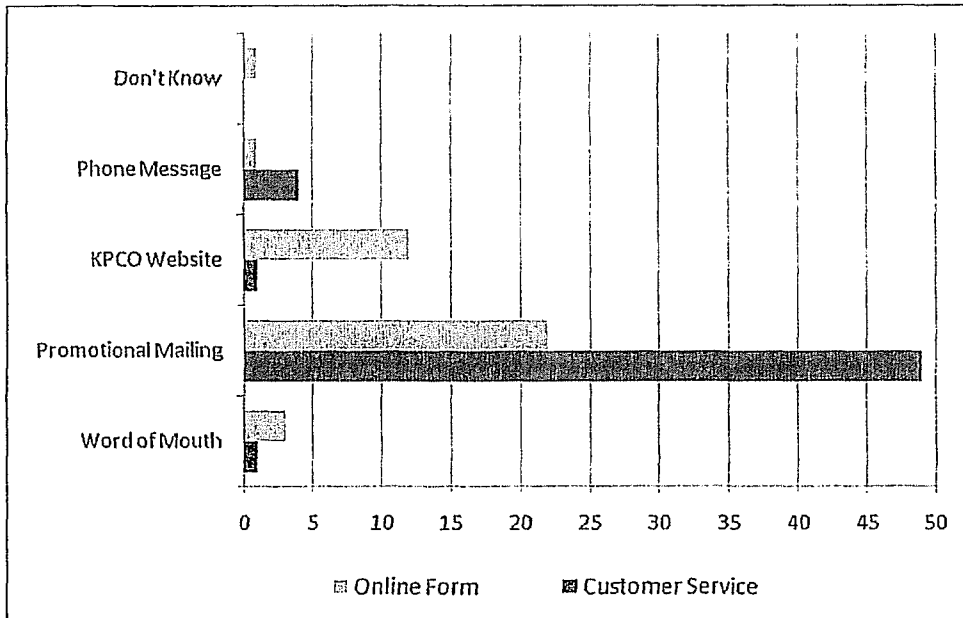
Why SMART Energy Management™?

When the call for electricity is high, there is a need to reduce demand on the power grid. SMART Energy Management can help ease an electricity during high demand periods throughout the year, while also reducing emissions.

4.3.1 Program Awareness

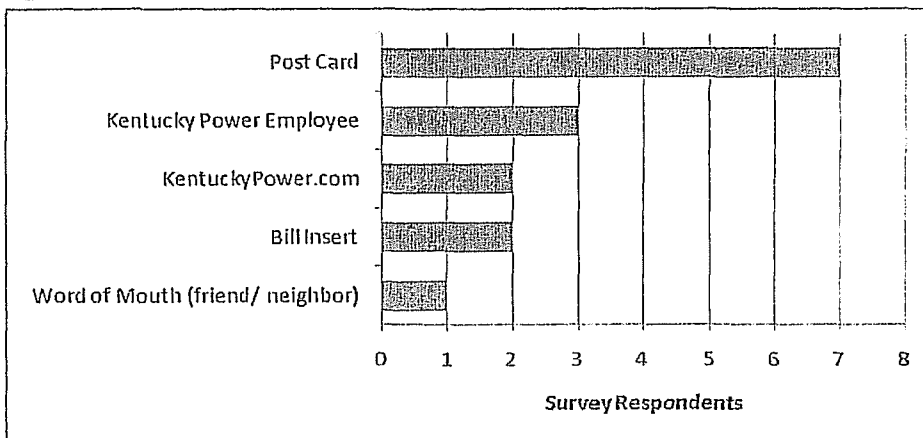
Of the customers that contacted the Kentucky Power customer solution center and/or submitted the online form, the majority had heard of the program from a promotional mailing, followed by the KPCCO website (Figure 7).

Figure 7 How Customers Heard of the Program, Enrollment Form



According to survey respondents, customers most often learned of the program from KPCO direct mail. Forty-seven (47) percent of customers learned of the program from a post card and 13 percent from a bill insert. KPCO employees and customer referral also raised awareness about the program.

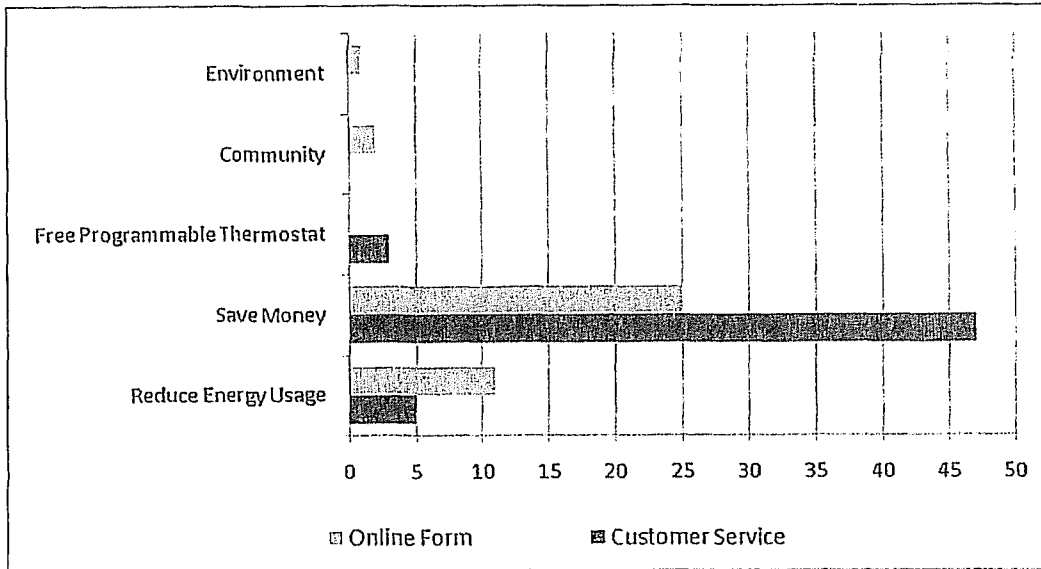
Figure 8 How Customers First Learned of the Program, Survey Response (n=15)



4.3.2 Motivation for Participation

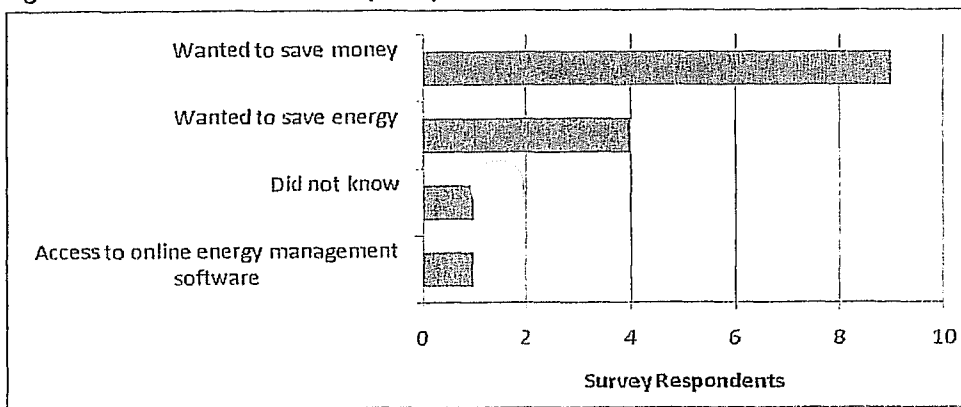
Of the customers that contacted the Kentucky Power customer solution center and/or submitted the online form, the majority noted that the main reason for enrolling in the program was to save money, followed by reducing energy usage (Figure 9). Consert would like to modify the marketing to stress the ability for the customer to control their energy use from the internet rather than the potential bill savings, as they believe that it would attract a different type of customer to the program.

Figure 9 Customer Motivation, Enrollment Form



Participating customers surveyed cited that the primary reason for participating in the Load Management Pilot Program was saving money (60 percent) and energy (27 percent).

Figure 10 Customer Motivation (n=15)



4.4 Program Tracking

Kentucky Power submits bi-annual reports to the Kentucky PSC with program progress to-date, including participation, estimated energy and demand savings, and budget. The utility reviews actual, projected and summary program data with the DSM Collaborative on a quarterly basis. Consert manages and tracks all customer information and load event data as well as customer usage data for the HVAC equipment, water heater, programmable thermostat settings and room temperature. An online management system, the Utility Campaign Management System ("UCMS"), is utilized to track customer information and status within the program. An online portal, the Utility Portal, is utilized to manage the load management data, including monitoring energy consumption, starting and stopping load control events and managing customer energy management accounts.

Consert provides weekly status reports summarizing the contracts received, installations scheduled, meter installs, complete installs, disqualified customers and the number of accounts in the scheduling queue. The data is manually pulled from UCMS and some inputs are estimated based on recent installation activities. Therefore, discrepancies occasionally appear in the reports. Consert anticipates automating the UCMS reports utilized to provide the weekly and monthly status reports to KPCO within the next 3 to 6 months.

Within three business days of an event, Consert provides load control event data including:

- Start and end date and time of event.
- Available load when event began.
- Energy and demand shed during event (individual and total).
- Number of customers that opted-out of the event and the time of opt-out.
- Number of HVAC units and water heaters (individual and total).
- Energy usage per device on 15-minute intervals (individual and total).

Consert will not initiate more than 15 scheduled load events, up to 150 hours, during a season. Consert anticipates incorporating load event data into the weekly status reports within the next 3 to 6 months, including the number of participants per event, number of load events, number of load event hours and the demand reduced during the event.

Consert databases and system snapshots are backed-up on a nightly basis and the system would be restored within 12 hours of any technical issue. The smart meters contain 3-days of energy usage data and customer programmable thermostat settings. However, Consert does not have the ability to restore/recreate customer programmable thermostat settings if an account is reset or cancelled. Consert plans to develop this capability by Spring 2013.

Customer enrollment and agreement information is entered into UCMS.

- The online enrollment form is entered directly into UCMS.
- KPCO customer solution center enters the customer information directly into UCMS utilizing a KPCO web-interface.
- Kentucky Power manually indicates on the customer record in UCMS the date the contract was received and may attach a copy of the signed agreement.

UCMS automatically screens the online form and KPCO customer solution center enrollments for eligibility utilizing a database created by Consert. Kentucky Power provided a database of customers with eligible credit rating, length of service and type of service (i.e. customer rate class). Consert added cellular service availability to the KPCO database. The KPCO eligibility of mailed/faxed Customer Agreements is verified when Kentucky Power staff updates the customer records in UCMS (as the database contains only KPCO eligible customers). Consert manually screens these participants for cellular service availability.

The customer is determined to be eligible or pending action. Consert reviews pending records to verify that the customer is eligible or ineligible. Eligible records are listed in outbound scheduling and Consert schedules installation appointments. The UCMS system contains a number of reports and a database of potentially eligible KPCO customers, searchable by customer name or address. The UCMS reports contain varying levels of information; a few only contain customer counts with no identifiable customer information (i.e. customer name or account number). The reports include:

- Completed online forms and Customer Agreements by enrollment date.
- Customers that need to be scheduled for installation.
- Scheduled installation appointments.
- Work orders for gateway meter and HAN equipment installations.
- Customers that are in the queue and need to receive a meter.
- Completed installations.
- *Disqualified customers.*
- Customers that withdrew from the program.
- Trouble tickets, detailing the customer issue and ticket issue and close dates.
- KPCO customer solution center customer records.

Consert anticipates automating these reports within the next 3 to 6 months. The UCMS system also contains a database of potentially eligible KPCO customers, searchable by customer name or address. The database may contain multiple entries for the same customer. The customer records in the searchable database track:

- Name, address, contact information and account number
- Status of contract
- Record of program history, including the date the contract was received, the date the customer was screened by UCMS, the date(s) and time(s) the customer was called or emailed to schedule the installation, the installation date (whether the installation was completed, cancelled, withdrawn, etc), the reason for disqualification, the Consert/KPCO contact.
- A copy of the customer agreement.
- Equipment information, including existing and new meter serial number, manufacturer meter reading, meter seal number and pictures of existing and new meter as well as the device controller serial numbers and locations in the home.

During the customer enrollment process, the following information is collected:

- Customer name, address, KPCO electric account number, telephone number, email address
- Residence information:
 - Rent or own residence
 - Type of cooling system installed
 - Is there an electric water heater
- Awareness:
 - How did they hear of the program

- o Type of mailing received
- o Main reason the customer is signing up for the program

The KPCO Meter Revenue Operation Group tracks the meters removed and replaced from customer homes/businesses using a two-step process. When both steps are completed by the installation contractor, the customer is considered a program participant and can receive *bill credits*.

1. KPCO receives the change meter order for the gateway meter.
2. The installation contractor installs the HAN device controller equipment.

AEP Customer Support notifies *Consert* via email and by the Customer Communication System when to schedule a load event. The Utility Portal is utilized to monitor energy consumption, schedule and monitor load events as well as manage customer energy management accounts. Utility Portal data includes, but is not limited to:

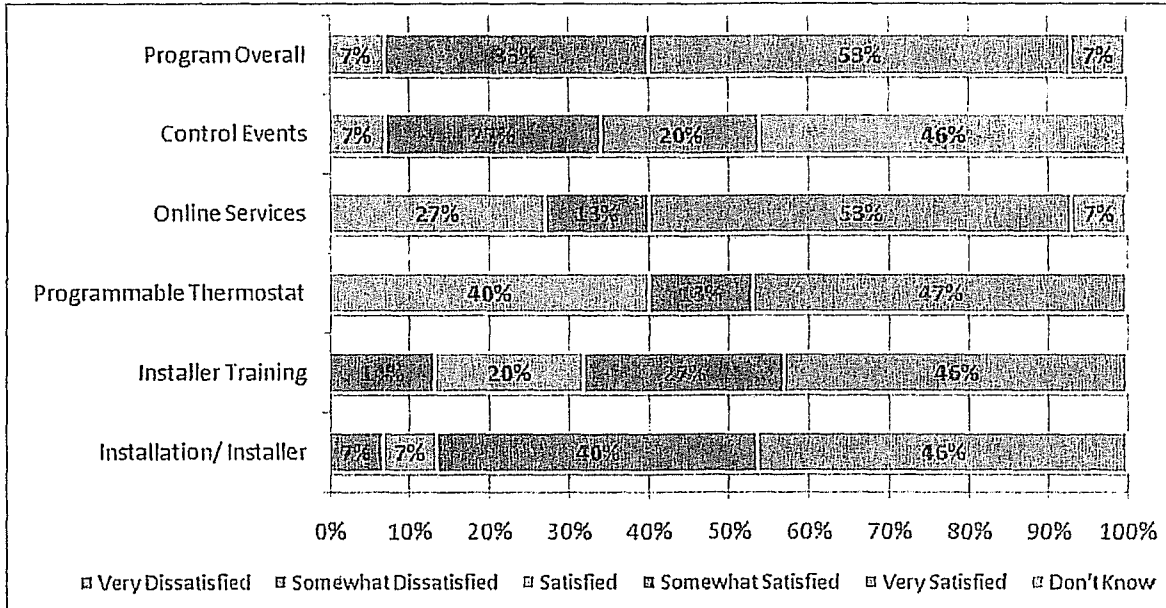
- o **Energy Consumption:** Real-time participant usage and available load by program and device controller.
- o **Manage Customer Energy Management Accounts:** Participant information such as account number, contact information, equipment information, meter reading and status of the meter. *Consert* customer service representatives can assist customers with their energy management account and reset customer passwords.
- o **Schedule Load Events:** Load events can be established up to two weeks in advance.
- o **Monitor Load Events:** Information available for events *in-progress, upcoming and past*. Summary statistics and account-specific statistics are provided for *in-progress* and *past* events. A graphic presents total participant consumption for 4-hours prior the event and real-time (updates every 5 minutes throughout the event). A summary graphic and detailed log of accounts presents participant status during the event, from *in-progress* to *opted-out*.

Kentucky Power had difficulty viewing the graphics available through the Utility Portal because the *Consert* portal is supported on the most up-to date Internet Explorer and Adobe Flash systems. *Consert* addresses compatibility issues as new version are rolled-out every six months. The Kentucky Power viewing issues were resolved.

4.5 Customer Satisfaction

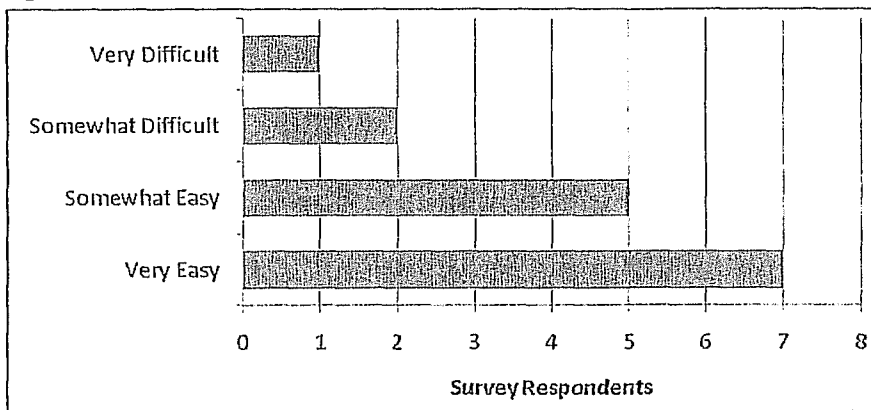
Overall, participants were satisfied with the Load Management Pilot Program, particularly the online services. Ninety-three (93) percent of customers surveyed would recommend the program. Based on the participant survey, the areas that could use the most improvement include the programmable thermostat and the installer training.

Figure 11 Customer Satisfaction (n=15)



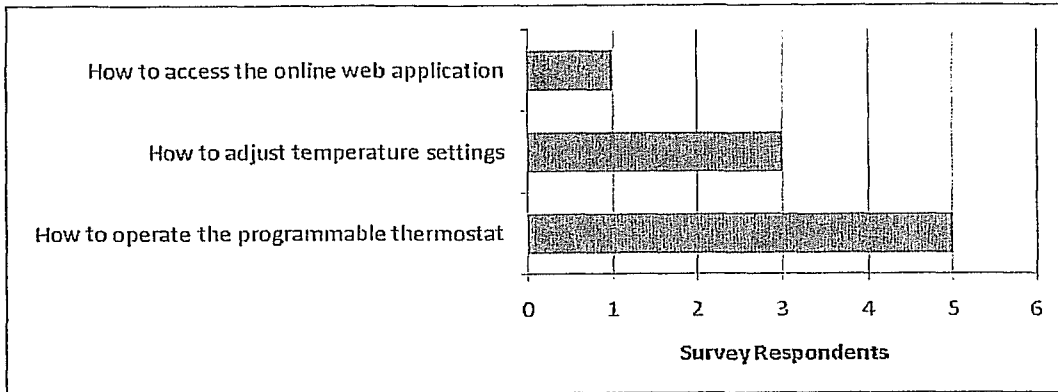
Nearly half (47 percent) of survey respondents noted that the process of having the programmable thermostat and device controller installed was very easy. One customer noted that the installer did not show up for several appointments.

Figure 12 Ease of Programmable Thermostat and Device Controller Installation (n=15)



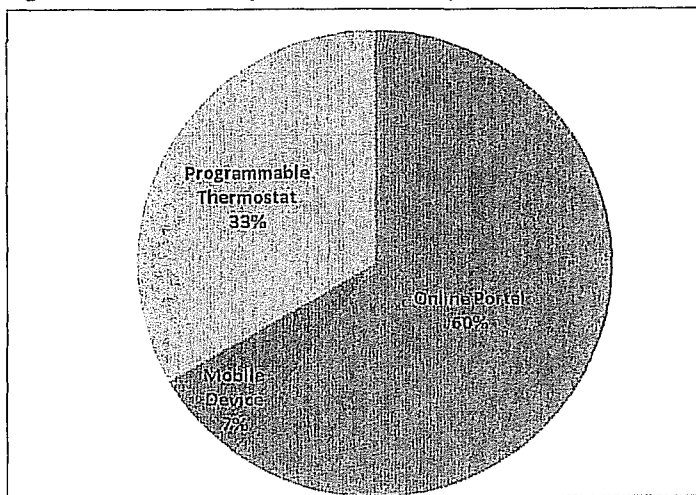
According to survey results, program participants were generally quite satisfied with the installer. In general, the installer was neat and courteous (93 percent), flexible about scheduling the installation appointment (86 percent) and on-time for the appointment (80 percent). Fifty-three (53) percent of survey respondents felt the installer provided adequate training on how to operate the programmable thermostat. Participants recommended additional training on how to operate the programmable thermostat, especially how to adjust the temperature and access the online web application.

Figure 13 Participant Suggested Additional Training (n=15)



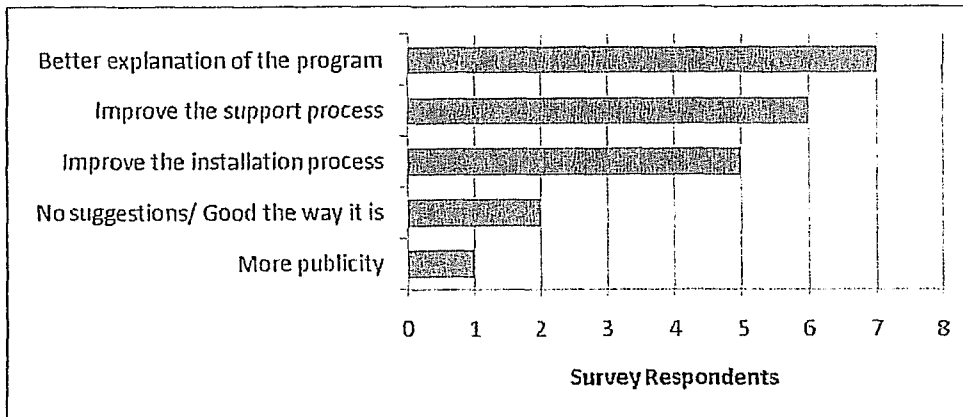
Eighty (80) percent of survey respondents found the thermostat easy to use and 87 percent had experience adjusting the temperature settings. Participants most often adjust the thermostat settings utilizing the online customer portal (60%), followed by the programmable thermostat itself (33%). One participant reported using a mobile device to make adjustments.

Figure 14 How Participants Adjust Temperature Settings (n=15)



Suggested program improvements were primarily, better explanation of program (33%), improvement of the support process (29%) and improvement of the installation process (24%). Participants surveyed noted that the installer needs better training and that the online applications could be improved.

Figure 15 Program Improvements (n=15)



Many respondents (60 percent) contacted customer service and/or the installation contractor, primarily to receive a better understanding of the thermostat temperature settings and how to adjust the settings. Two customer service issues that arose in recent weeks are summarized below. The first concerns an elderly customer without internet access that had load management equipment installed.

A neighbor was helping the customer, who was elderly and did not have a computer or internet access, manage the system. Two days after the installation was completed, Consert customer service received a call from the customer's neighbor. Consert assisted the neighbor in setting the thermostat for the home. However, three days later the neighbor contacted customer service requesting that the customer be removed from the program as they were having difficulty operating the thermostat. Consert removed the customer from the program and removed the load management equipment the following day.

A second customer service issue concerned the deletion of a customer program account due a Consert system error.

The customer had to notify Consert that the account had been deleted. The customer had difficulty finding the customer service contact information as it was not available unless the customer was logged into the online portal. The customer service representative reset the account, but the customer's program settings were not saved and the customer had to reprogram the thermostat settings. The customer displayed concern that Consert did not notify them of the account issue and that there was not a back-up of the thermostat settings or energy usage history.

5. Key Findings and Recommendations

The objective of the Residential and Small Commercial Load Management Pilot Program is to determine whether peak demand can be effectively reduced through the installation of device controllers on residential and small commercial central air conditioners, heat pumps and/or electric water heaters.

5.1 Key Program Findings

The objective of the Residential and Small Commercial Load Management Pilot Program is to determine whether peak demand can be effectively reduced through the installation of device controllers on residential and small commercial central air conditioners, heat pumps and/or electric water heaters.

5.1.1 Program Performance Indicators

As of May 31, 2012, 35 residential customers had 73 device controllers fully installed, 39 central air conditioner/heat pump devices and 34 electric water heater devices. Sixty-one (61) residential customers signed the agreement to participate in the program, 66 percent submitted the online form, 23 percent mailed/faxed the Customer Agreement and 11 percent were Kentucky Power employees. The majority (91 percent) of the 2011 expenditures were administrative costs. The cost per device controller is decreasing, from \$10,350 in 2011 to \$1,353 through May 2012.

Table 13 Residential Participation and Device Installation

	2011			2012 (Jan to May)		
	Actual	Goal	% of Goal	Actual	Goal	% of Goal
Load Management Devices	10	950	1.1%	63	1,000	6.3%
AC/HP	6	475	1.3%	33	500	6.6%
Water Heater	4	475	0.8%	30	500	6.0%
Participants	5			30		

Fifty-five (55) customers contacted Kentucky Power customer solution center, 12 customers mailed/faxed the Customer Agreement and 6 completed the online form. Eighteen (18) customers signed the agreement to participate in the program, 11 had a smart meter installed and 10 had HAN equipment installed. Sixty-seven (67) percent of customers did not complete the agreement to participate and did not receive follow-up.

Forty (40) customers submitted the online form, 26 had a smart meter installed and 21 had HAN equipment installed. Three (3) customers are scheduled for installation and the status of 3 customers is unclear based on the UCMS database. Seven (7) employees enrolled in the Load Management Program and 2 customers mailed/faxed the Customer Agreement but had not contacted the KPCO customer solution center.

Eleven (11) participants were disqualified and 6 withdrew from the program. Six (6) participants had the gateway meter installed prior to disqualification, requiring follow-up and replacement with standard KPCO meters. Of the 6 participants, one did not meet the National Electrical Code electric wiring standards for homes, two were elderly with health issues (one of whom did not have internet access), and three had inadequate cellular coverage.

In May 2012, Consort modified the smart meter installation procedure. Going forward, the installer would remove any smart meters with inadequate cellular coverage (i.e. not communicating with Consort's system) during the initial installation appointment.

Table 14 Residential Participation as of May 31, 2012

	KPCO Employee	Online Form	Mailed Customer Agreement	Total
Enrolled via Customer Solution Center	0	6	12	18
Signed Participation Contract	7	40	14	61
Smart Meter Installation	7	26	11	44
HAN Installation	7	21	10	38
Installation Scheduled	0	3	2	5
Unknown	0	3	0	3

The Load Management Pilot Program was approved in October 2010 and the tariff in December 2010. Kentucky Power solicited an implementation contractor and awarded the contract to Consert in December 2010. Consert began working with KPCO staff in January 2011 to establish the program infrastructure while the contract terms were negotiated and equipment testing was being conducted. A contract was signed in July 2011. AEP conducted rigorous testing of the device controller, gateway meter and Consert technology security. AEP Dolan Laboratory approved the HAN (energy management) equipment in April 2011 and AEP Canton Meter Laboratory approved the gateway meter, Rev. A model 200 ampere rating, in July 2011. The AEP Canton Meter Laboratory tested a new gateway meter, Rev. B model, and approved usage for the 320 ampere and 200 ampere rated meter in January 2012. Automated billing for program participants was completed in February 2012.

In November 2011, Consert issued an RFP to solicit licensed electricians to perform the equipment installations. Two installation contractors were selected, one in the northern region and one in the southern region of the KPCO service territory. The installation contractor in the southern territory elected to back out of the program in April 2012.

The load management technology can only be utilized within a network that carries the Verizon Wireless signal. The new gateway meters (Rev. B model) are capable of working with other providers and Consert's future plans include working with other providers. Approximately 65 percent of the KPCO service territory is within the Appalachian Wireless network, with the Verizon network primarily covering five counties in the southern region and the Ashland District in the north. Consert received detailed coverage data from Verizon Wireless. The Appalachian Wireless network carries the Verizon Wireless signal and reported that the system was 95 percent reliable, but did not provide detailed coverage data. In February 2012, Consert made the decision to begin installations within the Appalachian Wireless network.

The program was initially offered to KPCO employees beginning September 2011 and later to KPCO customers in the Ashland District beginning January 2012. The first employee installation occurred in September 2011 utilizing Consert certified technicians and the first external customer installation occurred in February 2012 utilizing the Consert installation contractor. The first load event occurred on February 29, 2012.

Participants have multiple avenues for program assistance, including Kentucky Power customer solution center, the installer and Consert. The KPCO program website provides Kentucky Power customer

solution center contact information while the program paperwork, including the Welcome Packet and the online portal, provide Consert customer service contact information.

5.1.2 Program Awareness and Marketing Strategies

Kentucky Power utilizes targeted marketing to customers likely to be eligible for the program. Marketing activities included phone blasts, emails, direct mail, program brochures and the KPCO website. According to participating customers surveyed, customers most often learned of the program from KPCO direct mail. The primary reason for participating was saving money and energy.

Targeted marketing to customers within the Ashland District began in January 2012. Targeted marketing to customers in Pike, Perry and Letcher counties was anticipated to begin in April 2012 but was cancelled due to issues with Consert installation contractors.

5.1.3 Program Tracking

Consert manages and tracks all customer information and load event data as well as customer usage data for the HVAC equipment, water heater, programmable thermostat settings and room temperature. An online management system, the Utility Campaign Management System ("UCMS"), is utilized to track customer information and status within the program. An online portal, the Utility Portal, is utilized to manage the load management data, including monitoring energy consumption, starting and stopping load control events and managing customer energy management accounts.

Consert provides weekly status reports summarizing the contracts received, installations scheduled, meter installs, complete installs, disqualified customers and the number of accounts in the scheduling queue. The data is manually pulled from UCMS and some inputs are estimated based on recent installation activities. Therefore, discrepancies occasionally appear in the reports. Consert anticipates automating the UCMS reports utilized to provide the weekly and monthly status reports to KPCO within the next 3 to 6 months.

Within three business days of an event, Consert provides load control event data including, but not limited to, energy and demand shed during the event, number of HVAC units and water heaters, and number of customers that opted-out. Consert will not initiate more than 15 scheduled load events, up to 150 hours, during a season. Consert anticipates incorporating load event data into the weekly status reports within the next 3 to 6 months, including the number of participants per event, number of load events, number of load event hours and the demand reduced during the event.

Consert databases and system snapshots are backed-up on a nightly basis and the system would be restored within 12 hours of any technical issue. The smart meters contain 3-days of energy usage data and customer programmable thermostat settings. However, Consert does not have the ability to restore/recreate customer programmable thermostat settings if an account is reset or cancelled. Consert plans to develop this capability by Spring 2013.

The UCMS system contains a number of reports and a database of potentially eligible KPCO customers, searchable by customer name or address. However, the UCMS reports contain varying levels of information; a few only contain customer counts with no identifiable customer information (i.e.

customer name or account number). Additionally, the database may contain multiple entries for the same customer.

5.1.4 Customer Satisfaction

Participants are generally satisfied with the pilot program, particularly the online energy management services. However, there may be a lack of understanding on how to program the thermostat. According to the participant survey,

- 60% of program participants contacted customer service to get a better understanding of how to set/adjust the thermostat settings.
- Participants recommended the program provide additional training on how to operate the programmable thermostat, especially how to set/adjust the temperature and access the online web application.
- 87% had adjusted the temperature settings, primarily using the online portal (60%) followed by the programmable thermostat itself (33%).

5.2 Recommendations

AEG has several recommendations on how to improve the program. These include:

AEG recommends an impact evaluation commence after a full summer and winter season of load data is available to determine energy and demand savings. Data from a full year of control events must be collected before a meaningful impact evaluation can be conducted. An evaluation of the load impacts and program cost-effectiveness could be conducted in Fall 2013.

5.2.1 Encourage Online Enrollment

AEG recommends that KPCO modify customer enrollment options to encourage online enrollment. Participants must have internet access and be an experienced internet user to properly program the thermostat and make modifications to the thermostat settings. KPCO should limit mailed/faxed Customer Agreement applications to renters. The Customer Agreement application should be removed from the program website. Customers can be provided the KPCO customer solution center contact if there are enrollment issues or they need to be mailed/faxed a Customer Agreement.

AEG recommends that the Customer Agreements are submitted directly to Consert rather than to Kentucky Power staff. Currently, KPCO receives the applications submitted via mail or fax, and can upload the file to the UCMS customer record indicating the date the contract was received. Additionally, the Customer Agreements should consistently be uploaded to the UCMS customer record.

5.2.2 Consider Program Modifications

AEG recommends that Kentucky Power work with Consert to engage an installation contractor for the southern territory. The installation contractor in the southern territory elected to back out of the program in April 2012 and Consert has been unable to find another contractor located within that territory. Preferably, an installation contractor within the southern territory would conduct the installations and provide response to service calls. However, if this is not possible, the installation

contractor in the northern territory is willing to conduct the installations. Consert needs to ensure that the travel will not negatively impact the program or the services provided by the installation contractor and that the contractor can provide adequate response to customer service and/or equipment maintenance calls.

AEG recommends that the Consert representative review the program with the customer when scheduling the installation appointment. In an effort to minimize disqualifications and withdrawals after the gateway meter has been installed, the representative should remind the customer that the load management equipment adjusts household temperature and the thermostat is operated via the internet.

AEG recommends that the personal energy management account log-in webpage provide Consert's customer service contact information.

AEG recommends that the installation contractor provide a basic overview of the programmable thermostat online capabilities at the time of the installation. Approximately 60 percent of survey respondents contacted customer service, primarily to receive a better understanding of the thermostat temperature settings and how to adjust the settings. Additionally, survey respondents recommended additional training on how to operate the programmable thermostat, especially how to adjust the temperature and access the online web application.

AEG recommends that Consert improve the reporting process and automate some reporting functions, as anticipated. Manually counting the number of entries in UCMS can lead to discrepancies and it is necessary for Kentucky Power to have accurate program data. The UCMS system contains a number of reports and a database of potentially eligible KPCO customers. However, the UCMS reports contain varying levels of information; a few only contain customer counts with no identifiable customer information (i.e. customer name or account number). Additionally, the database may contain multiple entries for the same customer. The UCMS system should contain a downloadable report of all participating customers, including customer contact information (name, address and account number) as well as their status in the program. The UCMS systems should also contain a database of customers enrolled in the program, separate from the database of eligible customers. The database should list all enrolled customers and provide a link to the customer record as well as have a search function by customer name, address or account number.

5.2.3 Modify Marketing

AEG recommends that Kentucky Power work with Consert to modify marketing materials and activities.

4. Materials should emphasize online enrollment. For example, materials should direct customers to the Load Management Program website rather than provide the KPCO customer solution center telephone number.
5. Materials should highlight the ability for the customer to control their energy use from the internet. According to Consert, emphasizing online capabilities may attract a different type of customer to the program. For example, an experienced internet-user interested in the convenience of online temperature management.

6. Redefine marketing responsibilities. Of the 55 customers that contacted Kentucky Power customer solution center, 67 percent did not sign the agreement to participate in the program. There was no follow-up to determine why these customers did not sign the agreement.

Appendix A. Customer Survey

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We have been retained by Kentucky Power to conduct a survey of their SMART Energy Management Pilot Program. I'd like to talk with you about your impression of the program and get some feedback. This is NOT a sales effort, but for research purposes only. The survey should only take 5 to 10 minutes. All comments will remain confidential.

According to our records, you are participating in the SMART Energy Management Load Management Pilot Program. If the customer does not recall the program: "The pilot program provides free programmable thermostats and an energy management device to adjust your central electric cooling system and/or electric water heater during periods of high electricity demand."

Program Participation

1. Did you have a energy management device installed on your:
 - a) Central Air Conditioner (7)
 - b) Heat Pump (11)
 - c) Electric Water Heater (12)
2. Do you pay your Kentucky Power bill online?
 - a) Yes (11)
 - b) No (5)
3. How did you first become aware of the SMART Energy Management Pilot Program? (Indicate first mention)
 - a) Kentucky Power employee (3)
 - b) KentuckyPower.com (2)
 - c) Email
 - d) Bill Insert (2)
 - e) Postcard (7)
 - f) Telephone Call
 - g) Word of Mouth (Friend / Neighbor) (1)
 - h) Community event/meeting/presentation
 - i) Other (verbatim)
4. Why did you decide to participate in this program? (Mark all that apply – DO NOT READ)
 - a) Wanted to save energy (4)
 - b) The free programmable thermostat
 - c) Access to online energy management software (1)
 - d) Bill credits offered by Kentucky Power
 - e) Other (verbatim)
 - Save money (9)
 - Don't Know (1)

Program Installation

5. Was the process of having the programmable thermostat and energy management device installed (READ ANSWERS)
 - a) Very easy (7)
 - b) Somewhat easy (5)
 - c) Somewhat difficult (2)

- d) Very difficult (If very difficult, ask why) (1)
Was given several appointments to which no one showed up before meeting success

6. Was the installer:

	Yes	Somewhat	No	Comments
a) Flexible about scheduling the installation appointment	13	1	1	
b) On time for the appointment	12	1	2	
c) Neat/courteous	14	1	0	

7. About how long did it take to install the programmable thermostat and energy management device?
 (READ ANSWERS)

- a) Less than one hour (1)
 b) 1 to 2 hours (2)
 c) 2 to 3 hours (7)
 d) More than 3 hours (5)

8. Who initially programmed the thermostat?

- a) Installer (9)
 b) Customer Service (2)
 c) Other (verbatim)
 Customer (4)

9. Did the installer provide adequate training on how to operate the programmable thermostat?

- a) Yes (skip to question 11) (8)
 b) No (continue to next question) (7)

Only knew default settings

10. What additional training should be provided? (READ ANSWERS)

- a) How to operate the programmable thermostat (5)
 b) How to opt-out of a load management event
 c) How to adjust temperature settings (3)
 d) How to access the online web application (1)

11. Have you had any reason to contact the installer or Kentucky Power?

- a) Yes (If yes, ask the reason why) (9)
 b) No (6)

Needed better explanation of temperature settings for the thermostat (1)

When a new heat pump was needed, KPCO disconnected the pilot system and it shocked the installer (1)

Programmable thermostat needed readjustment (5)

Setting up online account (1)

Lost accessibility(1)

12. Have you contacted customer service for any reason?

- a) Yes (continue to next question) (9)
 b) No (skip to question 14) (6)

There was no access to the web-application from an i-pad

Programming issues with the online web application

Log-in issues at the beginning of the program

13. How would you rate your experience with customer service? (READ ANSWERS)

- a) Inadequate (1)
 b) Slightly adequate (2)
 c) Somewhat adequate (4)

- d) Excellent (3)
14. Do you find the programmable thermostat is easy to use/understand?
 a) Yes (12)
 b) No (If no, ask why?) (3)
*It's a gradual learning process, too much to pick up at the outset.
 getting temp info from inputs
 moderately, some trouble*
15. Outside of a control event, have you adjusted the temperature settings on your programmable thermostat?
 a) Yes (continue to next question) (13)
 b) No (skip to question 17) (2)
16. How do you adjust the temperature settings?
 a) On-line customer web application (9)
 b) Phone support
 c) Mobile device (1)
 Thermostat (5)

Customer Satisfaction

17. Please rate your satisfaction with the following on a five-point scale, where "5" means "Very Satisfied" and "1" means "Very Dissatisfied." How satisfied are you with the:

	Very Dissatisfied	2	3	4	Very Satisfied	Don't Know
a) Installation/Installer	1	0	1	6	7	
b) Installer training	0	2	3	3	7	
c) Programmable thermostat	0	0	6	2	7	
d) Online services	0	0	4	2	8	1
e) Control events	0	0	1	4	3	7
f) Program overall	0	0	1	5	8	1

Comments (verbatim)

18. Would you recommend the program to someone else?
 a) Yes (14)
 b) No (1)
Yes, but would need to talk to them about the pros/cons first.
19. How could the Kentucky Power program be improved?
 a) More publicity/advertise it (1)
 b) Improve the installation process (2)
 c) Improve the support process (5)
 d) Better explanation of the program (6)
 e) Easier to reach people at Kentucky Power
 f) No suggestions/good the way it is (2)
 g) Other (verbatim)
*Installer needs better training (1)
 Inform customers the installation is a long process, not a simple walk-in (1)
 Improve online application and support (2)*

Thank you for taking the time to answer my questions!



Kentucky Power Company
Residential Efficient
Products Program
Process, Market and Impact Evaluation · July 2012

Submitted by

Applied Energy Group, Inc
1377 Motor Parkway, Suite 401 · Islandia, NY 11749
Tel (631) 434-1414 · Fax (631) 434-1212
www.appliedenergygroup.com

Abstract

Kentucky Power Company retained Applied Energy Group to conduct a process, market and impact evaluation of its Residential Efficient Products Program. ENERGY STAR® qualified lighting uses up to 75 percent less energy and lasts up to 10 times longer than standard incandescent bulbs. Replacing existing incandescent light bulbs with ENERGY STAR® qualified lighting, such as compact fluorescent lighting (CFLs), is one of the simplest and most effective ways to reduce electric bills. The Residential Efficient Products Program utilizes upstream markdown incentives and in-store coupons to reduce the retail price of eligible products at participating retail stores as well as at the Kentucky Power online store. Kentucky Power provides incentives to participating retailers for actual products sold, verified with supporting sales documentation.

To arrive at the final recommendations of the process, market and impact evaluation, AEG reviewed program materials, assessed Kentucky Power's program tracking and conducted interviews with Kentucky Power program staff, the third-party program implementation contractor and participating retailers. The results of the analysis, along with key findings and recommendations for program improvements, are included in this report.

Table of Contents

Abstract	ii
Abbreviations	i
Definitions	ii
Executive Summary	v
1. Introduction.....	1
2. Energy Independence and Security Act (EISA)	1
3. Program Description	2
4. Evaluation Methodology	4
5. Process and Market Evaluation Findings.....	7
5.1 Program Logic Model	7
5.1.1 Activities and Outputs	10
5.1.2 Outcomes	11
5.1.3 External Factors.....	12
5.1.4 Best Practices	12
5.2 Program Performance	12
5.3 Program Marketing	15
5.4 Program Tracking & Invoice Processing	18
5.5 Retailer Interviews	20
5.6 Opportunities for Improvement.....	22
6. Impact Evaluation Findings	23
6.1 Gross Energy and Demand Savings	23
6.2 Net Energy and Demand Savings	24
6.2.1 Free Ridership.....	24
6.2.2 Spillover	25
6.3 Program Cost-Effectiveness	26
7. Key Findings and Recommendations	28
7.1 Key Program Findings.....	28
7.1.1 Program Performance Indicators	28
7.1.2 Program Tracking	29
7.1.3 Program Awareness and Marketing Strategies.....	29
7.1.4 Best Practices	29
7.1.5 Verification and Documentation of Program Impacts	29
7.2 Recommendations	30
7.2.1 Engage Independent Retailers and Reduce Barriers to Entry	30
7.2.2 Review Product Offerings.....	30
7.2.3 Increase Marketing and Promotional Activities.....	31
Appendix A. Walmart/Lowe's Retailer Survey	32
Appendix B. Independent Retailer Survey	35
Appendix C. Cost-Effectiveness Analysis Inputs	37

List of Tables

Table ES1 2011 CFL Bulb Sales by Manufacturer/Retailer	vi
Table ES2 Participation Goal versus Sales, 2011	vi
Table ES3 2011 CFL Bulb Savings by Type	vii
Table 1 EISA Phase 1 Standard	2
Table 2 Eligible Products and Rebates	3
Table 3 Program Budget, 2010-2012	4
Table 4 Program Participation Goals, 2010-2012	4
Table 5 Expected Energy Savings per Participant	4
Table 6 Overview of IPMVP Options	6
Table 7 Manufacturer/Retailer MOU Allocation, 2011	13
Table 8 CFL Bulb Sales by Manufacturer/Retailer, 2011	13
Table 9 Total Bulbs and Incentives by Retail Location, 2011	13
Table 10 2011 Cost per Bulb, Budgeted and Actual	15
Table 11 2011 Promotional Events	17
Table 12 Gross Savings per Unit, 2011	23
Table 13 Total Gross Demand and Energy Savings, 2011	24
Table 14 Net Demand and Energy Savings, 2011	24
Table 15 Free Ridership Probability Scores, Questions 1 and 2	25
Table 16 Free Ridership Weighted Probability	25
Table 17 Spillover Probability Scores, Questions 1 and 2	26
Table 18 Spillover Weighted Probability	26
Table 19 Cost-Effectiveness Results	27
Table 20 Kentucky Power Portfolio Cost-Effectiveness Results, 2011	28
Table 21 Participation Goal versus Sales, 2011	28
Table 22 2011 CFL Bulb Savings by Type	30

List of Figures

Figure 1 Program Logic Model	9
Figure 2 Number of Bulbs Rebated by Manufacturer by Month Sold, 2011	14
Figure 3 Expenditures and Number of Bulbs Reported by Month, 2011	15
Figure 4 APT Field Representative Site Visits by Month, 2011	17
Figure 5 APT Field Representative Training by Month, 2011	18
Figure 6 APT Field Representative Training by Retailer, 2011	18
Figure 7 Eligible Lighting Stock at Retailer Stores	20
Figure 8 Highest Selling Lighting Products	21
Figure 9 Non-Standard CFLs Sales Compared to Standard CFLs, Walmart/Lowe's Retailers	21
Figure 10 Kentucky Power Influence in Moving CFL Stock in 2011, Walmart/Lowe's Retailers	21
Figure 11 Adequacy of Kentucky Power Promotional and Education Efforts	22

Abbreviations

AEG	Applied Energy Group, Inc.
AEP	American Electric Power
APT	Applied Proactive Technologies
CFL	Compact Fluorescent Lighting
EFI	Energy Federation Incorporated
EM&V	Evaluation Measurement and Verification
DSM	Demand Side Management
IPMVP	International Performance Measurement and Verification Protocols
KPCO	Kentucky Power Company
LED	Light Emitting Diode
MOU	Memorandum of Understanding
NTG	Net-To-Gross Ratio
PSC	Public Service Commission
QA/QC	Quality Assurance/Quality Control

Definitions

Benefit-Cost Ratio: The ratio of total benefits of a program to the total costs discounted over some specified time period. The benefit-cost ratio gives a rough measure of the participant rate of return and provides an indicator of program risk. A ratio above one indicates a beneficial program.

Participant Cost Test: Measures the quantifiable benefits and costs to the customer due to participation in a program.

Program Administrator Cost Test: Measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs), excluding any net costs incurred by the participant. The benefits are similar to the Total Resource Cost benefits, but costs are more narrowly defined.

Ratepayer Impact Measure (RIM) Cost Test: Measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected are less than the total costs incurred by the utility. The RIM test indicates the direction and magnitude of the expected change in customer bills or rate levels.

Total Resource Cost (TRC) Test: Measures the net costs of a demand side management program as a resource option based on the total costs of the program, including both the participant and utility costs.

Coincidence Factor: The ratio, expressed as a numerical value or as a percentage, of the simultaneous maximum demand of a group of electrical appliances or consumers within a specified period to the sum of their individual maximum demands within the same period.

Compact Fluorescent Light Bulb: An efficient electric light source that uses about 75 percent less energy than incandescent bulbs. In a CFL, an electric current is driven through a tube containing argon and a small amount of mercury vapor. This generates invisible ultraviolet light that excites a fluorescent coating (called phosphor) on the inside of the tube, which then emits visible light.

Standard CFL: The most common form of basic CFL that can be identified by its characteristic spiral tube.

Non-Standard CFL: A variety of CFL that come in different shapes and may have additional features such as dimming.

Cost-effectiveness: A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the lowest cost alternative for the achievement of a given target.

Demand Side Management (DSM): Programs designed to provide incentives to end-use customers or curtailment service providers to enhance the ability and opportunity for reduction of load during peak hours.

Evaluation Measurement and Verification: A set of analyses used to assess energy efficiency programs in terms of energy and demand savings and cost-effectiveness. There are several approaches to EM&V, some of which have been codified as best practices (see IPMVP). Most energy efficiency programs are subject to some type of EM&V.

GRIDSSMART[®] Programs: An AEP energy efficiency initiative that includes over 100 energy efficiency programs across the AEP service territory. The programs feature smart grid technologies such as smart meters, voltage optimization equipment and smart appliances that can reduce energy use.

Gross Energy Savings: Energy and demand savings seen by the participant at the meter. These are the appropriate program impacts to calculate bill reductions for the Participant Test.

Impact Evaluation: A method of evaluation that assesses any changes, intended or unintended that are directly attributable to an energy efficiency program.

Independent Retailer: A retail business that is owned and operated by the same person outside of a larger company chain.

International Performance Measurement and Verification Protocols (IPMVP): Provides an overview of current best practice techniques available for verifying results of energy efficiency, water efficiency, and renewable energy projects in commercial and industrial facilities. It may also be used by facility operators to assess and improve facility performance. Energy conservation measures covered in the protocols include fuel saving measures, water efficiency measures, load shifting and energy reductions through installation or retrofit of equipment, and/or modification of operating procedures.

Kilowatt (kW): A unit of power that describes the rate at which energy is generated or used. It quantifies the electric power required by an appliance or device such as a light bulb.

Kilowatt Hour (kWh): A unit of energy that describes how much electricity is consumed over a period of time. For example, if you turn on a 100 watt light bulb all day for 24 hours the light bulb consumed 2.4 kWh of electricity.

Light Emitting Diode (LED) Bulb: Small light sources that become illuminated by the movement of electrons through a semiconductor material. LEDs emit light in a specific direction, whereas an incandescent or fluorescent bulb emits light — and heat — in all directions. For direct lighting applications LED lighting uses both light and energy more efficiently. LED lighting, when designed well, can be more efficient, durable, versatile and longer lasting than incandescent and fluorescents lighting.

Memorandum of Understanding (MOU): A document that details the criteria that retailers and manufacturers must meet to participate in the program. Walmart and Lowe's entered into an MOU for the Residential Efficient Products Program.

Net Energy Savings: The energy and demand savings attributable to the program, adjusted for free riders and spillover.

Net-to-Gross (NTG) Ratio: The ratio of net energy savings to gross energy savings indicates the overall effectiveness of an energy efficiency program. As the NTG ratio approaches one, the magnitude of the program impact increases.

Free Riders: Customers who participate in energy efficiency programs who would have engaged in the efficient behavior in the absence of the program. As a result, the presence of free riders tends to overestimate the energy savings of the program.

Spillover: Customers who engage in energy efficient behavior, but do not participate in the program, due to some influence of the program.

Process Evaluation: A method of evaluation that uses empirical data to assess the delivery of energy efficiency programs, verify goals and determine whether the program is implemented as designed.

Program Logic Model: Graphic representations of an energy efficiency program and its processes. Logic models shows the causal relationships or linkages among the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders critical to a program's performance.

Standard Incandescent Light Bulb: A common light bulb that produces light by heating a filament wire to a high temperature until it glows. With up to 90 percent of its energy emitted as heat, it is among the least efficient sources of electric light.

Upstream Markdown Incentive: A method of promoting energy efficiency by reducing manufacturer, distributor and retailer costs prior to the point of sale to the consumer at the retail level.

Executive Summary

Applied Energy Group, Inc ("AEG") was retained by Kentucky Power Company ("KPCO" or "Kentucky Power") to conduct a process, market and impact evaluation of its Residential Efficient Products Program. ENERGY STAR® qualified lighting uses up to 75 percent less energy and lasts up to 10 times longer than standard incandescent bulbs. Replacing existing incandescent light bulbs with ENERGY STAR® qualified lighting, such as compact fluorescent lighting ("CFLs"), is one of the simplest and most effective ways to reduce electric bills. The Residential Efficient Products Program utilizes upstream markdown incentives and in-store coupons to reduce the retail price of eligible products at participating retail stores as well as at the Kentucky Power online store. Kentucky Power provides incentives to participating retailers for actual products sold, verified with supporting sales documentation.

AEG designed the process and market evaluation to examine program processes and retailer responses to the program. The evaluation identifies methods for gathering data and measuring program results, and makes recommendations for program improvements. To arrive at the final recommendations, AEG performed the following tasks:

- Reviewed program materials and data.
- Reviewed program tracking methods.
- Updated program logic model and assessed program flow.
- Conducted interviews with KPCO staff, the program implementer and participating retailers.

AEG designed the impact evaluation to assess the gross and net demand savings, gross and net energy savings, and the cost-effectiveness of installed measures. The evaluation verifies gross and net savings and measure installation. To verify program impacts AEG performed the following tasks:

- Calculated the gross energy (kWh) and peak (kW) impacts by lighting type using engineering calculations.
- Performed cost-effectiveness analysis using a benefit-cost analysis model.

Summary of Key Findings

The goal of the Residential Efficient Products Program is to produce long-term energy savings in the residential sector by increasing the market share (sales) of ENERGY STAR® CFLs and other ENERGY STAR® lighting products sold through retail sales channels.

Program Performance Indicators

In 2011, 13 participating retailers sold 133,692 CFLs, exceeding the overall program goal of 125,800 bulbs. Ninety-three (93) percent of sales were standard CFLs and the remaining 7 percent were non-standard CFLs. Walmart accounted for 89 percent of all sales and Lowe's accounted for 11 percent of all sales. According to APT, independent retailers did not submit any coupons for reimbursement. Incentives accounted for 43 percent of total actual expenditures, at an average cost of \$1.01 per bulb.

The total actual cost of \$2.35 per bulb was slightly less than the budgeted cost of \$2.92 per bulb (as revised in August 2011).

Table ES1 2011 CFL Bulb Sales by Manufacturer/Retailer

Manufacturer/Retailer	Standard CFL	Non-Standard CFL	Total CFL
Felt/Lowe's	-	3,258	3,258
Sylvania/Lowe's	12,081	46	12,127
General Electric/Walmart	111,867	6,440	118,307
Total	123,948	9,744	133,692

Table ES2 Participation Goal versus Sales, 2011

	Goal	Sales
CFLs	125,000	133,692
ENERGY STAR Ceiling Fans	200	-
LED Products	600	-
Total	125,800	133,692

Although the program was successful in promoting CFL sales, there were no sales of ENERGY STAR® ceiling fans and LED products. APT noted that the residential market for LED holiday lights and LED night lights has already transformed and does not require incentives. Additionally, customer purchases of ceiling fans and fixtures are based primarily on aesthetic preferences.

Walmart/Lowe's retailers noted that CFLs are the best selling lighting product while independent retailers noted that incandescent bulbs are still the best selling product. According to APT, the independent retailers comprise less than 8 percent of the lighting market and have difficulty competitively pricing CFLs compared to large stores such as Walmart or Lowe's.

Program Tracking

Program data is managed and tracked by EFI and APT. The program tracking and monitoring systems accurately track program data and process invoices. On average, the invoicing process took 4 to 6 weeks from the time the manufacturer submitted the sales data to when they received reimbursement from EFI.

Program Awareness and Marketing Strategies

APT and Kentucky Power marketed the program to residential customers as well as lighting manufacturers and retailers within the KPCO service territory. In 2011, the APT Field Representative participated in 25 promotional events, including in-store promotions and KPCO community events, conducted 384 site visits and trained 3,537 individuals at participating stores. Seventy-one (71) percent of APT Field Representative training took place at Walmart stores, compared to 27 percent at Lowe's stores and 2.3 percent at the independent retailers.

Best Practices

Kentucky Power's program design and processes are largely consistent with best practices for similar energy efficiency programs. Eighty-five (85) percent of energy efficiency programs targeted at

residential customers provide incentives for compact fluorescent lighting.¹ Incentives for residential lighting typically range between \$0.50 and \$3.50 for CFLs, \$10 and \$30 for LED Bulbs, and \$15 and \$25 for ceiling fans. Depending on the design of the program, these incentives are typically point-of-sale discounts, mail-in rebates or instant rebates.²

Challenges posed by lack of information are ubiquitous in energy efficiency programs. Investment in education and outreach boosts awareness of the potential benefits of energy efficiency. Successful marketing strategies can increase program participation, increase energy savings and enable the delivery of more sophisticated energy efficient programs. Achieving maximum benefits from energy efficiency programs requires establishing clearly defined goals that are linked to overall program objectives as well as modifying the program over time.³

Verification of Program Impacts

Based on the participating retailer survey results, free ridership is estimated at 22 percent and spillover at 17 percent. Therefore, the net-to gross ratio for the Residential Efficiency Products Program is 95%.

Table ES3 2011 CFL Bulb Savings by Type

Measure	Gross Peak Savings (kW)	Gross Energy Savings (kWh)	NTG Ratio	Net Peak Savings (kW)	Net Energy Savings (kWh)	TRC
Standard CFL	607	5,989,416	95%	576	5,689,945	2.37
Non-Standard CFL	62	610,361	95%	59	579,843	2.55
Program Total	668	6,599,777		635	6,269,788	2.39

Recommendations

AEG has several recommendations on how to improve the program. These include:

Engage Independent Retailers and Reduce Barriers to Entry

AEG recommends that Kentucky Power work with APT to engage independent retailers and reduce barriers to entry. Independent retailers comprise less than 8 percent of the lighting market and cannot competitively price CFLs compared to large stores such as Walmart or Lowe's. Nevertheless, it is important to keep independent retailers in the program as it allows customers greater access to the program and efficient lighting products.

Two barriers to entry for independent retailers include:

- o Lack of in-store promotions and staff training. The APT Field Representative did not actively engage independent retailers, with 1 in-store promotion and 2.3 percent of training, despite APT's attempts to recruit additional independent retailers. The Field Representative should conduct more frequent in-store promotions for these retailers.

¹ Consortium for Energy Efficiency (2012). State of the Efficiency Program Industry: Budgets, Expenditures and Impacts 2011.

² ICF International. ENERGY STAR Summary of Lighting Programs, October 2011 Update.

³ National Action Plan for Energy Efficiency (2010). *Customer Incentives for Energy Efficiency Through Program Offerings*. Prepared by William Prindle, ICF International, Inc. <www.epa.gov/eeactionplan>

- Participant data requirements. Current in-store instant coupons require independent retailers to collect customer name, address and telephone, while Walmart and Lowe's stores collect only product information. Collection of customer data is a barrier to participation for independent retailers that Walmart and Lowe's stores are not subject to. As with the Walmart and Lowe's stores, the independent retailers are located within KPCO territory. Therefore, AEG recommends that the in-store instant coupons be modified to collect only the product information that Walmart/Lowe's stores collect.

Addressing these barriers to entry is necessary to increase participation among independent retailers. Any decision to increase engagement with independent retailers could affect the program's cost-effectiveness. If the program goal is to reduce overall energy consumption at the lowest cost, then the program should encourage large scale retailer participation. Engaging independent retailers at multiple locations would broaden the geographic reach of the program, which corresponds to the current program goal.

Review Product Offerings

AEG recommends that Kentucky Power review the current program offerings and examine the cost-effectiveness of incentivizing additional lighting measures.

- Remove incentives for LED holiday lights, LED nightlights and ENERGY STAR ceiling fans. Kentucky Power did not achieve any sales of LED nightlights, LED holiday lights and ENERGY STAR ceiling fans. Additionally, APT noted that the market for LED holiday lights and LED night lights has already transformed and purchases of ceiling fans are based on aesthetic preferences.
- Establish separate goals for standard and non-standard CFLs. Establishing goals will allow Kentucky Power to determine the progress of the program in terms of achieving participation goals and remaining within the budget. Program progress will influence future program design (e.g. 2011 program participation goals were exceeded, therefore Kentucky Power could increase 2012/2013 participation goals).
- Examine the cost-effectiveness of incentivizing LED bulbs, the next step in efficient lighting. The LED bulb market is maturing and costs are decreasing. AEG recommends that KPCO work with APT to determine which LED bulbs should be evaluated, the incentive levels and the participation goals.

AEG recommends that the incentive levels for the standard and non-standard CFLs remain the same through 2012, at which point the program should be reexamined. Incentives may be decreased slightly depending upon achievement of participation goals and other product offerings. Potential participation goals for consideration include 150,000 standard CFLs and 25,000 non-standard CFLs, to be adjusted based upon APT input, program performance and other product offerings.

AEG recommends that KPCO consider examining the cost-effectiveness of incentivizing other residential products. KPCO should work with APT to determine which products, such as smart strips or ENERGY STAR® refrigerators, should be evaluated, the incentive levels and the participation goals. Any decision to incorporate additional products into the program portfolio could affect the program's cost-

effectiveness. In addition to cost-effectiveness, KPCO should consider the customer benefit of incorporating the additional products and the potential energy savings.

Increase Marketing and Promotional Activities

AEG recommends that Kentucky Power continue current marketing and promotional activities, particularly the APT Field Representative in-store promotions and staff training. Marketing materials, such as program fact sheets or handouts, should include education information to reduce customer concerns regarding the health and environmental impacts of CFL mercury content.

AEG recommends an increase in marketing and promotional activities for independent retailers, including APT Field Representative in-store promotions, in-store signage and potentially short-term cooperative marketing.

1. Introduction

Applied Energy Group, Inc. ("AEG") was retained by Kentucky Power Company ("Kentucky Power" or "KPCO") to conduct a comprehensive evaluation of its 2010-2012 Demand Side Management ("DSM") Program Portfolio.⁴ The 2010-2012 DSM Program Portfolio includes the Residential Efficient Products Program, Residential and Small Commercial HVAC Diagnostic and Tune-up Program, Commercial Incentive Program, Small Commercial High Efficiency Heat Pump and Air Conditioner Program, and the Residential and Small Commercial Load Management Pilot Program. The DSM programs will be evaluated concurrently and individual program Evaluation, Measurement and Verification ("EM&V") reports will be filed with the Kentucky Public Service Commission ("PSC") by the August 15, 2012 regulatory filing deadline.

Kentucky Power is an electric utility that serves approximately 175,000 customers in all or part of 20 eastern Kentucky counties.⁵ The utility is part of the American Electric Power ("AEP") system, which is one of the largest electric utilities in the United States.⁶ The 2010-2012 DSM Program Portfolio was implemented to help Kentucky Power and AEP reduce electricity use and peak demand, help customers lower their electricity bills, and encourage long-term change in the market through the adoption of energy efficiency technologies and services.

ENERGY STAR[®] qualified lighting uses up to 75 percent less energy and lasts up to 10 times longer than standard incandescent lighting. Replacing existing incandescent light bulbs with ENERGY STAR[®] qualified lighting, such as compact fluorescent lighting ("CFLs"), is one of the simplest and most effective ways to reduce electric bills. The Residential Efficient Products Program utilizes upstream markdown incentives and in-store coupons to reduce the retail price of eligible products at participating retail stores as well as at the Kentucky Power online store. Kentucky Power provides incentives to participating retailers for actual products sold, verified with supporting sales documentation.

This report describes the key findings from the process, market and impact evaluation and provides recommendations for improving program performance and operations. Section 2 provides an overview of the Energy Independence and Security Act of 2007. Section 3 provides a program description and Section 4 provides the process, market and impact evaluation methodology. Sections 5 and 6 present the process, market and impact evaluation findings. Key findings and recommendations are described in Section 7.

2. Energy Independence and Security Act (EISA)

The United States Congress passed the Energy Independence and Security Act ("EISA") of 2007 to promote energy efficiency through performance standards for electronic appliances and lighting. In particular, the legislation set efficiency standards for 'general service' light bulbs.

⁴ Kentucky Power's 2010-2012 DSM programs were approved in Case No. 2010-00095 and Case No. 2010-00198.

⁵ Kentucky Power. Facts, Figures & Bios. Accessed at www.kentuckypower.com/info/facts/

⁶ American Electric Power delivers electricity to more than 5 million customers in 11 states and ranks among the nation's largest generators of electricity, with almost 38,000 megawatts of generating capacity in the U.S.

The efficiency standards will be implemented in two phases, with higher efficiency requirements in each phase. From 2012 to 2014, standard light bulbs manufactured will be required to use approximately 20 to 30 percent less energy than current incandescent light bulbs. Phase 2 calls for a 60 percent reduction in light bulb energy use by 2020, or 45 lumens per watt.⁷

Table 1 outlines the first phase and the maximum rate wattage required to attain EISA phase one standards. For example, transitioning from the common incandescent light bulb to the more efficient CFL bulb can result in up to 78 percent energy savings. The table shows that the 100, 75, 60 and 40 Watt traditional incandescent bulbs will be not meet the efficiency standards as they take effect from 2012 to 2014.

Table 1 EISA Phase 1 Standard

Rated Lumen Ranges	Maximum Rate Wattage	Minimum Rate Lifetime	Effective Date	Efficacy Ranges (lumens per watt)
1490-2600 (~90W – 150W)	72	1000 hrs	1/1/2012	21 – 36
1050-1489 (~75W – 90W)	53	1000 hrs	1/1/2013	20 – 28
750-1049 (~60W – 75W)	43	1000 hrs	1/1/2014	17 – 24
310-749 (~30W – 60W)	29	1000 hrs	1/1/2014	11 – 26

The EISA legislation is not expected to have an impact on Kentucky Power's Residential Efficient Products Program at this time for the following reasons:

- Twenty-two bulb types are exempted from the EISA standard, such as 3-way bulbs, shatter resistant bulbs and high lumen bulbs.
- The effective dates of the EISA legislation pertain to newly manufactured bulbs, not existing stock. For example, while the first phase of the EISA legislation went into effect on January 1, 2012, customers will be able to purchase non-EISA mandated bulbs until stock runs out. A typical CFL bulb has an average life of 7 to 9 years.⁸ AEG utilized an average bulb life of 5 years for the cost-effectiveness analysis to account for the increasing lighting efficiency requirement in future years. The 5 year lifetime infers that the baseline wattage will be equivalent to standard CFLs in future years.
- Energy Star CFLs are still more efficient than the new incandescent bulbs that are compliant with EISA standards.

3. Program Description

ENERGY STAR[®] qualified lighting uses up to 75 percent less energy and lasts up to 10 times longer than standard incandescent lighting. Replacing existing incandescent light bulbs with ENERGY STAR[®] qualified lighting, such as CFLs, is one of the simplest and most effective ways to reduce electric bills.

⁷ See Database of State Incentives for Renewables & Efficiency (DSIRE). *Federal Appliance Standards*. Available at: www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US04R&re=1&ee=1

⁸ See Energy Star. Available at: www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=LB

The Residential Efficient Products Program utilizes upstream markdown incentives to reduce the retail price of eligible products at participating retail stores as well as at the Kentucky Power online store. Kentucky Power provides incentives to participating retailers for actual products sold, verified with supporting sales documentation. Table 2 illustrates the various efficient product rebates offered by participating retailers through the program and the customer purchase limit for claiming rebates. Rebates are available for Single-Pack and Multi-Pack CFLs, Non-Standard CFLs, LED Holiday Lights, LED Nightlights and ENERGY STAR® Ceiling Fans. Product selection and rebate amounts may vary by store.

Table 2 Eligible Products and Rebates

	Incentive	Annual Purchase Limit per Customer
Standard CFLs	\$1.00	12
Non-Standard CFLs	\$1.50	12
LED Holiday Lights	\$2.00	10
LED Night Lights	\$2.00	2
Energy Star Ceiling Fans	\$10.00	5

Kentucky Power entered into a Memorandum of Understanding (“MOU”) with manufacturers and retailers to offer upstream market incentives. The MOU details the criteria retailers and manufacturers must meet to participate in the program. Independent retailers that could not meet the MOU criteria were given the opportunity to participate in the customer coupon program.

The overall goal of the Residential Efficient Products Program is to produce long-term energy savings in the residential sector by increasing the market share (sales) of ENERGY STAR® CFLs and other ENERGY STAR® lighting products sold through retail sales channels. Program objectives include:

- o Increase participant satisfaction
- o Engage retailers within KPCO service territory, initially targeting retailers with large lighting sales.
- o Cost-effectively increase the sales and availability of efficient lighting.

The Kentucky Public Service Commission (“PSC”) approved a three-year budget and participation goals for the Residential Efficient Products Program. Tables 3 and 4 present the program budgets and participation goals for 2010 through 2012. The 2011 program budget was revised from the original filing to \$367,876. The 2012 program budget and participation goals were revised from the original filing to \$355,205 and 133,143, respectively. Table 5 shows the anticipated energy and demand savings per participant by product per the original filing.⁹

⁹ See Case No. 2010-00095, Case No. 2011-00300 and Case No. 2012-00051.

Table 3 Program Budget, 2010-2012

	2010	2011	2012
CFL Incentive/Markdown	\$31,250	\$125,000	\$125,000
Other Lighting Incentives	\$1,100	\$4,400	\$4,400
Admin./Promotion	\$17,000	\$55,000	\$55,000
Evaluation	\$1,000	\$1,000	\$15,000
Total Budget	\$50,350	\$185,400	\$199,400

Table 4 Program Participation Goals, 2010-2012

	2010	2011	2012
CFLs	31,250	125,000	125,000
Other Lighting Products	200	800	800
Total	31,450	125,800	125,800

Table 5 Expected Energy Savings per Participant

	Summer kW	Winter kW	Energy (kWh)
Indoor CFL	0.001	0.010	50
ENERGY STAR Ceiling Fans	0.003	0.026	180
LED Holiday Lights	-	-	4
LED Night Light	-	0.001	22

4. Evaluation Methodology

AEG designed the process, market and impact evaluation to determine the efficacy of program procedures and systems, evaluate the achievement of program objectives, provide insight into and recommendations for program improvement and verify the direct impacts of program activities.

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and quality assurance/quality control ("QA/QC") procedures are performing as designed and identifies issues or opportunities to improve these key elements. The goals of the process and market evaluation are to:

- Examine key performance indicators to identify participation or program issues;
- Conduct a comprehensive review of program tracking systems;
- Determine awareness levels as a way to refine marketing strategies and reduce barriers to program participation;
- Assist program implementers and managers to structure programs and achieve cost-effective savings while maintaining high levels of satisfaction;
- Provide recommendations for changing the program's structure, management, administration, design, delivery, operations or goals; and
- Determine if specific best practices should be incorporated.

Impact evaluations verify the energy and demand savings directly associated with a program and assess the cost-effectiveness of the DSM program. The goals of the impact evaluation are to:

- Verify the annual energy and coincident peak capacity savings and total resource benefit claims made by Kentucky Power; and
- Provide verification and documentation of DSM program impacts.

To arrive at the final recommendations, AEG carried out the following activities:

Review Program Materials

AEG reviewed current program materials, documents and processes, including the rebate applications and marketing and promotional materials. The review served as the basis for understanding whether the program has been implemented as planned and is on track to meet participation goals. The review was particularly important for preparing the interview guides and survey instruments for other process evaluation tasks.

Program Logic Model

AEG developed a program logic model based on the review of program materials and discussions with KPCO program staff. The model shows the linkages among the program's activities, outputs, key program stakeholders and outcomes and highlights potential external influences and program inputs.

Kentucky Power Staff Interview

AEG conducted a comprehensive group interview with Kentucky Power program staff in November 2011. The purpose of the interview was to get staff impressions of program implementation activities, program performance, marketing and customer awareness of the program, program data and tracking mechanisms, and opportunities for program improvements. Individual interviews with program staff, as well as informal discussions around program performance, were conducted between December 2011 and March 2012. Individual interviews focused on program design and delivery issues, program performance, potential areas of improvements, and overall program effectiveness.

Third-Party Implementer Interview

The Residential Efficient Products Program is implemented by the APT Team, comprised of Applied Proactive Technologies, Inc ("APT") and Energy Federation Incorporated ("EFI"). As program implementer, the APT Team worked with KPCO to develop the program goals and budget, product selection and incentives, program eligibility, and data collection, tracking and reporting. The respective roles of the APT team members are as follows:

- EFI receives, tracks and reports sales data, processes payments and manages the online store.
- APT fosters retailer relationships and manages the day-to-day program processes. An APT Field Representative conducts weekly visits with MOU retailers to check product stock, displays and product labels and to ensure retail pricing markdowns are current. The representative provides sales staff training and conducts in-store promotions.

AEG interviewed APT in November 2011 and January 2012. The interview provided information on program implementation activities, program data and tracking methods, and barriers to increased participation. AEG also obtained detailed information on program performance.

Retailer Interviews

AEG administered a 10 to 12 minute telephone survey to a sample of participating stores to assess product availability and sales, customer satisfaction, potential areas for improvement, marketing and coordination efforts, educational efforts, attitudes regarding energy efficiency and conservation, and program tracking as well as ascertain participant free ridership and spillover. The participating store survey guides can be found in Appendices A and B. Currently, 13 Walmart and Lowe's stores and 9 Independent Retailer stores are participating in the Residential Efficient Products Program. AEG conducted 11 surveys of participating stores.

Review Engineering or Deemed Savings Assumptions

AEG reviewed the engineering and/or deemed savings assumptions utilized by APT to calculate program energy and demand impacts. Kentucky Power's initial program filing deemed savings assumptions were reviewed to ensure consistence with the impact evaluation results.

Gross Energy and Demand Impacts

AEG determined the gross energy and demand savings of a representative sample based on Option A of the International Performance Measurement and Verification Protocols ("IPMVP")¹⁰ outlined in Table 6.

Table 6 Overview of IPMVP Options

IPMVP M&V Option	Measure Performance Characteristics	Data Requirements
Option A: Engineering calculations using spot or short-term measurements, and/or historical data	Constant performance	<ul style="list-style-type: none"> • Verified installation • Nameplate or stipulated performance parameters • Spot measurements • Run-time hour measurements
Option B: Engineering calculations using metered data.	Constant or variable performance	<ul style="list-style-type: none"> • Verified installation • Nameplate or stipulated performance parameters • End-use metered data
Option C: Analysis of utility meter (or sub-meter) data using techniques from simple comparison to multivariate regression analysis.	Variable performance	<ul style="list-style-type: none"> • Verified installation • Utility metered or end-use metered data • Engineering estimate of savings input to SAE model
Option D: Calibrated energy simulation/modeling; calibrated with hourly or monthly utility billing data and/or end-use metering	Variable performance	<ul style="list-style-type: none"> • Verified installation • Spot measurements, run-time hour monitoring, and/or end-use metering to prepare inputs to models • Utility billing records, end-use metering, or other indices to calibrate models

Engineering calculations referenced from the *New York Standard Approach for Estimating Energy savings from Energy Efficiency Programs*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts for standard and non-standard CFL bulbs.

¹⁰ IPMVP provides best practice techniques for verifying results of energy efficiency projects, i.e. verifying savings attributed to energy efficiency projects.

Net Energy and Demand Impacts

AEG adjusted the gross energy and demand savings to reflect estimates of free ridership and spillover. Free ridership and spillover were determined from the retailer interviews; see Section 6 for a detailed explanation.

Cost-Effectiveness Analysis

AEG analyzed the cost-effectiveness of the Residential Efficient Products Program utilizing Bencost, an updated version of a public domain model that AEG customized for Kentucky Power. Bencost is an input-output model that calculates four standard California cost-effectiveness tests, the Total Resource Cost, Participant Test, Utility Test and Rate Impact Measure Test. The analysis was conducted using Kentucky Power specific inputs, including avoided costs, discount rates, participation and incentives. Cost-effectiveness inputs and outputs are detailed in Appendix C.

5. Process and Market Evaluation Findings

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and quality assurance/quality control ("QA/QC") procedures are performing as designed. When potential deficiencies in these areas arise, the evaluation identifies opportunities for improving these key elements.

5.1 Program Logic Model

Program logic models are graphic representations of an energy efficiency program and its processes. Logic models show the causal relationships or linkages between the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders that are critical to a program's performance.¹¹

Key elements of a program logic model include:

- **Inputs.** Resources that program stakeholders contribute to a program, such as knowledge, skills, expertise, finances or equipment.
- **Outputs.** Program activities and number of people reached, based on program goals.
- **Outcomes.** Short-term, intermediate or long-term results of the program outputs. Assists evaluators and program administrators in establishing program results.
- **External Influences.** Factors outside the utility's control that may influence the program outcomes. They help to identify important program partnerships as well as the issue(s) the program can realistically influence. The factors help determine which evaluation measures will accurately reflect project outcomes or any other goals that must be met to address the problem or situation.

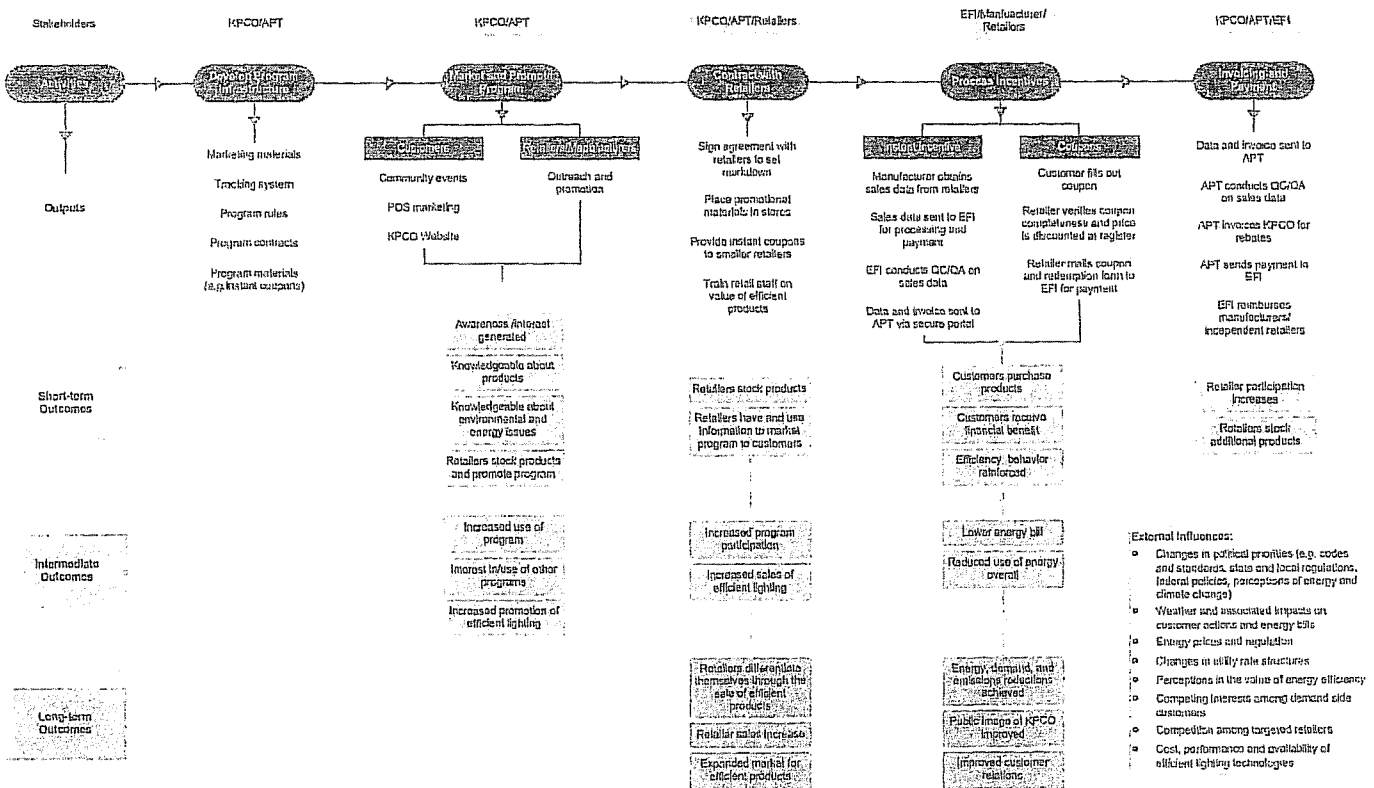
¹¹ McCawley, P. (2001). *The Logic Model for Program Planning and Evaluation*. Moscow: University of Idaho Extension.

In the logic model presented in Figure 1, program activities are oriented sequentially across the top of the page from the left to the right. The sequence of program activities is important. For example, the program's infrastructure, including its advertising materials, tracking systems, program rules, and contracts must be developed before the program can be marketed and customers recruited. The performance outputs and outcomes are oriented vertically from top to bottom. The box on the bottom right contains the external factors outside the utility's control that may affect program performance.

Kentucky Power Company's Residential Efficient Products Program Evaluation | 2012

Figure 1 Program Logic Model

Inputs: program funding, PSC goals and reporting requirements, AEP human resources and integrated resource goals, Kentucky Power program staff, implementation contractor resources and expertise, evaluation contractor resources and expertise, existing awareness of Kentucky Power



5.1.1 Activities and Outputs

There are five main activities in the Residential Efficient Products Program. The program activities and their corresponding outputs establish linkages between the situation the program is designed to address and the program's intended outcomes. Therefore, activities and outputs are discussed together.

Develop Program Infrastructure

Activities include gathering market knowledge, setting program goals, designing the program, establishing program rules, developing marketing approaches and content, and establishing institutional and operating structures. The APT Team designed the program with the assistance of Kentucky Power staff. Together they developed the program design, including product offerings, retailer relationships, data tracking system and marketing materials.

Market and Promote Program

The marketing strategy for the program included a combination of point-of-sale marketing, retailer outreach and promotion, and community events. Marketing activities included in-store shelf tags and beam stands, educational sheets, retailer training, and program fact sheets. The program was also marketed online through the KPCO website. Section 5.3 provides further analysis of the program marketing activities.

Contract with Retailers/Manufacturers

The Residential Efficient Products Program utilizes upstream markdown incentives to reduce the retail price of eligible products at participating retail stores as well as the Kentucky Power online store. Kentucky Power provides incentives to participating retailers for actual products sold, verified with supporting sales documentation.

APT, in collaboration with Kentucky Power program staff, identified potential manufacturers and retail stores to participate in the program and facilitated MOU negotiations between the parties. The MOU details the criteria retailers and manufacturers must meet to participate in the program. As part of the MOU, the manufacturers provided the up-front capital to the retailers. Current MOU agreements expire in June 2012.

The Memorandum of Understanding agreements with retailers and manufacturers were in place in March and April 2011.

Independent retailers that could not meet the MOU criteria were given the opportunity to participate in the customer coupon program. Under the customer coupon program, participating retailers agree to reduce the retail price of eligible products, provide documentation of eligible product sales, receive in-store materials such as shelf tags and beam stands as well as allow an APT Field Representative to train employees on the value of efficient products.

Process Customer Rebate

Processing customer rebates differs between MOU and customer coupon program participants. Customers that purchased a qualifying lighting product at a participating MOU retailer received a reduced retail price. The discounted price was only available for branded and non-branded products

made by manufacturers that entered into an MOU with Kentucky Power. The manufacturer received sales data from participating retailers and reviewed for completeness and accuracy. The manufacturer submitted the sales data to EFI for processing and payment. EFI staff reviewed the sales data for anomalies.

Customers that purchased a qualifying lighting product at an independent retailer filled out a coupon, which included product information as well as customer name, address and telephone number, and presented it to the cashier. The cashier checked the coupon for completeness and sold the product to the customer at the discounted price. After the sale, the independent retailer filled out a coupon redemption form that included a summary of the coupons by value, the address where the check was to be mailed and the total amount of expected redemption. The retailer then submitted both the coupons and the completed coupon redemption form to EFI. EFI staff reviewed the documentation for completeness and eligibility.

Customers also had a third option of purchasing a lighting product through the Kentucky Power online store. A discount was applied to participants that had a KPCO account number and address within the Kentucky Power service territory. The online store was managed by EFI, therefore purchase data was sent directly to EFI staff for review. Section 5.4 provides more in-depth analysis of customer rebate processing.

Invoicing and Payment

EFI generally submitted unaudited and audited sales data and coupon redemption data to APT on a bi-weekly basis, but frequency varied depending on volume. APT reviewed the audited sales data and ensured the data matches the manufacturer invoice. An audited invoice, with sales data, was submitted to Kentucky Power on a monthly basis, often within one or two days of receiving the audited sales data from EFI. Kentucky Power approved the invoice and submitted payment to APT within 10 days of receiving the invoice. APT submitted payment to EFI and EFI submitted payment to the manufacturer/retailer.

5.1.2 Outcomes

Outcomes are distinct from program outputs. Program partners (retailers) and target audiences (customers) respond to the program outputs resulting in program outcomes. The outcomes are divided into short-term, intermediate, and long-term outcomes.

Short-term Outcomes

When the program is marketed and promoted, awareness and interest in efficient lighting may increase among customers, manufacturers and retailers. Retailers may stock efficient lighting products and promote the program. Customers will receive a financial benefit from installing efficient lighting and participating in the KPCO program. The program may lead to an increased commitment to energy efficiency.

Intermediate Outcomes

Intermediate outcomes may include increased use of the program, interest in and use of other KPCO efficiency programs, increased promotion and sales of efficient lighting products, and lower energy bills.

Long-term Outcomes

The long-term outcomes may include an expanded market for energy efficient products. Retailers may strive to differentiate themselves from other retailers by increasing sales of efficient products. Additional outcomes include energy and demand savings, reduced utility emissions, fewer greenhouse gases emitted. Kentucky Power may enhance its public image as a utility that responds to customer needs without sacrificing consideration of environmental issues.

5.1.3 External Factors

Documenting external factors outside the control of Kentucky Power and its stakeholders improves program planning and evaluation by identifying important program partners, the activities the program can realistically influence, which evaluation measures will accurately reflect project outcomes, and other needs that must be met. External factors include:

- Changes in political priorities (e.g. codes and standards, state and local regulations, federal policies, perceptions of energy and climate change);
- Weather and associated impacts on customer actions and energy bills;
- Energy prices and regulation;
- Changes in utility rate structures;
- Perceptions in the value of energy efficiency;
- Competing interests among demand side customers; and
- Cost, performance and availability of efficient lighting technologies.

5.1.4 Best Practices

Program administrators encounter common challenges that hinder energy efficiency programs from achieving maximum benefits, including, but not limited to:

- Lack of information and awareness of energy efficiency benefits.
- Limited resources / High initial costs energy efficient technologies.
- Competing priorities among customers and program administrators.
- Lack of clear, well-communicated program goals that correspond to overall organizational goals.

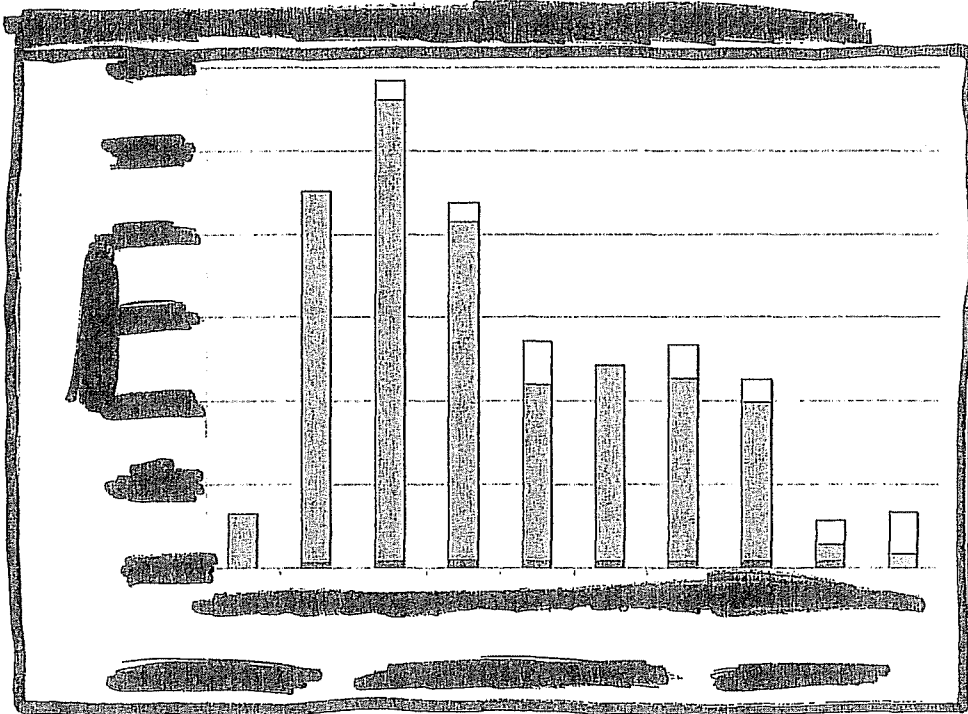
Best practices can provide ideas and/or tools to overcome these and other program barriers. Some key best practices include, but are not limited to, the following:

- Coordinate with other energy efficiency program administrators to overcome market barriers.
- Increase awareness by investing in education, outreach and marketing activities.
- Solicit stakeholder input and feedback to optimize program design and delivery.
- Develop reliable program tracking systems to support evaluation and implementation.

5.2 Program Performance

Table 7 outlines the budget and bulb allocation information for the 3 MOU agreements that were executed in March and April 2011. Nine (9) Walmart stores partnered with General Electric and 4 Lowe's

participating Walmart stores exceeded expectations. MOU allocations were modified multiple times in an effort to continue program operations in Walmart stores.¹² Despite the MOU modifications, Walmart eliminated all non-branded CFL packages from the promotion in October and had to suspend all promotions from November 7th to 28th to ensure the program did not exceed the approved budget. The budget was reviewed and the suspension lifted later in November. Despite the time lag associated with re-instating a program around Thanksgiving Day, December CFL sales experienced a slight increase.



¹² Walmart exceeded their initial MOU allocated budget and sales goal. MOU allocations were modified: Lowe's allocation was adjusted in September 2011 and Walmart's allocation was modified in August, September, November and December 2011.

Figure 3 Expenditures and Number of Bulbs Reported by Month, 2011

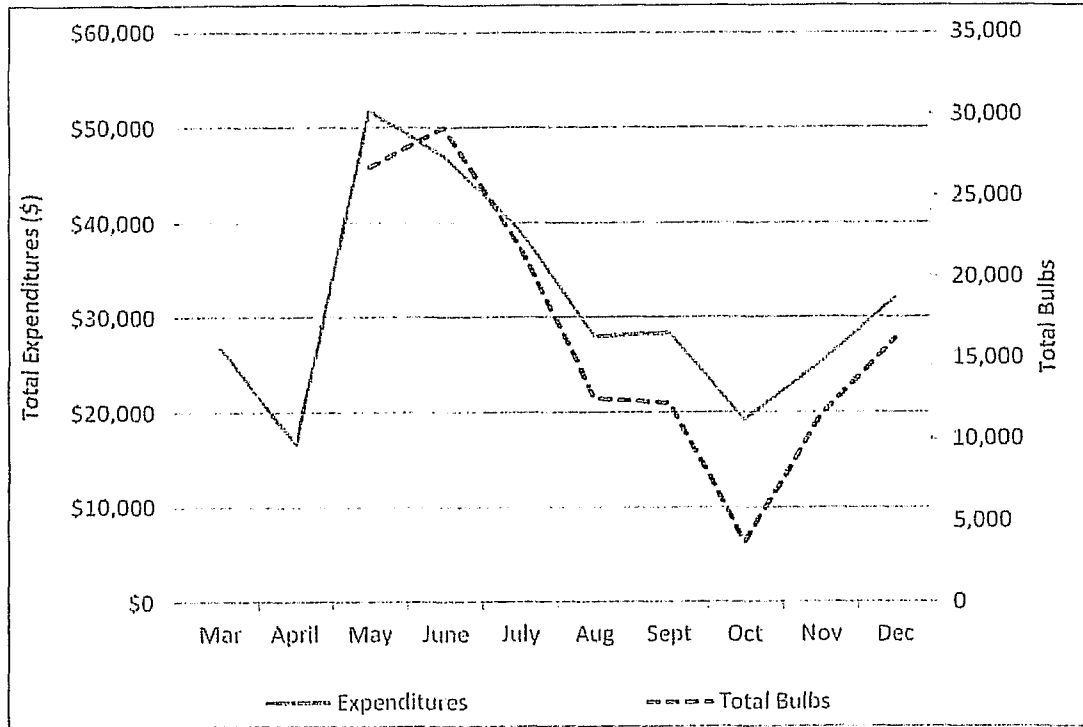


Table 10 presents the original and revised budget and budgeted cost per bulb sold as compared to actual expenditures and actual cost per bulb. Incentives accounted for 43 percent of total actual expenditures, at an average cost of \$1.01 per bulb. The total actual cost of \$2.35 per bulb was slightly less than the budgeted cost of \$2.92 per bulb (as revised in August 2011).

Table 10 2011 Cost per Bulb, Budgeted and Actual

	Original Budget	Revised Budget	Actual
CFL Incentive/Markdown	\$125,000	\$123,735	\$134,375
Other Lighting Incentives	\$4,400	\$20,814	\$0
Admin./Promotion	\$55,000	\$221,327	\$173,712
Evaluation	\$1,000	\$2,000	\$6,068
Total Cost (\$)	\$185,400	\$367,876	\$314,155
Participation	125,800	125,800	133,692
Cost (\$ per Bulb)	\$1.47	\$2.92	\$2.35

5.3 Program Marketing

The Residential Efficient Products Program is marketed under Kentucky Power's GRIDSSMART® Programs. APT and Kentucky Power market the program to residential customers as well as lighting manufacturers and retailers within the KPCO service territory. According to KPCO program staff and APT,

It is very important that customers know Kentucky Power is offering the lighting incentives.

In 2011, marketing activities included:

- **In-Store Materials.** In-store displays include shelf tags and horizontal and vertical beam stands. Customer coupons are prominently displayed at independent retailers.
- **Retailer Site-Visits.** An APT Field Representative within Kentucky Power's service territory conducts weekly visits with MOU retailers to check product stock, displays and product labels and to ensure retail pricing markdowns are current. The representative reviews program details with sales staff and potential program participants.
- **In-Store Activities.** The APT Field Representative periodically promoted the program at the retail stores. The representative set up a table with educational lighting information, a light meter and Kentucky Power DSM Program fact sheets. The representative discussed the program with shoppers, answering questions and demonstrating energy savings.
- **Community Events.** KPCO organized community events in multiple counties, promoting the DSM Programs and distributing program fact sheets. The APT Field Representative supported company sponsored community events by displaying education materials, demonstrating energy savings on a light meter and answering customer questions. The events were advertised in local newspapers and phone promotion to area residents.
- **Internet.** Kentucky Power marketed the program through kentuckypower.com/save. Customers could search an online database for participating retailers and access the KPCO/EFI online store. Kentucky Power offers additional resources on CFL handling and disposal.
- **Retailer Employee Training.** The APT Field Representative provided training to retailer employees on efficient lighting products. Retailers had the option of 17 different training modules.

APT Field Representatives spent one week at APT offices to receive training and educational resources. The representatives were tested prior to performing site visits in order to ensure they demonstrated competency. APT periodically provides training and educational sessions for staff. In 2011, the APT Field Representative participated in 25 promotional events, including in-store promotions and KPCO community events (see Table 11). The representative conducted 384 site visits and trained 3,537 individuals at participating stores, as seen in Figures 4 and 5. Overall, 71 percent of APT Field Representative training took place at Walmart stores, 27 percent at Lowe's stores and 2.3 at the independent retailers.

Participating retailers also promoted the Residential Efficient Products Program. According to the survey results, the Walmart/Lowe's retailers primarily advertised and promoted the program to customers via flyers. Independent retailers made customers aware of the program and displayed coupons both in the lighting aisle and at the register.

Figure 5 APT Field Representative Training by Month, 2011

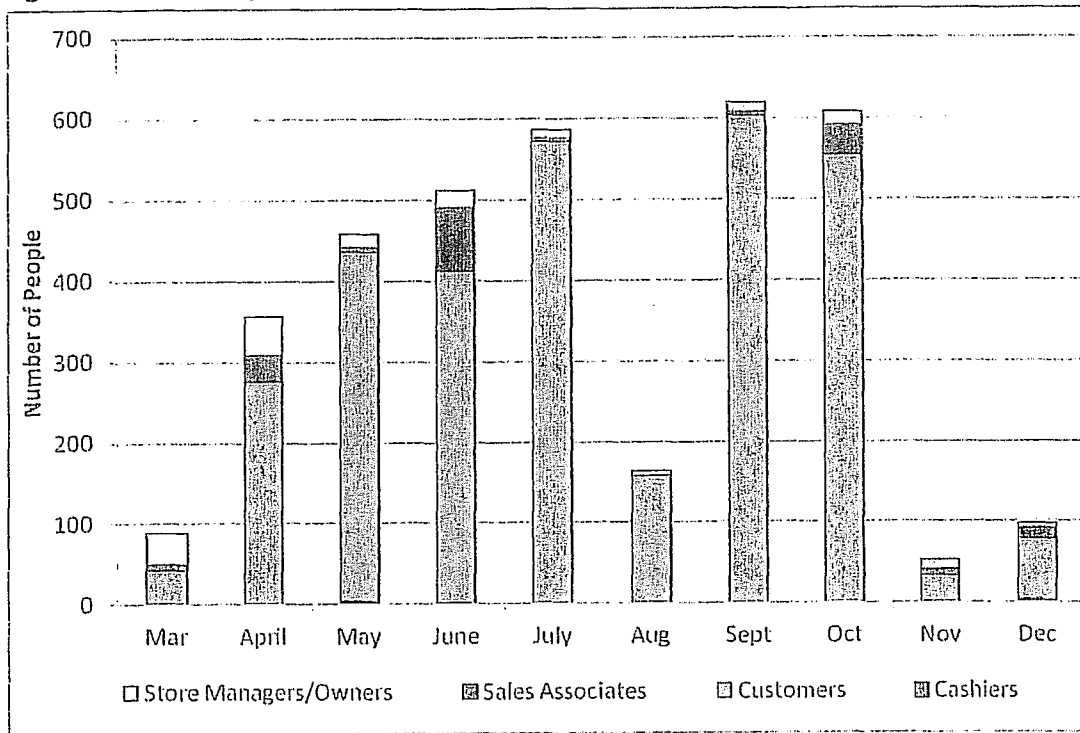
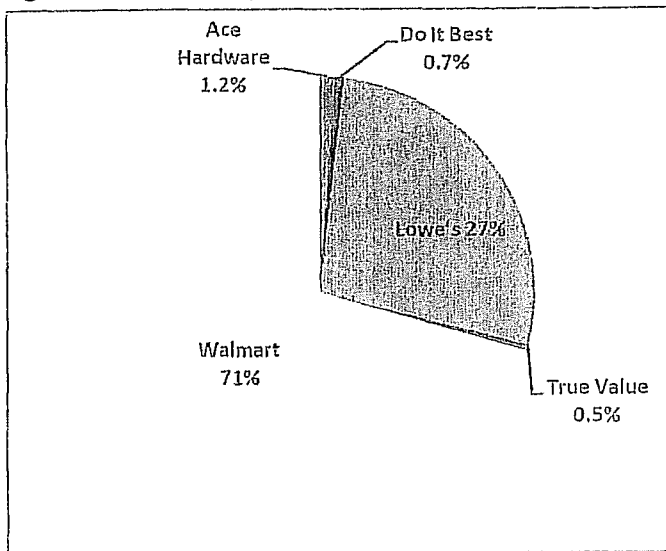


Figure 6 APT Field Representative Training by Retailer, 2011



5.4 Program Tracking & Invoice Processing

Kentucky Power submitted bi-annual reports to the Kentucky PSC with program progress to-date, including participation, estimated energy and demand savings, and budget. The utility reviewed actual, projected and summary program data with the DSM Collaborative on a quarterly basis.

EFI managed and tracked all data and processed manufacturer invoices and customer coupons. Sensitive data could be accessed only by approved EFI staff; APT and Kentucky Power could access non-sensitive data via EFI's web-based portal. APT ensured that retailer sales systems were operated correctly and analyzed sales trends.

Independent retailers submitted the coupons and completed coupon redemption form to EFI. The coupon redemption form included a summary of the coupons by value, the address where the check is to be mailed and the total amount of expected redemption. EFI staff reviewed the redemption form and coupons for completeness and eligibility. Upon approval, an incentive check was mailed to the retailer, reimbursing the retailer for the value of the coupons. The customer coupon included the following information:

- Customer name, address, phone number and email address.
- Model number.
- Manufacturer.
- Number of bulbs in package.
- Wattage.
- Date of purchase.

Manufacturers received KPCO program-related sales data from participating retailers. The manufacturer reviewed the data for completeness and accuracy prior to submitting the data to EFI for processing and payment. The manufacturer often provided the data in a Microsoft Excel format, which was compatible with EFI's tracking system. EFI staff reviewed the sales data for anomalies. EFI submitted unaudited and audited sales data to APT on a bi-weekly basis, frequency varied depending on volume.

APT submitted the unaudited sales data to KPCO as they received them from EFI. APT reviewed the audited sales data and ensured the data matched the manufacturer invoice. An audited invoice, with sales data, and progress report was submitted to Kentucky Power on a monthly basis, often within one or two days of receiving the audited sales data from EFI. The progress report contained APT Field Representative site visit notes, training activities and total sales and incentives by store. Kentucky Power approved the invoice and submitted payment to APT within 10 days of receiving the invoice. APT submitted payment to EFI and EFI submitted payment to the manufacturer/retailer.

The invoicing process took 4 to 6 weeks from the time the manufacturer submitted the sales data to when they received reimbursement from EFI.

The retailer/manufacturer tracked the following data:

- Measure description and model
- Manufacturer
- Wattage
- Quantity: number of bulbs in a pack, number of packs/bulbs, total number of bulbs
- Life of bulbs

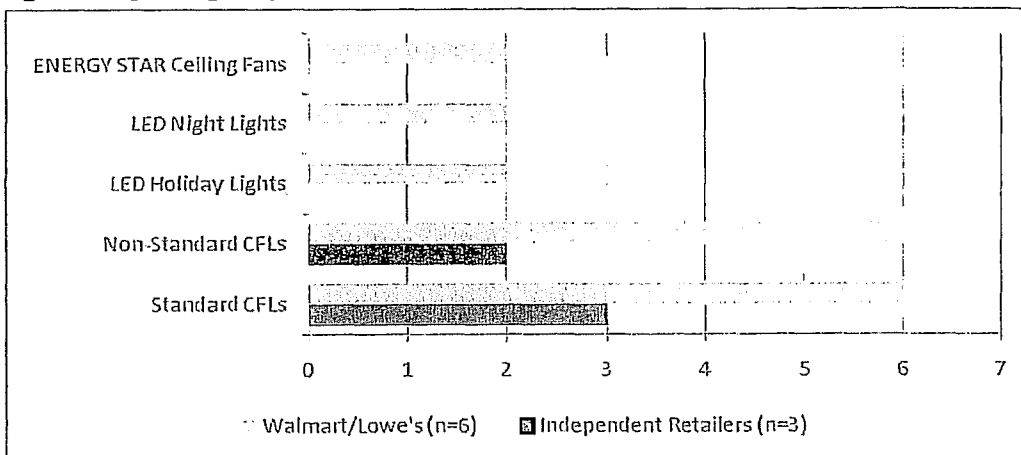
- Retailer name and address
- Total incentive
- Date of sale, invoice submittal and payment
- Retailer/Manufacturer invoice number

5.5 Retailer Interviews

Retailer surveys helped to assess key aspects of the program, including product availability and sales, customer satisfaction and attitudes regarding energy efficiency and conservation, marketing and coordination efforts, educational outreach, program tracking, as well as other support materials provided by KPCO. The retailer surveys also helped identify potential areas for improvement in these areas.

All retailers surveyed stocked qualifying standard CFLs, 66 percent of independent retailers stocked qualifying non-standard CFLs and 33 percent of Walmart/Lowe's retailers surveyed stocked other qualifying lighting products.

Figure 7 Eligible Lighting Stock at Retailer Stores



Approximately half of Walmart/Lowe's retailers and all independent retailers surveyed stocked CFLs prior to participating in the KPCO program. The program influenced the types of CFLs stocked at 66 percent of Walmart/Lowe's and 33 percent of independent retailers surveyed. Walmart/Lowe's retailers noted that CFLs are the best selling lighting product while independent retailers noted that incandescent bulbs are still the best selling product (see Figure 8). One (1) independent retailer stated that while incandescent bulb sales were high, CFLs sales were increasing.

Figure 8 Highest Selling Lighting Products

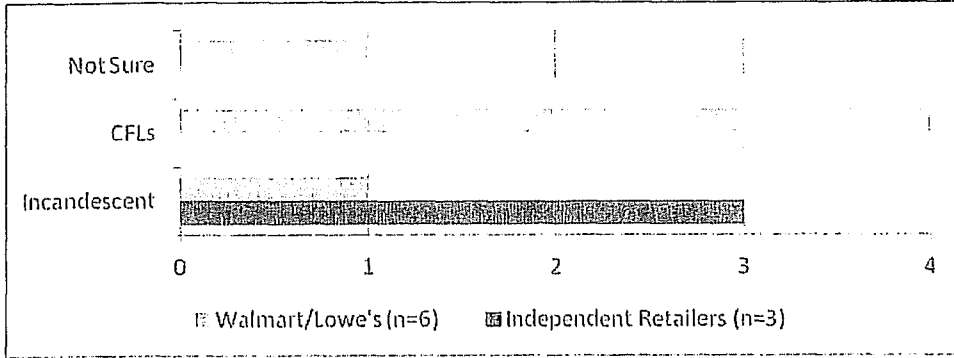
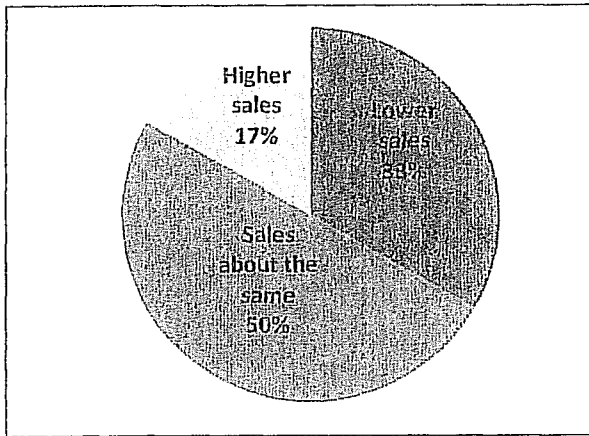


Figure 9 Non-Standard CFLs Sales Compared to Standard CFLs, Walmart/Lowe's Retailers

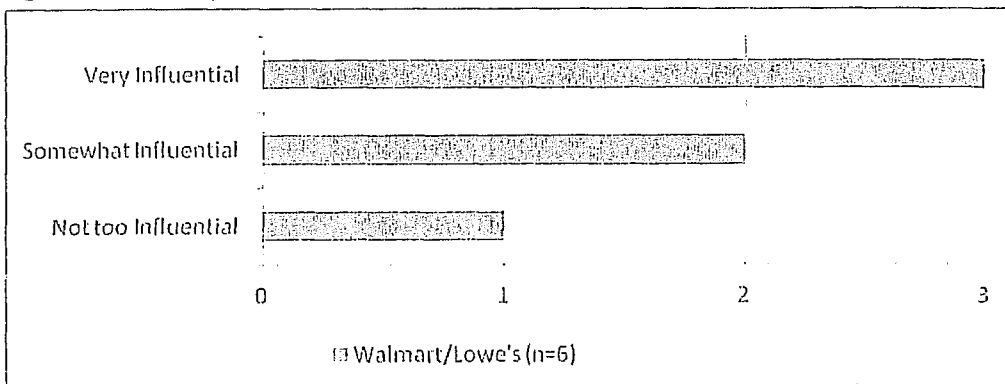


According to Walmart/Lowe's retailers, in the absence of the Kentucky Power incentive:

- The store would have sold as many CFLs (33%).
- The store would have sold the same types of CFLs (66%).

Additionally, 66 percent of Walmart/Lowe's retailers believe that the KPCO program is having an effect on consumer expectations regarding CFL prices.

Figure 10 Kentucky Power Influence in Moving CFL Stock in 2011, Walmart/Lowe's Retailers



Of the 5 independent retailers surveyed, 2 are no longer participating in the Kentucky Power program due to a lack of efficient lighting sales and customer interest in CFLs. According to these 2 retailers,

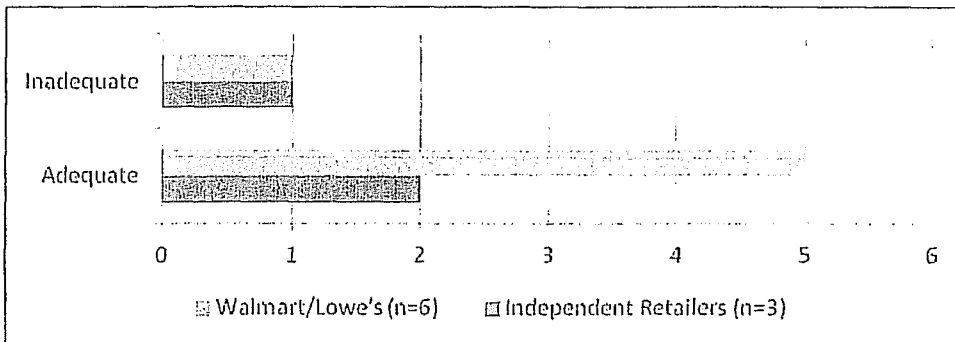
Customers are more interested in purchasing incandescent bulbs than CFLs.

The participating independent retailers surveyed sold efficient lighting products through the Kentucky Power program.

5.6 Opportunities for Improvement

Overall, retailers are very satisfied with the Residential Efficient Products Program. Both Walmart/Lowe's and independent retailers mentioned customer awareness and education as one area that needs improvement. Retailers noted that the APT Field Representative helped to sell CFLs. However, retailer comments called for better education efforts for senior citizens and reducing customer concerns regarding the health and environmental impacts of CFL mercury content. Retailers noted that additional APT Field Representative in-store promotions and Kentucky Power advertising could improve the program.

Figure 11 Adequacy of Kentucky Power Promotional and Education Efforts



Independent retailers did not actively participate in the program in 2011. APT noted that independent retailer participation is consistent with other utility programs. However, APT is working to recruit more small hardware stores and to increase the variety of lighting products available at these stores.

According to APT, hardware stores make up less than 8 percent of lighting market share – the stores cannot competitively price CFLs compared to large stores such as Walmart or Lowe's.

The program has adequate coverage across KPCO service territory. However, APT noted that it is important to keep locally owned retailers in the program as it allowed customers greater access to the program and efficient lighting products.

Currently, APT has no plans to modify the types of lighting products eligible for incentives and has not recommended any program changes. Other products did not perform well in 2011. According to APT:

- LED Holiday Lights and LED Night Lights. The market is already transformed and customers are already purchasing this product.
- ENERGY STAR® Ceiling Fans. Incentives are available only through the KPCO online store. Customer purchases of ceiling fans and fixtures based primarily on aesthetic preferences.

6. Impact Evaluation Findings

Impact evaluations verify the energy and demand savings directly associated with a program and assess the cost-effectiveness of the DSM program.

6.1 Gross Energy and Demand Savings

AEG determined the gross energy and demand savings of a representative sample based on the International Performance Measurement and Verification Protocols (IPMVP) Option A. Option A involves engineering calculations of gross savings using historical data. Engineering calculations referenced from the *New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts. The equation used to determine gross energy impacts is:

$$\text{Gross Energy Impacts} = \text{units} \times \text{leakage} \times \Delta \text{Watts} \times \text{Yearly Operating Hours}$$

$$\text{Gross Demand Impacts} = \text{units} \times \text{leakage} \times \Delta \text{Watts} \times \text{Coincidence Factor}$$

Where:

Units = quantity of bulbs

Leakage = bulbs purchased by non-Kentucky Power customers and bulbs purchased but placed into storage

Δ Watts = wattage difference between efficient bulb installed and standard bulb

Operating Hours = number of hours bulb used per day¹³

Coincidence Factor

Gross impacts were calculated for both standard and non-standard CFL bulbs. The weighted average wattage of a standard CFL bulb purchased through the KPCO program was 18 Watts and a non-standard CFL bulb was 30 Watts. Tables 12 and 13 present the gross savings per bulb and the total energy and demand savings in 2011, respectively.

Table 12 Gross Savings per Unit, 2011

Measure	Summer Peak Savings per Unit (kW)	Winter Peak Savings per Unit (kW)	Energy Savings per Unit (kWh)
Standard CFL (18W)	0.005	0.005	48
Non-Standard CFL (30W)	0.006	0.006	63

¹³ Hourly usage consistent with ENERGY STAR calculator
www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=LB

Table 13 Total Gross Demand and Energy Savings, 2011

Measure	Gross Capacity Savings (kW)	Gross Energy Savings (kWh)
Standard CFL	607	5,989,416
Non-Standard CFL	62	610,361
Program Total	668	6,599,777

6.2 Net Energy and Demand Savings

Net energy and demand savings are the gross savings attributable to the Residential Efficient Products Program, not accounting for impacts resulting from other influences such as free ridership or spillover. Net impacts were calculated by applying a net-to-gross ("NTG") factor to gross impacts.

$$NTG \text{ Ratio} = 1 - \text{Free Ridership} + \text{Spillover}$$

Free ridership and spillover calculations are described in the following subsections. Based on the process evaluation survey results, AEG has determined the net-to-gross ratio for the Residential Efficiency Products Program to be 95 percent. Table 14 presents the 2011 net demand and energy savings achieved.

Table 14 Net Demand and Energy Savings, 2011

Measure	NTG Ratio	Net Capacity Savings (kW)	Net Energy Savings (kWh)
Standard CFL	95%	576	5,689,945
Non-Standard CFL	95%	59	579,843
Program Total		635	6,269,788

6.2.1 Free Ridership

Free ridership estimates the sales of efficient lighting that would have occurred without the Kentucky Power incentive. Three participating retailer questions were designed to determine the portion of a customer's savings that should be attributed to free ridership.

Question 1. How influential have the Kentucky Power incentives been in moving CFL stock in 2011?

The less influential the Kentucky Power incentives were in moving CFL stock, the higher the probability that the customer was a free rider. For example, if a retailer responded 'Not Too Influential,' free ridership probability ranged from 50 to 90 percent.

Question 2. In the absence of the Kentucky Power incentive, do you believe the store would have sold as many CFLs in 2011?

If the store would have sold as many CFLs without the Kentucky Power incentive, there was a high probability that the customer was a free rider. Therefore, if a retailer responded 'Yes,' the probability that the customer was a free rider was higher than if the retailer responded 'No.'

Question 3. Prior to participating in the Kentucky Power program, did your store stock CFLs?

The final question indicated whether the store stocked CFLs prior to participating in the Residential Efficient Products Program. Retailers that stocked CFLs would have a better understanding of the impact of Kentucky Power incentives on CFL sales than retailers that did not stock CFLs.

Each retailer was assigned a value based on the probability that there was free ridership. Table 15 presents the free ridership probability scoring mechanism for Questions 1 and 2.

Table 15 Free Ridership Probability Scores, Questions 1 and 2

Q1 Response	Q2 Response	Min	Max	Estimate
Very influential	No	0%	20%	10%
Very influential	Yes	0%	40%	20%
Somewhat influential	No	30%	50%	40%
Somewhat influential	Yes	40%	60%	50%
Not too influential	No	50%	90%	70%
Not too influential	Yes	70%	90%	80%

The retailer probability from Questions 1 and 2 was adjusted to account for whether CFLs were stocked prior to program participation (Question 3).

- If the retailer stocked CFLs prior to participating, the probability was not altered (0%).
- If the retailer did not stock CFLs prior to participating, the probability was adjusted downward by 25 percent (-25%).

The free ridership probability was bound by 0 percent and 100 percent.

$$\text{Free Ridership} = \text{Question 1\&2} + \text{Question 3}$$

The weighted mean of the retailer probabilities resulted in a free ridership estimate of 22 percent (see Table 16). Therefore, 22 percent of individuals that purchased a CFL through the Residential Efficient Products Program would have purchased the CFL without the KPCO incentive.

Table 16 Free Ridership Weighted Probability

Free Rider Probability	Observations	Weight	Weighted Value
0%	1	0.17	0%
10%	1	0.17	2%
15%	1	0.17	3%
20%	1	0.17	3%
40%	1	0.17	7%
45%	1	0.17	8%
Free Ridership Estimate			22%

6.2.2 Spillover

Spillover estimates the additional sales of efficient lighting that were due to the influence of the Residential Efficient Products Program. Two participating retailer questions were designed to determine the portion of a customer's savings that should be attributed to spillover.

Question 1. Have sales of other non-discounted efficient lighting products increased?

If non-discounted efficient lighting product sales increased, there was participant spillover. Therefore, if a retailer responded 'No,' the probability that there was spillover was 0 percent. If a retailer responded 'Yes,' the probability that there was spillover ranged from 0 to 70 percent.

Question 2. What influence do you think the Kentucky Power program had on these sales?

The greater the influence that the Kentucky Power program had on non-discounted lighting product sales, the higher the participant spillover. For example, if a retailer responded that the KPCO program 'Had a Large Influence,' then spillover probability ranged from 50 to 70 percent.

Each retailer was assigned a value based on the probability that there was spillover. Table 17 presents the spillover probability scoring mechanism.

Table 17 Spillover Probability Scores, Questions 1 and 2

Q1 Response	Q2 Response	Min	Max	Estimate
No		0%	0%	0%
Yes	Had no influence	0%	20%	10%
Yes	Had some influence	20%	40%	30%
Yes	Had a large influence	50%	70%	60%

The weighted mean of retailer probabilities resulted in a spillover estimate of 17 percent. Therefore, 17 percent of individuals that participated in the Residential Efficient Products Program purchased additional efficient lighting due to the influence of the KPCO program.

Table 18 Spillover Weighted Probability

Spillover Probability	Observations	Weight	Weighted Value
0%	3	0.50	0%
10%	1	0.17	2%
30%	1	0.17	5%
60%	1	0.17	10%
Spillover Estimate			17%

6.3 Program Cost-Effectiveness

Cost-effectiveness analysis compares the costs and benefits of efficient equipment with those of baseline (non-efficient) equipment. Cost-effectiveness analysis indicates whether the efficient technology(s) improve a customer's financial position, decrease overall energy costs to ratepayers, or raise society's well-being. A program is considered cost-effective if the benefit-cost ratio is greater than one (1.0).

AEG analyzed the cost-effectiveness of the Residential Efficient Products Program utilizing four standard cost-effectiveness tests taken from the California Standard Practices Manual.¹⁴ Each test analyzes cost-effectiveness from a different perspective and answering a separate question:

- Participant Cost Test: Compares customer costs and benefits of installing the measure. Will the participant benefit over the life of the measure?
- Program Administrator Cost Test (Utility Cost Test): Comparison of program administrator costs to supply-side resource benefits. Will utility costs to save energy be less than utility costs to deliver the same amount of energy?
- Ratepayer Impact Measure: Measures the impact of the DSM program on utility rates if rates were to be adjusted to account for the program. Comparison of utility program costs and bill reductions associated with energy savings to supply-side resource benefits. Will customer rates increase?
- Total Resource Cost Test: Comparison of program administrator and customer costs to utility resource savings. Will the total costs of energy in the utility service territory decrease?

Results from the impact evaluation, utilizing IPMVP best practices, are utilized in the four cost-effectiveness tests taken from the California Standard Practices Manual.

A typical CFL bulb has an average life of 7 to 9 years.¹⁵ However, national lighting efficiency standards are being increased according to the Energy Independence and Security Act of 2007. AEG utilized an average bulb life of 5 years for the cost-effectiveness analysis to account for the increasing lighting efficiency requirement in future years. The 5 year lifetime infers that the baseline wattage will be equivalent to standard CFLs in future years.

Kentucky Power specific inputs, including avoided costs, discounts rates, participation and incentives, were used to conduct the cost-effectiveness analysis. Bencost, an updated version of a public domain model that AEG customized for Kentucky Power, was utilized to perform the cost-effectiveness modeling (see Appendix C). Bencost is an input-output model that calculates all four cost-effectiveness tests. All program costs and benefits are discounted to present-day dollar values in order to accurately compare future benefits with current costs.

Table 19 Cost-Effectiveness Results

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Ratepayer Impact Measure Test	0.45	\$2,977,088	\$1,341,838	-\$1,635,251
Utility Cost Test	4.22	\$318,344	\$1,341,838	\$1,023,494
Participant Cost Test	6.02	\$382,523	\$2,301,064	\$1,918,542
Total Resource Cost Test	2.39	\$562,303	\$1,341,838	\$779,535

¹⁴ The California Standard Practices Manual details cost-effectiveness guidelines and procedures for standardized cost-effectiveness evaluations.

¹⁵ See www.energystar.gov/index.cfm?fuseaction=flnd_a_product.showProductGroup&pgw_code=LB

The Residential Efficient Products Program is the main driver for the cost-effectiveness of the entire Kentucky Power portfolio being cost-effective in 2011. Table 20 provides the cost-effectiveness for the 2010-2012 Demand Side Management Program Portfolio being evaluated by AEG.¹⁶

Table 20 Kentucky Power Portfolio Cost-Effectiveness Results, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	2.13	\$720,104	\$1,533,730	\$813,626
Ratepayer Impact Measure Test	0.44	\$3,507,956	\$1,533,730	-\$1,974,227
Participant Test	5.13	\$486,703	\$2,499,101	\$2,012,397
Total Resource Cost Test	1.57	\$975,217	\$1,533,730	\$558,512

7. Key Findings and Recommendations

7.1 Key Program Findings

The goal of the Residential Efficient Products Program is to produce long-term energy savings in the residential sector by increasing the market share (sales) of ENERGY STAR® CFLs and other ENERGY STAR® lighting products sold through retail sales channels.

7.1.1 Program Performance Indicators

In 2011, 13 participating retailers sold 133,692 CFLs, exceeding the overall program goal of 125,800 bulbs. Ninety-three (93) percent of sales were standard CFLs and the remaining 7 percent were non-standard CFLs. Walmart accounted for 89 percent of all sales and Lowe's accounted for 11 percent of all sales. According to APT, independent retailers did not submit any coupons for reimbursement. Incentives accounted for 43 percent of total actual expenditures, at an average cost of \$1.01 per bulb. The total actual cost of \$2.35 per bulb was slightly less than the budgeted cost of \$2.92 per bulb (as revised in August 2011).

Table 21 Participation Goal versus Sales, 2011

	Goal	Sales
CFLs	125,000	133,692
ENERGY STAR Ceiling Fans	200	-
LED Products	600	-
Total	125,800	133,692

Although the program was successful in promoting CFL sales, there were no sales of ENERGY STAR® ceiling fans and LED products. APT noted that the residential market for LED holiday lights and LED night lights has already transformed and does not require incentives. Additionally, customer purchases of ceiling fans and fixtures are based primarily on aesthetic preferences.

¹⁶ The 2010-2012 DSM Program Portfolio includes the Small Commercial Heat Pump/Air Conditioner Program, Residential Efficient Products Program, Commercial Incentive Program, and Residential and Small Commercial HVAC Diagnostic and Tune-Up Program.

Walmart/Lowe's retailers noted that CFLs are the best selling lighting product while independent retailers noted that incandescent bulbs are still the best selling product. According to APT, the independent retailers comprise less than 8 percent of the lighting market and have difficulty competitively pricing CFLs compared to large stores such as Walmart or Lowe's.

7.1.2 Program Tracking

Program data is managed and tracked by EFI and APT. The program tracking and monitoring systems accurately track program data and process invoices. On average, the invoicing process took 4 to 6 weeks from the time the manufacturer submitted the sales data to when they received reimbursement from EFI.

7.1.3 Program Awareness and Marketing Strategies

APT and Kentucky Power marketed the program to residential customers as well as lighting manufacturers and retailers within the KPCO service territory. In 2011, the APT Field Representative participated in 25 promotional events, including in-store promotions and KPCO community events, conducted 384 site visits and trained 3,537 individuals at participating stores. Seventy-one (71) percent of APT Field Representative training took place at Walmart stores, compared to 27 percent at Lowe's stores and 2.3 percent at the independent retailers.

7.1.4 Best Practices

Kentucky Power's program design and processes are largely consistent with best practices for similar energy efficiency programs. Eighty-five (85) percent of energy efficiency programs targeted at residential customers provide incentives for compact fluorescent lighting.¹⁷ Incentives for residential lighting typically range between \$0.50 and \$3.50 for CFLs, \$10 and \$30 for LED Bulbs, and \$15 and \$25 for ceiling fans. Depending on the design of the program, these incentives are typically point-of-sale discounts, mail-in rebates or instant rebates.¹⁸

Challenges posed by lack of information are ubiquitous in energy efficiency programs. Investment in education and outreach boosts awareness of the potential benefits of energy efficiency. Successful marketing strategies can increase program participation, increase energy savings and enable the delivery of more sophisticated energy efficient programs. Achieving maximum benefits from energy efficiency programs requires establishing clearly defined goals that are linked to overall program objectives as well as modifying the program over time.¹⁹

7.1.5 Verification and Documentation of Program Impacts

Based on the participating retailer survey results, free ridership is estimated at 22 percent and spillover at 17 percent. Therefore, the net-to gross ratio for the Residential Efficiency Products Program is 95%.

¹⁷ Consortium for Energy Efficiency (2012). State of the Efficiency Program Industry: Budgets, Expenditures and Impacts 2011.

¹⁸ ICF International. ENERGY STAR Summary of Lighting Programs, October 2011 Update.

¹⁹ National Action Plan for Energy Efficiency (2010). *Customer Incentives for Energy Efficiency Through Program Offerings*. Prepared by William Prindle, ICF International, Inc. <www.epa.gov/eeactionplan>

Table 22 2011 CFL Bulb Savings by Type

Measure	Gross Peak Savings (kWh)	Gross Energy Savings (kWh)	NRG Ratio	Net Peak Savings (kWh)	Net Energy Savings (kWh)	TRC
Standard CFL	607	5,989,416	95%	576	5,689,945	2.37
Non-Standard CFL	62	610,361	95%	59	579,843	2.55
Program Total	668	6,599,777		635	6,269,788	2.39

7.2 Recommendations

AEG has several recommendations on how to improve the program. These include:

7.2.1 Engage Independent Retailers and Reduce Barriers to Entry

AEG recommends that Kentucky Power work with APT to engage independent retailers and reduce barriers to entry. Independent retailers comprise less than 8 percent of the lighting market and cannot competitively price CFLs compared to large stores such as Walmart or Lowe's. Nevertheless, it is important to keep independent retailers in the program as it allows customers greater access to the program and efficient lighting products.

Two barriers to entry for independent retailers include:

- o Lack of in-store promotions and staff training. The APT Field Representative did not actively engage independent retailers, with 1 in-store promotion and 2.3 percent of training, despite APT's attempts to recruit additional independent retailers. The Field Representative should conduct more frequent in-store promotions for these retailers.
- o Participant data requirements. Current in-store instant coupons require independent retailers to collect customer name, address and telephone, while Walmart and Lowe's stores collect only product information. Collection of customer data is a barrier to participation for independent retailers that Walmart and Lowe's stores are not subject to. As with the Walmart and Lowe's stores, the independent retailers are located within KPCO territory. Therefore, AEG recommends that the in-store instant coupons be modified to collect only the product information that Walmart/Lowe's stores collect.

Addressing these barriers to entry is necessary to increase participation among independent retailers. Any decision to increase engagement with independent retailers could affect the program's cost-effectiveness. If the program goal is to reduce overall energy consumption at the lowest cost, then the program should encourage large scale retailer participation. Engaging independent retailers at multiple locations would broaden the geographic reach of the program, which corresponds to the current program goal.

7.2.2 Review Product Offerings

AEG recommends that Kentucky Power review the current program offerings and examine the cost-effectiveness of incentivizing additional lighting measures.

- o Remove incentives for LED holiday lights, LED nightlights and ENERGY STAR ceiling fans. Kentucky Power did not achieve any sales of LED nightlights, LED holiday lights and ENERGY

STAR ceiling fans. Additionally, APT noted that the market for LED holiday lights and LED night lights has already transformed and purchases of ceiling fans are based on aesthetic preferences.

- Establish separate goals for standard and non-standard CFLs. Establishing goals will allow Kentucky Power to determine the progress of the program in terms of achieving participation goals and remaining within the budget. Program progress will influence future program design (e.g. 2011 program participation goals were exceeded, therefore Kentucky Power could increase 2012/2013 participation goals).
- Examine the cost-effectiveness of incentivizing LED bulbs, the next step in efficient lighting. The LED bulb market is maturing and costs are decreasing. AEG recommends that KPCO work with APT to determine which LED bulbs should be evaluated, the incentive levels and the participation goals.

AEG recommends that the incentive levels for the standard and non-standard CFLs remain the same through 2012, at which point the program should be reexamined. Incentives may be decreased slightly depending upon achievement of participation goals and other product offerings. Potential participation goals for consideration include 150,000 standard CFLs and 25,000 non-standard CFLs, to be adjusted based upon APT input, program performance and other product offerings.

AEG recommends that KPCO consider examining the cost-effectiveness of incentivizing other residential products. KPCO should work with APT to determine which products, such as smart strips or ENERGY STAR® refrigerators, should be evaluated, the incentive levels and the participation goals. Any decision to incorporate additional products into the program portfolio could affect the program's cost-effectiveness. In addition to cost-effectiveness, KPCO should consider the customer benefit of incorporating the additional products and the potential energy savings.

7.2.3 Increase Marketing and Promotional Activities

AEG recommends that Kentucky Power continue current marketing and promotional activities, particularly the APT Field Representative in-store promotions and staff training. Marketing materials, such as program fact sheets or handouts, should include education information to reduce customer concerns regarding the health and environmental impacts of CFL mercury content.

AEG recommends an increase in marketing and promotional activities for independent retailers, including APT Field Representative in-store promotions, in-store signage and potentially short-term cooperative marketing.

Appendix A. Walmart/Lowe's Retailer Survey

Hello, may I speak with _____.

If they are unavailable, "Is a manager in the lighting department available?"

If no one is available, ask to have someone call you back (732-447-1367) during the hours you are working that day.

Hello, I'm _____. Kentucky Power is conducting an evaluation of its Residential Efficient Products Program. Your store has participated in the program over the last year by stocking and selling CFL's and I'd like to ask you a few questions about how things are going.

This is NOT a sales call, but for research purposes only. The survey should take about 10 minutes, and all comments will remain confidential.

Product Mix / Free-Ridership

1. What lighting products sold at your store are eligible for a Kentucky Power incentive? (DO NOT READ)
 - a) Standard CFLs (6)
 - b) Non-Standard CFLs (6)
 - c) LED Holiday lights (2)
 - d) LED night lights (2)
 - e) ENERGY STAR ceiling fans (2)
2. Prior to participating in the Kentucky Power program, did your store stock CFLs?
 - a) Yes (3)
 - b) No (3)
3. Did the Kentucky Power program have an influence on the types of CFLs stocked?
 - a) Yes (4)
 - b) No (2)
4. In general, what types of lighting products sell best in your store?
 - a) Incandescent (1)
 - b) CFLs (4)
 - c) Not Sure (1)
5. How well are CFLs selling compared to incandescent bulbs?
 - a) Sales are lower
 - b) Sales are about the same
 - c) Sales are higher (6)
6. Does your store stock both standard (bare spiral) and non-standard CFLs?
 - a) Yes (continue) (6)
 - b) No (go to Q8)
7. How well are non-standard CFLs selling compared to standard CFLs?
 - a) Sales are lower (2)
 - b) Sales are about the same (3)
 - c) Sales are higher (1)
8. How influential have the Kentucky Power incentives been in moving CFL stock in 2011?
 - a) Very Influential (1)
 - b) Somewhat Influential (2)

- c) Not Too Influential **(3)**
 - d) Not At All Influential
 - e) Don't Know (DO NOT READ)
 - f) Other (please specify)
9. In the absence of the Kentucky Power incentive, do you believe the store would have sold as many CFLs in 2011?
- a) Yes **(4)**
 - b) No **(2)**
10. In the absence of the Kentucky Power incentive, do you believe the store would have sold the SAME TYPES of CFLs in 2011?
- a) Yes **(N/A)**
 - b) No **(N/A)**

Spillover

11. Have sales of other non-discounted efficient lighting products increased?
- a) Yes **(3)**
 - b) No **(3)**
12. What influence do you think the Kentucky Power program had on these sales?
- a) Had no influence **(2)**
 - b) Had some influence **(2)**
 - c) Had a large influence **(2)**
13. Do you think the Kentucky Power program is having an effect on consumer expectations regarding CFL prices?
- a) Yes **(4)**
 - b) No **(2)**
 - c) Other

Marketing and Education

14. Do you think the Kentucky Power promotional and education efforts are adequate?
- a. Yes (skip to Q16) **(5)**
 - b. No (continue) **(1)**
15. What would you change?
- Education could be better*
- There was nothing I would change. The representative really helped sell the bulb.*
16. Did your store advertise or promote the Kentucky Power program (i.e. print ads, signage)?
- a) Yes (continue) **(6)**
 - b) No (skip to Q18)
17. What type of advertising/promotion?
- Flyers, index cards, sticky things that are on shelves, AEP guy set up a booth one time to spread awareness.*
- Flyers/Signs*
- More demos*
18. Would you recommend any changes to improve consumer education about CFLs?
- a) Yes **(3)**
 - b) No **(1)**

c) N/A (2)

"I think there needs to be more info put out there, I'm not sure on how you would do that but, the community around his has a lot of older people so you have to explain it slowly."

"That they can throw them away because there is not as much mercury in them as compared to a regular light bulb."

"More demos"

Sales Data

19. What type of sales information do you provide to Kentucky Power?

Usually the representative will come around with his own information and I will give him the sales sheet as well.

The forms from the sales.

Don't know. Corporate takes care of that.

Cost Savings/ Usage Savings

Not sure.

Not sure - the representative that comes in would know better.

20. How often do you provide the data? (N/A)

Every once in a while, sometimes he talks to others so I don't always see him.

The manger could tell you better but I believe every few weeks.

"As often as we can"

The representative comes in once a week. I assume he provides the data he collects.

21. Is there anything that might improve the data collection process?

No (4)

Thank you for taking the time to answer my questions.

Appendix B. Independent Retailer Survey

Hello, may I speak with _____.

If they are unavailable, "Is a manager or sales associate available?"

If no one is available, ask to have someone call you back (732-447-1367) during the hours you are working that day.

Hello, I'm _____. Kentucky Power is conducting an evaluation of its Residential Efficient Products Program. Your store has participated in the program over the last year by stocking and selling CFL's and I'd like to ask you a few questions about how things are going.

This is NOT a sales call, but for research purposes only. The survey should take about 10 minutes, and all comments will remain confidential.

Product Mix:

1. What lighting products sold at your store are eligible for a Kentucky Power incentive? (DO NOT READ)
 - a) Standard CFLs **(3)**
 - b) Non-Standard CFLs **(2)**
 - c) LED Holiday lights **(0)**
 - d) LED night lights **(0)**
 - e) ENERGY STAR ceiling fans **(0)**
2. Prior to participating in the Kentucky Power program, did your store stock CFLs?
 - a) Yes **(3)**
 - b) No **(0)**
3. Did the Kentucky Power program have an influence on the types of CFLs stocked?
 - a) Yes **(1)**
 - b) No **(2)**
4. In general, what types of lighting products sell best in your store?
 - a) Incandescent **(3)**
 - b) CFLs **(0)**
 - c) Not Sure **(0)**
5. How well are CFLs selling compared to incandescent bulbs?
 - a) Sales are lower **(3)**
 - b) Sales are about the same **(0)**
 - c) Sales are higher **(0)**
6. Does your store stock both standard (bare spiral) and non-standard CFLs?
 - a) Yes **(3)**
 - b) No **(0)**
7. Have you sold any efficient lighting products through the Kentucky Power program?
 - a) Yes **(3)**
 - b) No **(0)**
8. Have you submitted any coupons for reimbursement?
 - a) Yes (continue) **(2)**
 - b) No (skip to Q10) **(1)**

9. How long did it take to be reimbursed, from the time you submitted the paperwork until you received the incentive? CONTINUE TO QUESTION 11

- a) Less than 2 weeks (1)
- b) 2 to 4 weeks
- c) 4 to 8 weeks
- d) Greater than 8 weeks
- e) Don't Know (DO NOT READ) (1)
- f) Other

10. Why have you not submitted the coupons for reimbursement?

Let the customer, submit the coupons.

No longer participating in the program, wasn't worth it. Had put up all of the signs and promoted the program, but customers were more interested in purchasing incandescent bulbs. Very few CFLs sold. Bill inserts may help participation.

11. Do you expect to submit any coupons in 2012?

Yes, if more people start buying the CFL's, most people just stock up on the incandescents.

Program Participation

12. Where are the Kentucky Power coupons located in your store?

- a) Lighting Aisle (2)
- b) Register (2)
- c) Other

13. Do you make customers aware of the Kentucky Power coupon incentive?

- a) Yes (3)
- b) No

14. Do you verify that the customer is a Kentucky Power electric customer?

- a) Yes (continue)
- b) No (skip to Q14) (3)

15. How could the program be improved?

*It's work well for me so far, no suggestions.
More advertising.*

Marketing and Education

16. Do you think the Kentucky Power promotional and education efforts are adequate?

- a. Yes (skip to Q18) (2)
- b. No (continue) (1)

17. What would you change?

More awareness of the program.

18. Did your store advertise or promote the Kentucky Power program (i.e. print ads, signage)?

- a) Yes (continue)
- b) No (skip to Q19) (3)

19. What type of advertising/promotion?

Word of mouth from customers.

20. Would you recommend any changes to improve consumer education about CFLs?

No (3)

Thank you for taking the time to answer my questions.

Appendix C. Cost-Effectiveness Analysis Inputs

Table C1: General Bencost Model KPCO Rate Inputs

BENEFIT COST TEST FOR CONSERVATION PROGRAMS -- Cost-Effectiveness Analysis			
Company:		Kentucky Power Company	
General Inputs			
Input Data			Source
Electric Retail Rate (\$/kWh) =		\$0.08599 Residential	Kentucky Power Cost & Rate
		\$0.07402 Commercial	
		\$0.08001 All Classes	
Variable O&M (\$/kWh) =		\$0.00000	3.00%
		Escalation Rate =	
Environmental Damage Factor		\$0.0097	3.00%
		Escalation Rate =	
Participant Discount Rate =		15.00%	KPCO Data Request from AEP Load Research
Utility Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
Social Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
General Input Data Year =		2011	
Project Analysis Year 1 =		2011	
Residential and Small Commercial Energy Losses		8.7%	KPCO email dated 4/20/12 from Alan Graves
Residential and Small Commercial Peak Losses		10.7%	KPCO email dated 4/20/12 from Alan Graves

Table C2: Bencost Model Commodity Cost Inputs²⁰

Year	Avoided Energy Commodity Costs (\$/MWh)	Avoided Capacity Costs (\$/KW-year)	Avoided Electric Retail Rates (\$/MWh)
2011	\$0.0395	\$40.15	\$0.080
2012	\$0.0403	\$6.01	\$0.080
2013	\$0.0399	\$10.12	\$0.082
2014	\$0.0432	\$45.99	\$0.084
2015	\$0.0447	\$124.83	\$0.086
2016	\$0.0510	\$124.83	\$0.088
2017	\$0.0520	\$69.30	\$0.090
2018	\$0.0528	\$80.15	\$0.092
2019	\$0.0540	\$89.71	\$0.094
2020	\$0.0547	\$97.91	\$0.096
2021	\$0.0561	\$104.70	\$0.098
2022	\$0.0658	\$110.03	\$0.100
2023	\$0.0670	\$113.83	\$0.103
2024	\$0.0691	\$116.04	\$0.105
2025	\$0.0707	\$118.13	\$0.108
2026	\$0.0716	\$120.25	\$0.110
2027	\$0.0731	\$122.42	\$0.113
2028	\$0.0746	\$124.62	\$0.115
2029	\$0.0761	\$126.86	\$0.118
2030	\$0.0779	\$129.15	\$0.120
2031	\$0.0788	\$130.70	\$0.123
2032	\$0.0788	\$132.26	\$0.126
2033	\$0.0788	\$133.85	\$0.129
2034	\$0.0788	\$135.46	\$0.132
2035	\$0.0788	\$137.08	\$0.135

²⁰ Avoided cost inputs provided by Kentucky Power (AEP) Load Forecasting Group through a data request.

TABLE C3: BENCOST MODEL INPUTS

General Inputs	Specific Project Inputs
Retail Rate (\$/kWh)	Utility Project Costs (\$)
Non-Electric Fuel Retail Rate (\$/Fuel Unit)	Administrative Costs (\$)
Commodity Cost (\$/kWh)	Incentive Costs (\$)
Demand Cost (\$/kW/Yr)	Total Utility Project Costs (\$)
Peak Reduction Factor (%)	Direct Participant Project Costs (\$/Participant)
Variable O&M (\$/kWh)	Participant Non-Energy Costs (Annual \$/Part)
Non-Electric Fuel Cost (\$/Fuel Unit)	Participant Non-Energy Savings (Annual \$/Part)
Non-Electric Fuel Loss Factor	Project Life (Years)
Electric Environmental Damage Factor (\$/kWh)	Avg. kWh/Participant Saved
Participant Discount Rate (%)	Avg. Non-Electric Fuel Units/Part. Saved
Utility Discount Rate (%)	Avg. Additional Non-Electric Fuel Units/Part. Saved
Societal Discount Rate (%)	Number of Participants
General Input Data Year	Total Annual kWh Saved
Project Analysis Year	Incentive/Participant
Growth and Escalation Factors (%)	

TABLE C4: BENCOST MODEL OUTPUTS

General Outputs	Benefit-Cost Outputs (Part 1)
Coincident Utility Peak Demand Reduction	Net Present Value of Benefits - Costs
Annual Utility Energy Reduction	Benefit-Cost Ratio
Total Utility Demand Reduction	Total Benefits
Total Utility Energy Reduction	Total Costs
Levelized Costs per kWh	
Levelized Costs per kW	
Annual Participant Savings	
Simple Payback	



Kentucky Power Company
Small Commercial Heat
Pump/Air Conditioner
Incentive Program
Process, Market and Impact Evaluation · July 2012

Submitted by

Applied Energy Group, Inc
1377 Motor Parkway, Suite 401 · Islandia, NY 11749
Tel (631) 434-1414 · Fax (631) 434-1212
www.appliedenergygroup.com

Abstract

Kentucky Power Company retained Applied Energy Group to conduct a process, market and impact evaluation of its Small Commercial Heat Pump/ Air Conditioner Incentive Program. The program offers small commercial (less than 100 kW) financial incentives for upgrading to a new qualifying central air conditioner or heat pump system, up to a 5 ton unit.

To arrive at the final recommendations of the evaluation, AEG reviewed program materials, assessed Kentucky Power's program tracking and conducted interviews with Kentucky Power program staff, participating customers and participating HVAC dealers. The results of the analysis, along with key findings and recommendations for program improvements, are included in this report.

Table of Contents

Abbreviations	i
Definitions	ii
Executive Summary	iv
1. Introduction.....	1
2. Program Description	1
3. Evaluation Methodology	3
4. Process and Market Evaluation Findings.....	6
4.1 Program Logic Model	6
4.1.1 Activities and Outputs	8
4.1.2 Outcomes	9
4.1.3 External Factors.....	10
4.1.4 Best Practices	10
4.2 Program Performance	10
4.3 Program Marketing	14
4.3.1 Program Awareness	15
4.3.2 Motivation for Participation.....	16
4.4 Program Tracking & Incentive Processing.....	17
4.5 Program Satisfaction	18
4.5.1 Participating Customer Satisfaction	18
4.5.2 Participating Dealer Satisfaction	20
5. Impact Evaluation Findings	22
5.1 Gross Energy and Demand Savings	22
5.2 Net Energy and Demand Savings	24
5.3 Program Site Inspections and Installation Verification	24
5.4 Program Cost-Effectiveness	25
6. Key Findings and Recommendations	27
6.1 Summary of Key Findings	27
6.1.1 Program Performance Indicators.....	27
6.1.2 Program Tracking	28
6.1.3 Program Awareness and Marketing Strategies.....	28
6.1.4 Best Practices	28
6.1.5 Verify Program Impacts.....	29
6.2 Recommendations	29
6.2.1 Hire Implementation Contractor.....	29
6.2.2 Program Modifications.....	30
6.2.3 Engage Participating HVAC Dealers.....	30
Appendix A. Participating Dealer Survey Guide (a).....	32
Appendix B. Participating Dealer Survey Guide (b).....	35
Appendix C. Participating Customer Survey Guide	37
Appendix D. Cost-Effectiveness Analysis Inputs.....	41

List of Tables

Table ES1 2011 Program Participation, Actual and Goals.....	v
Table ES2 Energy Savings, 2011	vi
Table 1 HVAC System Incentive Levels.....	2
Table 2 Detailed Program Budget, 2010-2012	2
Table 3 Program Participation Goals, 2010-2012	2
Table 4 Anticipated Energy and Demand Savings per Participant	3
Table 5 Overview of IPMVP Options	5
Table 6 Program Participation, 2011.....	11
Table 7 HVAC Installations by System Type and Size, 2011	11
Table 8 2011 Cost per Participant, Budgeted and Actual	12
Table 9 Consortium for Energy Efficiency Commercial HVAC Tier 1 Guidelines.....	13
Table 10 Most Active Participating HVAC Dealers	14
Table 11 Gross Savings per Unit, 2011.....	23
Table 12 Total Gross Demand and Energy Savings, 2011	23
Table 13 Net Demand and Energy Savings per Unit, 2011.....	24
Table 14 Installation Verification Site Visits, 2011	25
Table 15 Cost-Effectiveness Results, 2011	26
Table 16 Cost-Effectiveness Results if Planned Participation Achieved, 2011.....	26
Table 17 Kentucky Power Portfolio Cost-Effectiveness Results, 2011.....	27
Table 18 2011 Program Participation, Actual and Goals.....	27
Table 19 Energy Savings, 2011	29

List of Figures

Figure 1 Program Logic Model	7
Figure 2 Length of Time between Submitting Application and Receiving Rebate Check, n=13	9
Figure 3 HVAC Installations by System Type, 2011	11
Figure 4 HVAC Systems Rebated Monthly by System Type, 2011	12
Figure 5 Newspaper Advertisement.....	15
Figure 6 How Customers First Learned of the Program, n=13	15
Figure 7 How Participating HVAC Dealers First Learned of the Program.....	16
Figure 8 Customer Motivation for Participation, n=13	16
Figure 9 Reasons Participants Would Recommend the Contractor, n=13.....	18
Figure 10 Reasons Participant Would Recommend the Program, n=13	19
Figure 11 Participant Satisfaction with the Program, n=13	19
Figure 12 Participant Suggestions for Program Improvement, n=13.....	20
Figure 13 Likelihood of Non-Participating HVAC Dealer Submitting Rebate in 2012, n=8	21
Figure 14 Participating HVAC Dealer Preferred Contact Medium, n=7	21
Figure 15 Participating HVAC Dealer Satisfaction with the Program, n=7	22

Abbreviations

AEG	Applied Energy Group, Inc.
AEP	American Electric Power
CAC	Central Air Conditioner
CEE	Consortium for Energy Efficiency
EER	Energy Efficiency Ratio
EFLH	Equivalent Full Load Hours
EM&V	Evaluation Measurement and Verification
DSM	Demand Side Management
HP	Heat Pump
HSPF	Heating Season Performance Factor
HVAC	Heating Ventilation & Air Conditioning
IPMVP	International Performance Measurement and Verification Protocols
KPCO	Kentucky Power Company
NTG	Net-To-Gross Ratio
PSC	Public Service Commission
QA/QC	Quality Assurance/Quality Control
SEER	Seasonal Energy Efficiency Ratio

Definitions

Benefit-Cost Ratio: The ratio of total benefits of a program to the total costs discounted over some specified time period. The benefit-cost ratio gives a rough measure of the participant rate of return and provides an indicator of program risk. A ratio above one indicates a beneficial program.

Participant Cost Test: Measures the quantifiable benefits and costs to the customer due to participation in a program.

Program Administrator Cost Test: Measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs), excluding any net costs incurred by the participant. The benefits are similar to the Total Resource Cost benefits, but costs are more narrowly defined.

Ratepayer Impact Measure (RIM) Cost Test: Measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected are less than the total costs incurred by the utility. The RIM test indicates the direction and magnitude of the expected change in customer bills or rate levels.

Total Resource Cost (TRC) Test: Measures the net costs of a demand side management program as a resource option based on the total costs of the program, including both the participant and utility costs.

British thermal unit (Btu): The amount of heat needed to raise one pound of water at maximum density one degree Fahrenheit. Btu is used to describe the power of heating and cooling systems, such as furnaces, stoves, barbecue grills, and air conditioners. Air conditioners for household use typically produce between 5,000 and 15,000 Btu. 1 watt is approximately 3.41 Btu/h.

Coincidence Factor: The ratio, expressed as a numerical value or as a percentage, of the simultaneous maximum demand of a group of electrical appliances or consumers within a specified period to the sum of their individual maximum demands within the same period.

Cost-effectiveness: A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the lowest cost alternative for the achievement of a given target.

Demand Side Management (DSM): Programs designed to provide incentives to end-use customers or curtailment service providers to enhance the ability and opportunity for reduction of load during peak hours.

Energy Efficiency Ratio (EER): average efficiency of the equipment under peak conditions. A measure of the relative efficiency of a heating or cooling appliance, such as an air conditioner, that is equal to the unit's output in Btu's per hour divided by its consumption of energy, measured in watts.

Equivalent Full Load Hours (EFLH): The number of hours a system operates at full load during one year for cooling or heating purposes. Expressed as total annual energy use divided by total peak load.

Evaluation Measurement and Verification (EM&V): A set of analyses used to assess energy efficiency programs in terms of energy and demand savings and cost-effectiveness. There are several approaches to EM&V, some of which have been codified as best practices (see IPMVP). Most energy efficiency programs are subject to some type of EM&V.

GRIDSSMART® Programs: An AEP energy efficiency initiative that includes over 100 energy efficiency programs across the AEP service territory. The programs feature smart grid technologies such as smart meters, voltage optimization equipment and smart appliances that can reduce energy use.

Gross Energy Savings: Energy and demand savings seen by the participant at the meter. These are the appropriate program impacts to calculate bill reductions for the Participant Test.

Heating Season Performance Factor (HSPF): measure of seasonal average efficiency of equipment in heating mode.

Impact Evaluation: A method of evaluation that assesses any changes, intended or unintended that are directly attributable to an energy efficiency program.

International Performance Measurement and Verification Protocols (IPMVP): Provides an overview of current best practice techniques available for verifying results of energy efficiency, water efficiency, and renewable energy projects in commercial and industrial facilities. It may also be used by facility operators to assess and improve facility performance. Energy conservation measures covered in the protocols include fuel saving measures, water efficiency measures, load shifting and energy reductions through installation or retrofit of equipment, and/or modification of operating procedures.

Kilowatt (kW): A unit of power that describes the rate at which energy is generated or used. It quantifies the electric power required by an appliance or device such as a light bulb.

Kilowatt Hour (kWh): A unit of energy that describes how much electricity is consumed over a period of time. For example, if you turn on a 100 watt light bulb all day for 24 hours the light bulb consumed 2.4 kWh of electricity.

Net Energy Savings: The energy and demand savings attributable to the program, adjusted for free riders and spillover.

Net-to-Gross (NTG) Ratio: The ratio of net energy savings to gross energy savings indicates the overall effectiveness of an energy efficiency program. As the NTG ratio approaches one, the magnitude of the program impact increases.

Free Riders: Customers who participate in energy efficiency programs who would have engaged in the efficient behavior in the absence of the program. As a result, the presence of free riders tends to overestimate the energy savings of the program.

Spillover: Customers who engage in energy efficient behavior, but do not participate in the program, due to some influence of the program.

Process Evaluation: A method of evaluation that uses empirical data to assess the delivery of energy efficiency programs, verify goals and determine whether the program is implemented as designed.

Program Logic Model: Graphic representation of an energy efficiency program and its processes. Logic models shows the causal relationships or linkages among the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders critical to a program's performance.

Seasonal Energy Efficiency Ratio (SEER): average efficiency of the equipment during a typical cooling-season at the location of the measure. Ratio of the cooling output (Btu) divided by the power consumption (total electric energy input in watt-hours) during the same period. The higher the SEER, the more efficient the unit.

Executive Summary

Applied Energy Group, Inc ("AEG") was retained by Kentucky Power Company ("KPCO" or "Kentucky Power") to conduct a process, market and impact evaluation of its Small Commercial Heat Pump/Air Conditioner Incentive Program. The program offers financial incentives to small commercial customers (less than 100 kW) for upgrading to a new qualifying central air conditioner or heat pump system, up to a 5 ton unit. The system must meet the Consortium for Energy Efficiency ("CEE") guidelines and be installed by a participating KPCO HVAC dealer.

AEG designed the process and market evaluation to examine program processes and customer responses to the program. The evaluation identifies methods for gathering data and measuring program results and makes recommendations for program improvements. To arrive at the final recommendations, AEG performed the following tasks:

- Reviewed program materials, data and tracking methods.
- Updated program logic model and assessed program flow.
- Conducted interviews with KPCO staff.
- Conducted surveys and site visits with participating customers.
- Conducted surveys of participating HVAC dealers.

AEG designed the impact evaluation to assess the gross and net demand savings, gross and net energy savings, and the cost-effectiveness of installed measures. The evaluation verifies gross and net savings and measures installation. To verify program impacts, AEG performed the following tasks:

- Calculated the gross energy (kWh) and peak (kW) impacts by project using engineering calculations.
- Performed cost-effectiveness analysis using a benefit-cost analysis model.
- Conducted site inspections of a sample of installed projects.

Summary of Key Findings

The Small Commercial Heat Pump/Air Conditioner Program is designed to encourage the purchase of energy efficiency central air conditioners and heat pumps identified by the U.S Department of Energy, the U.S. Environmental Protection Agency and/or the Consortium for Energy Efficiency as being influential in energy efficiency. The program helps lower customer electric bills and allows KPCO to utilize its existing generating capacity more efficiently, thereby deferring or delaying the need for new generation.

Program Performance Indicators

In 2011, Kentucky Power rebated 24 small commercial central air conditioners and heat pumps through the Small Commercial Heat Pump/Air Conditioner Incentive Program at a much higher cost per unit than originally budgeted (\$980 versus \$575). The higher cost per participant may be attributed to the high fixed costs associated with promotional and evaluation activities that were independent of program participation.

Eighty-eight (88) percent of the systems installed were heat pumps and 13 percent were central air conditioners. The program was approved in August 2010, two months later than anticipated in the Kentucky PSC filing, and implemented in September. The first rebate was issued in April 2011. KPCO reached 53 percent of the revised 40 heat pump participant goal and 12 percent of the revised 25 air conditioner participant goal.

Table ES1 2011 Program Participation, Actual and Goals

	Actual	Original Goal	Revised Goal
Heat Pump	21	20	40
Central Air Conditioner	3	100	25
Total	24	120	65

In 2010 and 2011, 23 out of 101 participating HVAC dealers participated in the HVAC Diagnostic and Tune-Up Program or Small Commercial Heat Pump/Air Conditioner Incentive Program. One dealer performed 54 percent of the small commercial heat pump/air conditioner installations. The HVAC dealers surveyed noted that the KPCO dealer incentives and being listed on the KPCO website as a participating dealer were significant motivators for participation.

Program Tracking

Kentucky Power's program tracking system is comprised of three databases. The program log tracks all rebate application data, including customer information, dealer name and HVAC system data. The CEE guidelines provide minimum energy efficiency standards for commercial HVAC equipment. The minimum energy efficiency standards may apply to SEER and/or EER, depending upon the needs of the energy efficiency program.

Of the 21 heat pump systems rebated by Kentucky Power, 17 met the CEE Tier 1 SEER/EER and HSPF guidelines. Two (2) systems did not meet the guidelines and 2 had inadequate system efficiency information. Of the 3 central air conditioner systems rebated by Kentucky Power, 1 met the CEE Tier 1 SEER/EER guidelines. One (1) did not meet the guidelines and 1 had inadequate system efficiency information.

Program Awareness and Marketing Strategies

The marketing strategy for the program included a combination of Kentucky Power program staff and participating HVAC dealers. KPCO staff promoted the programs directly to HVAC dealers through fact sheets, calls and meeting-in person to discuss the program. In turn, the participating dealers were expected to promote the program to eligible customers. Additional marketing activities included direct mail, fact sheets, bill inserts, newspaper advertisements and community events.

According to survey respondents, customers most often learned of the program from the heating and cooling contractor (54%) followed closely by a Kentucky Power employee (46%). Ninety-two (92) percent of participating customers surveyed noted that information from the contractor was a crucial factor in their decision to purchase and install efficient HVAC equipment. Participating customers and HVAC dealers surveyed noted that the program would benefit from increased publicity and advertising.

Best Practices

Kentucky Power's program design and processes are consistent with industry standards that are considered best practice for similar programs. Given the nascent stage of Kentucky Power's program it is commendable that the program has received the level of support from the contractor community and satisfaction recognition from participating customers. The majority (approximately 72%) of energy efficiency programs targeted at commercial customers provide customer incentives for unitary HVAC equipment.¹

The challenges posed by lack of information are ubiquitous in energy efficiency programs. Investment in education and outreach boost awareness of the benefits of energy efficiency. Successful marketing strategies can increase program participation. Actively engaging key stakeholders, such as HVAC contractors or home/business owners, is crucial to the success of any energy efficiency program. Typically, programs will feature periodical stakeholder advisory meetings or other formal outreach that encourages participation and provides valuable feedback throughout the program.

Many energy efficiency programs suffer from lack of staff resources. Additional staff personnel may be necessary to ensure that program goals are met and that the program delivers the intended results. The increased program costs of additional staff are often recouped by improved performance.

Verify Program Impacts

The net-to-gross ratio is estimated at 78 percent, with 27 percent free ridership and 5 percent spillover. Program cost-effectiveness was greatly affected by low participation rates and program administration, marketing and evaluation costs that remained constant independent of program participation. If administrative expenses stay consistent, the cost-effective break-even point is 30 heat pump participants and 15 air conditioner participants. Heat pumps have shown to be more cost-effective than central air conditioners. If participation goals are achieved, especially for heat pumps, the program will be cost-effective and have a positive impact on the Kentucky Power service territory.

Table ES2 Energy Savings, 2011

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Program Total	78%	1.774	8.708	24,634	0.73

Installations of both heat pumps and air conditioners were inspected with building types including medical offices, retail showrooms, churches, and hotels. The sites inspected provided a representative sample of all program projects. Proper installation verification was confirmed at all locations.

Recommendations

AEG has several recommendations on how to improve the program. These include:

¹ Consortium for Energy Efficiency (2012). State of the Efficiency Program Industry: Budgets, Expenditures and Impacts 2011.

Hire Implementation Contractor

AEG recommends that Kentucky Power hire an implementation contractor to implement Kentucky Power's residential and small commercial HVAC programs, including, but not limited to, the Small Commercial Heat Pump/Air Conditioner Incentive Program, the Residential and Small Commercial HVAC Diagnostic and Tune-Up Program, the Residential High Efficiency Heat Pump Program, Mobile Home High Efficiency Heat Pump, and Mobile Home New Construction.

Kentucky Power has a small staff to run and oversee Kentucky Power's numerous energy efficiency programs. Some of the KPCO programs have implementation contractors that perform the day-to-day operations of the programs, but the residential and small commercial HVAC programs are run completely by KPCO staff. Therefore, KPCO staff is responsible for marketing and promotional activities, including visiting participating and potential HVAC dealers across the KPCO territory, processing rebate applications, tracking rebate applications and performing QA/QC inspections. Due to the limited resources, Kentucky Power has not yet conducted an inspection to ensure services are being performed properly.

The residential and small commercial HVAC programs share many similar components, including marketing and promotional activities and data tracking systems as well as the same participating HVAC dealers. Utilizing one implementation contractor to implement the HVAC programs will allow the programs to continue capitalizing on their similarities and increase the efficiency of program processes.

The implementation contractor will have, at a minimum, the following responsibilities:

- Develop program goals and budget.
- Develop marketing and promotional activities.
- Design and maintain a data tracking system.
- Process customer and contractor rebate applications.
- Engage and monitor participating HVAC dealers.
- Develop QA/QC procedures and conduct random inspections of completed work.

Kentucky Power program staff and the implementation contractor should work with the Commercial Incentive Program implementation contractor to ensure that the Small Commercial Heat Pump/Air Conditioner Incentive Program does not compete with the Commercial Incentive Express Program. If it is determined that competition exists, the programs should be examined to determine if the Small Commercial HP/AC Incentive Program should be absorbed into the Commercial Incentive Express Program.

Program Modifications

AEG recommends that Kentucky Power clarify the program requirements. To receive a rebate, the HVAC systems must meet the CEE guidelines, which provide minimum energy efficiency standards for commercial HVAC equipment. The minimum energy efficiency standards may apply to SEER and/or EER, depending upon the needs of the energy efficiency program. Kentucky Power does not specify whether HVAC systems must meet both the SEER and EER requirements. AEG recommends that

Kentucky Power and the implementation contractor consider modifying the program requirement, such that HVAC systems must meet the CEE Tier 1 SEER and HSPF guidelines. The Kentucky Power program website should be updated to reflect any program requirement modifications.

AEG recommends increasing rebate processing oversight conducted by Kentucky Power and the implementation contractor to ensure compliance with program requirements. In particular, oversight activities should ensure that HVAC equipment qualifies for a rebate and equipment efficiency data is correctly recorded and tracked. Of the 24 systems rebated, 3 did not meet the CEE Tier 1 guidelines and 3 had inadequate system efficiency information.

Engage Participating HVAC Dealers

AEG recommends that Kentucky Power and the implementation contractor actively engage participating HVAC dealers and remove non-participating HVAC dealers from the participating HVAC dealer list if they have not actively participated in a KPCO HVAC program within the most recent 12 months.

HVAC dealer participation is crucial to the program; 92 percent of survey respondents noted that information from the contractor was a crucial factor in their decision to purchase and install efficient HVAC equipment. There are currently 101 HVAC dealers participating in the HVAC programs. In 2010 and 2011, only 23 dealers participated in the HVAC Diagnostic and Tune-Up Program or the Small Commercial Heat Pump/Air Conditioner Incentive Program.

AEG recommends collaboration between Kentucky Power and the implementation contractor to engage contractors and explore modifying the marketing and promotional activities. Kentucky Power and the implementation contractor should explore cooperative marketing with the participating contractors to potentially leverage contractor's marketing experience. Cooperative marketing would be offered on a temporary basis and the impact on participation reviewed before permanent changes were made to the program.

1. Introduction

Applied Energy Group, Inc. ("AEG") was retained by Kentucky Power Company ("Kentucky Power" or "KPCO") to conduct a comprehensive evaluation of its 2010-2012 Demand Side Management ("DSM") Program Portfolio.² The 2010-2012 DSM Program Portfolio includes the Residential Efficient Products Program, Residential and Small Commercial HVAC Diagnostic and Tune-up Program, Commercial Incentive Program, Small Commercial High Efficiency Heat Pump and Air Conditioner Program, and the Residential and Small Commercial Load Management Pilot Program. The DSM programs will be evaluated concurrently and individual program Evaluation, Measurement and Verification ("EM&V") reports will be filed with the Kentucky Public Service Commission ("PSC") by the August 15, 2012 regulatory filing deadline.

Kentucky Power is an electric utility that serves approximately 175,000 customers in all or part of 20 eastern Kentucky counties.³ The utility is part of the American Electric Power ("AEP") system, which is one of the largest electric utilities in the United States.⁴ The 2010-2012 DSM Program Portfolio was implemented to help Kentucky Power and AEP reduce electricity use and peak demand, help customers lower their electricity bills, and encourage long-term change in the market through the adoption of energy efficiency technologies and services.

The Small Commercial Heat Pump/Air Conditioner Incentive Program offers small commercial (less than 100 kW) financial incentives for upgrading to a new qualifying central air conditioner or heat pump system, up to a 5 ton unit. The systems, which must meet the Consortium for Energy Efficiency ("CEE") guidelines, must be installed by a participating KPCO HVAC dealer. The program is designed to encourage the purchase of energy efficiency central air conditioners and heat pumps.

This report describes the key findings from the process, market and impact evaluation and provides recommendations for improving program performance and operations. Section 2 provides a program description and Section 3 described the process, market and impact evaluation methodology. Sections 4 and 5 present the process, market and impact evaluation findings. Key findings and recommendations are described in Section 6.

2. Program Description

The Small Commercial Heat Pump/Air Conditioner Incentive Program offers small commercial customers (less than 100 kW) financial incentives for upgrading to a new qualifying central air conditioner or heat pump system, up to a 5 ton unit. The system must be installed by a participating KPCO HVAC dealer and meet the current Consortium for Energy Efficiency guidelines for energy efficiency.

² Kentucky Power's 2010-2012 DSM programs were approved in Case No. 2010-00095 and Case No. 2010-00198.

³ Kentucky Power. Facts, Figures & Bios. Accessed at www.kentuckypower.com/info/facts/

⁴ American Electric Power delivers electricity to more than 5 million customers in 11 states and ranks among the nation's largest generators of electricity, with almost 38,000 megawatts of generating capacity in the U.S.

Customer incentives are presented in Table 1. KPSC participating HVAC dealers are eligible for a \$50 rebate for each system installed (dealer will only receive incentive if customer rebate application is approved). The dealer must be a state-licensed contractor. Heat pump incentives are limited to customers whose primary heating source is electricity. Customers are limited to one rebate per eligible unit every three years.

Table 1 HVAC System Incentive Levels

Equipment Type	Incentive
Central Air Conditioner	
≤36,000 Btu/h	\$250
36,000 ≤ 65,000 Btu/h	\$400
Heat Pump	
≤36,000 Btu/h	\$300
36,000 ≤ 65,000 Btu/h	\$450

The program is designed to encourage the purchase of energy efficiency central air conditioners and heat pumps identified by the U.S Department of Energy, the U.S. Environmental Protection Agency and/or the Consortium for Energy Efficiency as being influential in energy efficiency. The program helps lower customer electric bills and allows KPSC to utilize its existing generating capacity more efficiently, thereby deferring or delaying the need for new generation.

The Kentucky Public Service Commission ("PSC") approved a three-year budget and participation goals for the Small Commercial Heat Pump/Air Conditioner Incentive Program. Tables 2 and 3 present the program budgets and participations goals for 2010 through 2012 by system type. The program budgets were revised from the original filing to \$47,100 in 2011 and \$50,470 in 2012. The participation goals were revised from the original filing to 65 in 2011, 25 central air conditioners and 40 heat pumps, and 60 in 2012, 20 central air conditioners and 40 heat pumps. Table 4 shows the anticipated energy and demand savings per participant by system type as originally filed.⁵

Table 2 Detailed Program Budget, 2010-2012

	2010	2011	2012
Equipment/Vendor	\$3,000	\$6,000	\$6,000
Customer Incentive	\$24,500	\$49,000	\$49,000
Promotion	\$5,700	\$12,000	\$12,000
Evaluation	\$2,000	\$2,000	\$6,000
Total	\$35,200	\$69,000	\$73,000

Table 3 Program Participation Goals, 2010-2012

	2010	2011	2012
Central Air Conditioner	50	100	100
Heat Pump	10	20	20

⁵ See Case No. 2010-00095, Case No. 2011-00300 and Case No. 2012-00051.

Table 4 Anticipated Energy and Demand Savings per Participant

	Summer kW	Winter kW	kWh
Central Air Conditioner	0.164	-	313
Heat Pump	0.164	0.350	1,240

3. Evaluation Methodology

AEG designed the process, market and impact evaluation to determine the efficacy of program procedures and systems, evaluate the achievement of program objectives, provide insight into and recommendations for program improvement and verify the direct impacts of program activities.

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and quality assurance/quality control ("QA/QC") procedures are performing as designed and identifies issues or opportunities to improve these key elements. The goals of the process and market evaluation are to:

- Examine key performance indicators to identify participation or program issues;
- Conduct a comprehensive review of program tracking or monitoring systems to review the accuracy of and trends in data;
- Determine awareness levels as a way to refine marketing strategies and reduce barriers to program participation;
- Assist program implementers and managers to structure programs and achieve cost-effective savings while maintaining high levels of customer satisfaction;
- Provide recommendations for changing the program's structure, management, administration, design, delivery, operations or goals; and

Impact evaluations verify the energy and demand savings directly associated with a program and assess the cost-effectiveness of the DSM program. The goals of the impact evaluation are to:

- Verify the annual energy and coincident peak capacity savings and total resource benefit claims made by Kentucky Power; and
- Provide verification and documentation of DSM program impacts.

To arrive at the final recommendations, AEG carried out the following research activities.

Review Program Materials

AEG reviewed current program materials, documents and processes, including the rebate applications and marketing and outreach materials. The review served as the basis for understanding whether the program has been implemented as planned. The review was particularly important for preparing the interview guides and survey instruments for other process evaluation tasks.

Program Logic Model

AEG developed a program logic model based on a review of program materials and discussions with Kentucky Power program staff. The model shows the linkages between the program components,

including activities, outputs, outcomes and key stakeholders. The model also highlights potential external influences and program inputs.

Program Tracking and Database Review

AEG reviewed current Kentucky Power rebate application review and processing, program tracking and reporting, and tracking databases.

Kentucky Power Staff Interview

AEG conducted a comprehensive, group interview with Kentucky Power program staff in November 2011. The purpose of this interview was to get staff impressions of program implementation activities, program performance, marketing and customer awareness of the program, program data and tracking mechanisms, and opportunities for improving the program. Individual interviews with program staff, as well as informal discussions regarding program performance, were also conducted between December 2011 and March 2012. Individual interviews focused on program design and delivery issues, program performance, potential areas of improvements, and overall program effectiveness.

Participating Dealer Interview

AEG administered a 10 to 12 minute telephone survey to a sample of participating HVAC dealers. The survey provided an assessment of customer satisfaction, identified potential areas for improvement and provided insight about customer attitudes toward energy efficiency and conservation issues. The survey also provided insight on marketing and coordination efforts, application processes, and the usefulness of support materials from Kentucky Power. The participating HVAC dealer survey guides can be found in Appendices A and B.

Currently, 101 HVAC dealers are participating in the HVAC Diagnostic and Tune-Up Program and Small Commercial Heat Pump/Air Conditioner Incentive Program. Twenty-one (21) HVAC dealers submitted a rebate for one or both of the programs. AEG conducted 17 surveys of participating HVAC dealers, 9 with dealers that submitted a rebate in 2011 and 8 with dealers that did not submit a rebate in 2011.

Participating Customer Surveys

AEG administered a 10 to 12 minute telephone survey to a sample of program participants to assess program experience and awareness, customer satisfaction, barriers to participation, free ridership and areas for potential program improvement. The participating customer survey guide can be found in Appendix C.

Kentucky Power provided data for 24 program participants that received a rebate in 2011. The sample included 21 unique electric accounts, which were identified by the participant's account number and address. AEG calculated the sample size at a 90 percent confidence interval with an error margin of +/- 10 percent. Participants were then randomly selected based on unique identifiers determined by Microsoft Excel's random number generator. Thirteen (13) surveys were completed. AEG conducted site visits and inspections of seven participants (which includes eight installations) to assess services rendered and verify installation.

Review Engineering or Deemed Savings Assumptions

AEG reviewed the engineering and/or deemed savings assumptions utilized by AEP to calculate program energy and demand impacts. Kentucky Power's initial program filing deemed savings assumptions were reviewed to ensure consistence with the impact evaluation results.

Gross Energy and Demand Impacts

AEG determined the gross energy and demand savings of a representative sample based on Option A of the International Performance Measurement and Verification Protocols ("IPMVP")⁶ outlined in Table 5.

Table 5 Overview of IPMVP Options

IPMVP M&V Option	Measure Performance Characteristics	Data Requirements
Option A: Engineering calculations using spot or short-term measurements, and/or historical data	Constant performance	<ul style="list-style-type: none"> • Verified Installation • Nameplate or stipulated performance parameters • Spot measurements • Run-time hour measurements
Option B: Engineering calculations using metered data.	Constant or variable performance	<ul style="list-style-type: none"> • Verified Installation • Nameplate or stipulated performance parameters • End-use metered data
Option C: Analysis of utility meter (or sub-meter) data using techniques from simple comparison to multivariate regression analysis.	Variable performance	<ul style="list-style-type: none"> • Verified installation • Utility metered or end-use metered data • Engineering estimate of savings input to SAE model
Option D: Calibrated energy simulation/modelling; calibrated with hourly or monthly utility billing data and/or end-use metering	Variable performance	<ul style="list-style-type: none"> • Verified installation • Spot measurements, run-time hour monitoring, and/or end-use metering to prepare inputs to models • Utility billing records, end-use metering, or other indices to calibrate models

Engineering calculations referenced from the *State of Illinois Technical Reference Manual*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts for central air conditioners and heat pumps.

Net Energy and Demand Impacts

AEG adjusted the gross energy and demand savings to reflect estimates of free ridership and spillover. Free ridership and spillover were determined from the participating customer interviews; see Section 5 for a detailed explanation.

Cost-Effectiveness Analysis

AEG analyzed the cost-effectiveness of the Small Commercial Heat Pump/Air Conditioner Incentive Program utilizing Bencost, an updated version of a public domain model that AEG customized for Kentucky Power. Bencost is an input-output model that calculates four standard California cost-effectiveness tests, the Total Resource Cost, Participant Test, Utility Test and Rate Impact Measure Test.

⁶ IPMVP provides best practice techniques for verifying results of energy efficiency projects, i.e. verifying savings attributed to energy efficiency projects.

The analysis was conducted using Kentucky Power specific inputs, including avoided costs, discount rates, participation and incentives. Cost-effectiveness inputs and outputs are detailed in Appendix D.

4. Process and Market Evaluation Findings

The process and market evaluation identifies whether key elements, such as incentive levels, program delivery, program tracking mechanisms and QA/QC procedures are performing as designed. When potential deficiencies in these areas arise, the process and market evaluation identifies opportunities for improving these key elements.

4.1 Program Logic Model

Program logic models are graphic representations of an energy efficiency program and its processes. Logic models show the causal relationships or linkages between the problem or situation the program is designed to address, the intervention (inputs and outputs) and the program's impacts (short, intermediate and long-term outcomes). A logic model helps identify partnerships and stakeholders that are critical to a program's performance.⁷

Key elements of a program logic model include:

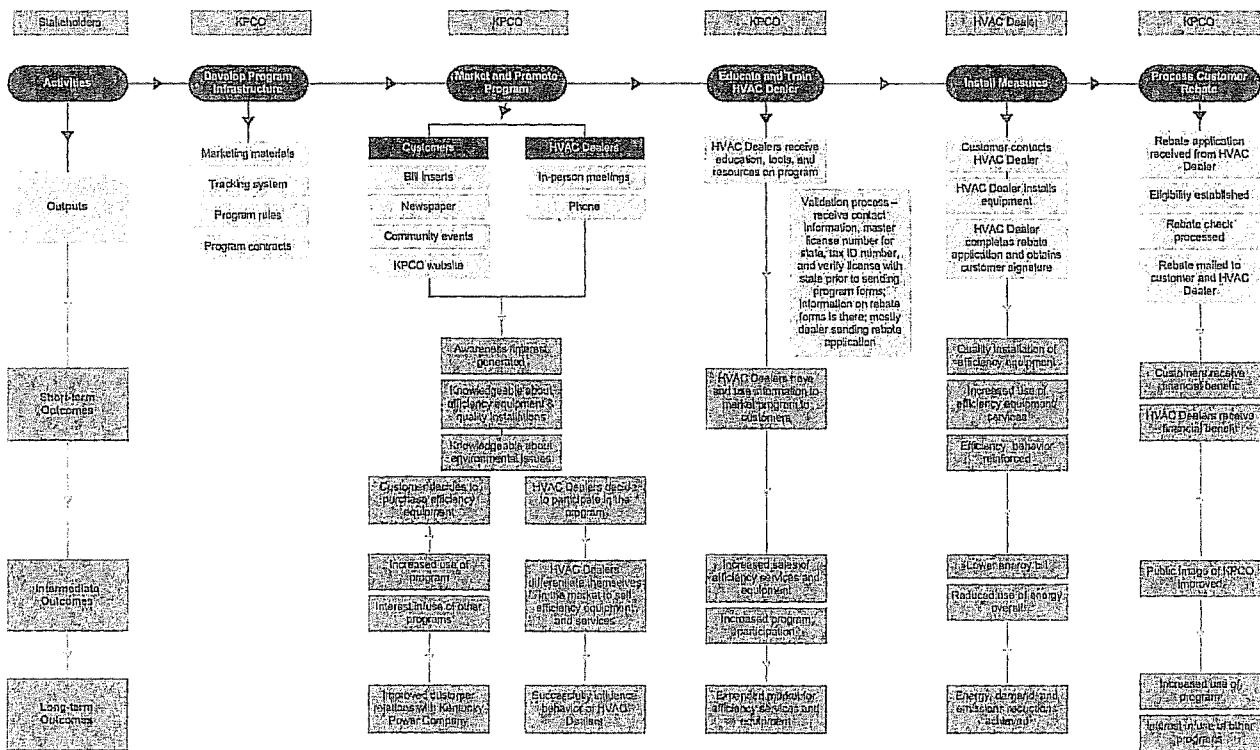
- **Inputs.** Resources that program stakeholders contribute to a program, such as knowledge, skills, expertise, finances or equipment.
- **Outputs.** Program activities and number of people reached, based on program goals.
- **Outcomes.** Short-term, intermediate or long-term results of the program outputs. Assists evaluators and program administrators in establishing program results.
- **External Influences.** Factors outside the utility's control that may influence the program outcomes. They help to identify important program partnerships as well as the issue(s) the program can realistically influence. The factors help determine which evaluation measures will accurately reflect project outcomes or any other goals that must be met to address the problem or situation.

In the logic model presented in Figure 1, program activities are oriented sequentially across the top of the page from the left to the right. The sequence of program activities is important. For example, the program's infrastructure, including its advertising materials, tracking systems, program rules, and contracts must be developed before the program can be marketed and customers recruited. The performance outputs and outcomes are oriented vertically from top to bottom. The box on the bottom right contains the external factors outside the utility's control that may affect program performance.

⁷ McCawley, P. (2001). *The Logic Model for Program Planning and Evaluation*. Moscow: University of Idaho Extension.

Figure 1 Program Logic Model

Inputs: program funding, PSG goals and reporting requirements, Kentucky Power program staff, implementation contractor resources and expertise, evaluation contractor resources and expertise, existing awareness of Kentucky Power



External Influences: Changes in political priorities (e.g. codes and standards, state and local regulations, federal policies); weather and associated impacts on energy bills; energy prices and regulation; changes in utility rate structures; perceptions in the value of energy efficiency; compelling interests among demand side customers; competition among targeted trade allies; cost, performance and availability of efficiency technologies and services

4.1.1 Activities and Outputs

There are five main activities in the Small Commercial Heat Pump/Air Conditioner Incentive Program. The program activities and their corresponding outputs help to establish linkages between the situation that the program is designed to address and the program's intended outcomes. Therefore, activities and outputs are discussed together.

Develop Program Infrastructure

Activities include gathering market knowledge, setting program goals, designing the program, establishing program rules, developing marketing approaches and content, and establishing institutional and operating structures. Kentucky Power staff, with input from AEP, designed the program, including rebate applications, data tracking system and marketing materials.

Market and Promote Program

The marketing strategy for the program included a combination of Kentucky Power program staff and participating HVAC dealers. Kentucky Power staff promoted the programs directly to HVAC dealers, mailing program fact sheets as well as calling and meeting in-person with dealers to discuss the programs. Additional marketing activities included direct mail, fact sheets, bill inserts, newspaper advertisements and community events. Participating HVAC dealers were encouraged, and expected, to promote the program to eligible customers

Educate and Train Contractors

Kentucky Power program staff developed relationships and maintained direct contact with participating HVAC dealers. Kentucky Power program staff educated dealers on the Small Commercial Heat Pump/Air Conditioner Incentive Program, including the eligible customers, qualifying equipment, rebate forms and rebate processing. Program staff also provided guidance on KCPO tools and resources, such as program paperwork, KCPO website, as well as how to use energy efficiency as a sales tool. Kentucky Power maintains a list of participating dealers on the DSM Program website.

Install Measures

The customer learned of the program directly from the participating dealer or some other source, such as KPCO marketing or word of mouth. The customer purchased an eligible heat pump and/or air conditioner system from a participating HVAC dealer and the dealer installed the equipment. After the system was installed, the customer received the rebate application from the HVAC dealer. The dealer was responsible for completing and faxing the paperwork to KPCO program staff.

Eight out of nine participating HVAC dealers surveyed completed and submitted the rebate application for the customer. One HVAC dealer had the customer submit the rebate application.

Process Customer Rebate

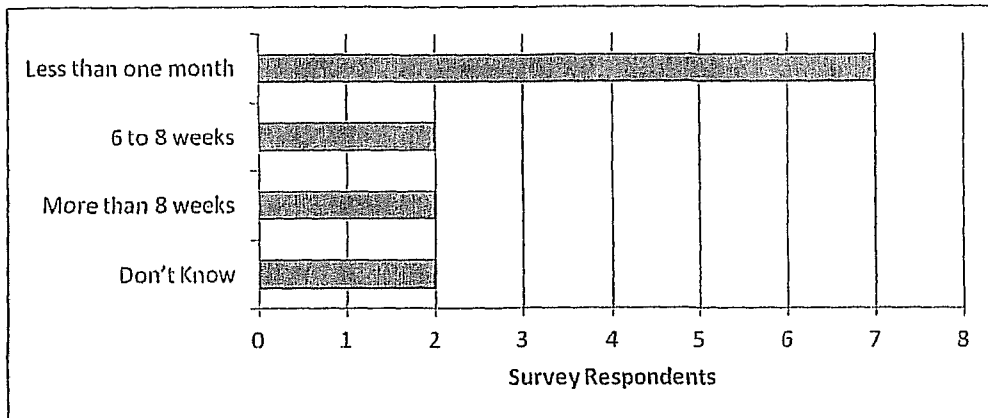
Customer rebates were processed by the Kentucky Power program staff. Staff reviewed the rebate applications to ensure the application was complete and the customer/dealer was eligible for an incentive. The application data was entered into the program tracking system and a payment request submitted to KPCO program staff for review. Once approved, the customer/dealer data was submitted

to AEP's Accounting Group and a rebate check issued and mailed. According to Kentucky Power program staff,

It generally took one to two weeks for the customer to receive the rebate check, once the application was received by Kentucky Power.

According to participating customers, it often took less than one month to receive the rebate check from the time the application was submitted.

Figure 2 Length of Time between Submitting Application and Receiving Rebate Check, n=13



Kentucky Power maintained the right to conduct inspections on a sample of equipment that received diagnostic and tune-up services to ensure services are being performed properly and therefore the energy savings are being achieved. To-date no inspections have been conducted.

4.1.2 Outcomes

Outcomes are the result of program partners and target audiences responding to the program outputs.

Short-term Outcomes

When the program is marketed and promoted, awareness and interest in efficient HVAC equipment may increase among customers and HVAC dealers. Customers may become more knowledgeable about energy efficient equipment and quality installation. Other short-term outcomes include the HVAC dealers having information to market the program to customers, increased use of energy efficient equipment and services, and the financial benefit the customer and HVAC dealer receives by participating in the program. The program may lead to an increased commitment to energy efficiency.

Intermediate Outcomes

Intermediate outcomes may include increased use of the program, interest in, and use of, other KPSC efficiency programs, increased sales of energy efficient HVAC equipment and reduced household energy consumption.

Long-term Outcomes

The long-term outcomes may include energy and demand savings, influence behavior of HVAC dealers, and an expanded market for energy efficient HVAC equipment. Additional outcomes include reduced utility emissions, fewer greenhouse gases emitted. Kentucky Power may enhance its public image as a utility that responds to customer needs without sacrificing consideration of environmental issues.

4.1.3 External Factors

Documenting external factors outside the control of Kentucky Power and its stakeholders improves program planning and evaluation by identifying important program partners, the activities the program can realistically influence, which evaluation measures will accurately reflect project outcomes, and other needs that must be met.

- Changes in political priorities (e.g. codes and standards, state and local regulations, federal policies, perceptions of energy and climate change);
- Weather and associated impacts on customer actions and energy bills;
- Energy prices and regulation;
- Changes in utility rate structures;
- Perceptions in the value of energy efficiency;
- Competition among targeted HVAC dealers;
- HVAC dealer business practices and interest in energy efficient technology; and
- Cost, performance and availability of efficient technologies and services.

4.1.4 Best Practices

Program administrators encounter common challenges that hinder energy efficiency programs from achieving maximum benefits, including, but not limited to:

- Lack of information and awareness of energy efficiency benefits.
- Limited resources / High initial costs energy efficient technologies.
- Competing priorities among customers and program administrators.
- Lack of clear, well-communicated program goals that correspond to overall organizational goals.

Best practices can provide ideas and/or tools to overcome these and other program barriers. Some key best practices include, but are not limited to, the following:

- Coordinate with other energy efficiency program administrators to overcome market barriers.
- Increase awareness by investing in education, outreach and marketing activities.
- Solicit stakeholder input and feedback to optimize program design and delivery.
- Develop reliable program tracking systems to support evaluation and implementation.

4.2 Program Performance

In 2011, 24 customer HVAC systems were rebated under the Small Commercial Heat Pump/Air Conditioner Incentive Program. Heat pumps accounted for 87.5 percent of systems installed and central air conditioners accounted for 12.5 percent (see Figure 3). Kentucky Power rebated 21 heat pumps in

2011, achieving 53 percent of the revised 40 participant goal, and 3 central air conditioners, achieving 12 percent of the revised 25 participant goal.

The program was expected to be approved by the Kentucky PSC in June 2010.⁸ However, the program was approved in August 2010 and implemented by Kentucky Power program staff in September. In September and October 2010, Kentucky Power issued introduction letters and incentive forms to participating HVAC dealers and conducted follow-up phone calls. The first rebates were issued in April 2011.

Table 6 Program Participation, 2011

	Actual	Original Goal	Revised Goal
Heat Pump	21	20	40
Central Air Conditioner	3	100	25
Total	24	120	65

Figure 3 HVAC Installations by System Type, 2011

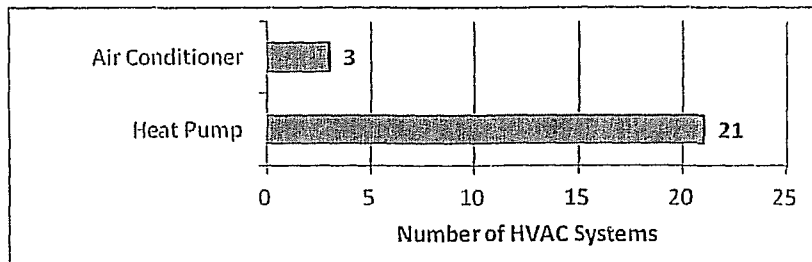


Table 7 presents the HVAC installations by system type and size. Sixty-two (62) percent of heat pumps were sized less than 36,000 Btu/h.

Table 7 HVAC Installations by System Type and Size, 2011

	Heat Pump	Central Air Conditioner
Less than 36,000 Btu/h	13	1
36,000 to 65,000 Btu/h	8	2

Energy efficiency programs that offer services for cooling measures typically experience increased participation during the summer months, when the outside temperature is hottest and cooling equipment is used on a consistent basis. During the summer, customers that use space cooling equipment may find the program essential. Therefore, a customer is more likely to purchase and install a central air conditioner during the spring and summer months. While only three central air conditioners were rebated in 2011, they were purchased and installed in the warmer months.

Heat pumps provide cooling and heating to customers. Therefore, customers will purchase and install heat pumps year round, but primarily during the spring and fall seasons in preparation for the summer and winter seasons. Heat pumps rebates spiked in the spring and again in the fall.

⁸ See Case No. 2010-00095.

Figure 4 presents the number of systems rebated by system type and sector. If the summer or winter months are mild, as compared to the historic temperature, customers will not be as likely to utilize their cooling and heating equipment. Therefore, customer participation in the Small Commercial Heat Pump/Air Conditioner Incentive Program would decrease.

Figure 4 HVAC Systems Rebated Monthly by System Type, 2011

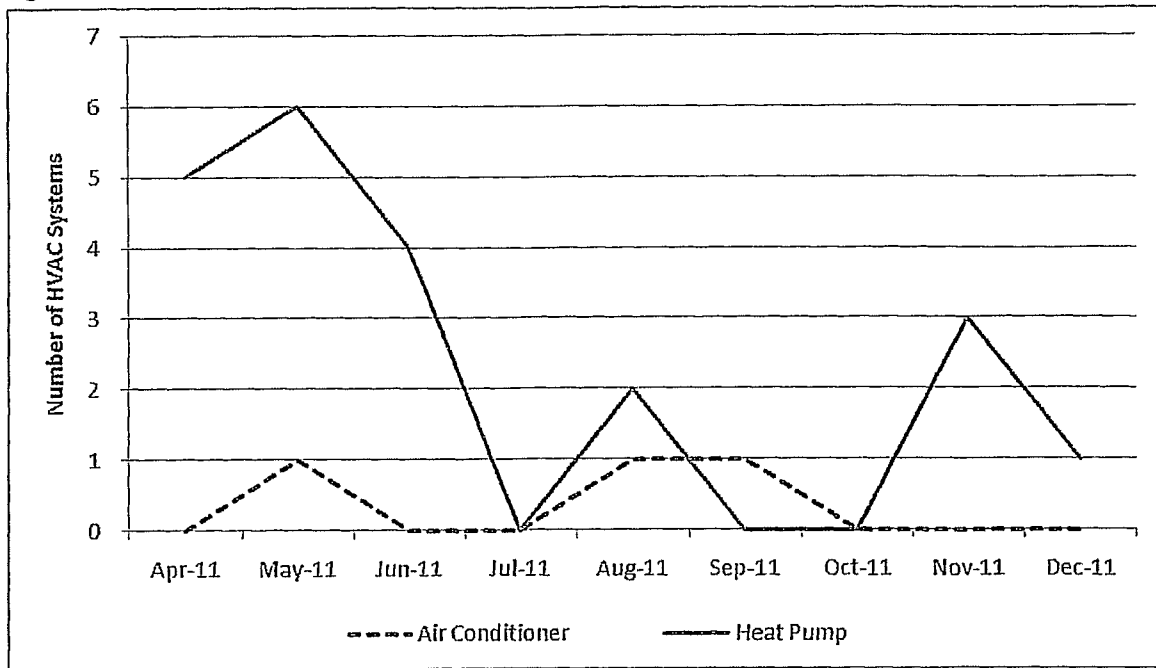


Table 8 presents the budget and budgeted cost per participant as compared to the actual expenditures and actual cost per participant. The actual 2011 expenditures were \$23,516 compared to the original approved budget of \$69,000.⁹ However, the actual cost per participant was significantly higher than budgeted. The higher cost per participant may be attributed to the high fixed costs associated with promotional and evaluation activities, that were independent of program participation.

Table 8 2011 Cost per Participant, Budgeted and Actual

	Budgeted	Actual
Equipment/Vendor	\$6,000	\$1,150
Customer Incentive	\$49,000	\$7,950
Promotion	\$12,000	\$9,636
Evaluation	\$2,000	\$4,780
Total Cost (\$)	\$69,000	\$23,516
Participation	120	24
Cost (\$) per Participant	\$575	\$980

⁹ See Case No. 2010-00095.

The Consortium for Energy Efficiency guidelines provide minimum energy efficiency standards for commercial HVAC equipment. The minimum energy efficiency standards may apply to SEER and/or EER, depending upon the needs of the energy efficiency program.

Table 9 Consortium for Energy Efficiency Commercial HVAC Tier 1 Guidelines

Equipment	System Type	SEER	EER	HSPF
Central Air Conditioner	Split System	14	12	n/a
Central Air Conditioner	Single Package	14	11.6	n/a
Heat Pump	Split System	14	12	8.5
Heat Pump	Single Package	14	11.6	8

Of the 21 heat pump systems rebated by Kentucky Power,

- 8 met the SEER, EER and HSPF guidelines.
- 9 met the SEER and HSPF guidelines.
- 1 met only the EER guideline.
- 1 met only the HSPF guideline.
- 2 did not provide adequate efficiency information (1 was missing HSPF information but did not meet the EER or SEER guidelines and 1 was missing EER and HSPF but met the SEER guideline).
- A split heat pump was rebated at \$300 although the unit was 48,000 Btu/h and should have been rebated at \$450.

Of the 3 central air conditioner systems rebated by Kentucky Power,

- 1 met only the SEER guideline.
- 1 did not the guidelines.
- 1 did not provide efficiency information.

There were 101 HVAC dealers participating in the Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program and HVAC Diagnostic and Tune-Up Program. In 2010 and 2011, 23 out of 101 participating HVAC dealers participated in at least one of the programs.¹⁰ Of these, 8 received a rebate for installing an efficient HVAC system. One dealer performed 54 percent of the small commercial heat pump/air conditioner system installations.

¹⁰ The 101 participating HVAC dealers may also participate in the Residential Heat Pump/Air Conditioner Program. However, the Residential Heat Pump/Air Conditioner Program was not evaluated and these results pertain only to the HVAC Diagnostic and Tune-up Program and Small Commercial Heat Pump/Air Conditioner Program.

Table 10 Most Active Participating HVAC Dealers

Contractor	HVAC Systems	
	Rebated	% of Total
Breathitt Mechanical	13	54%
Appalachian Refrigeration	3	13%
Cadco Heating & Air Conditioning	2	8%
Kentucky Wide Heating & Cooling	2	8%
Elliot Supply & Glass, Inc	1	4%
Buckner HVAC	1	4%
Yoders Htg & Cooling	1	4%
Howard Htg & Cooling	1	4%
Total	24	100%

4.3 Program Marketing

Kentucky Power marketed the programs in conjunction with the HVAC Diagnostic and Tune-Up Program as part of a broader initiative under Kentucky Power's GRID SMART® Programs. Kentucky Power marketed the program to residential and small commercial customers as well as HVAC dealers within the KPCO service territory. Customers could search for participating HVAC dealers by geographic location on the KPCO SMART Programs website.

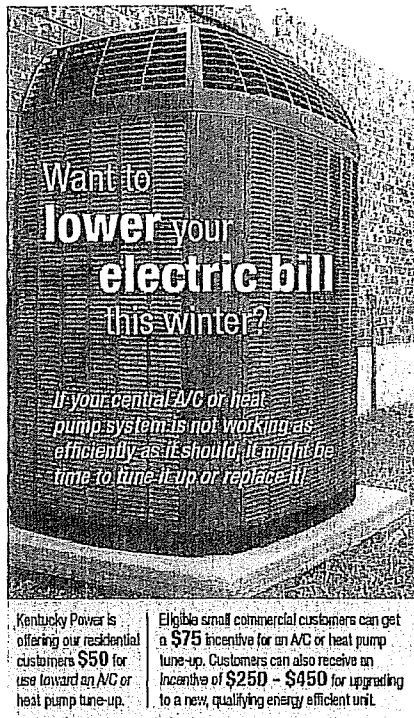
The participating dealers and potential participant pool were the same for both the Small Commercial HVAC Diagnostic and Tune-Up Program and the Small Commercial Heat Pump/Air Conditioner Incentive Program; therefore, these programs were marketed together.

In 2010 and 2011, Kentucky Power marketed the program through the following program outputs:

- **HVAC Dealer Outreach.** Kentucky Power staff promoted the programs directly to HVAC dealers. Outreach included mailing program fact sheets and telephoning or personally meeting with prospective dealers to discuss the programs.
- **Bill Inserts** were included in residential and small commercial customer bills in July and November 2011.
- **Newspaper Advertisements** were run in fifty media outlets during the fall and summer of 2011.
- **Community Events.** KPCO staff members attended community events in multiple counties, promoting the DSM Programs and distributing program fact sheets and CFLs. Overall, these events were attended by 400 to 450 residential customers per event.
- **Internet.** Kentucky Power markets the program through kentuckypower.com/save
- **KPCO Employee Communications.** Posters and email blasts are utilized to help KPCO employees become more familiar with the DSM Programs. KPCO employees are encouraged to promote programs when in the local community.

Participating HVAC dealers increased by approximately 10 percent after the newspaper advertisements were run due to customer interest in the program.

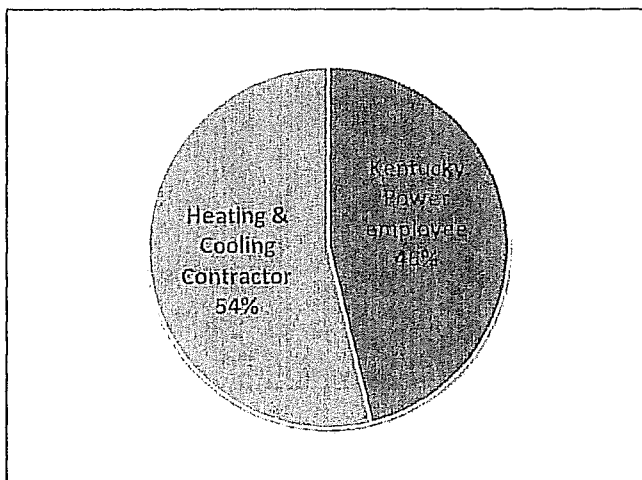
Figure 5 Newspaper Advertisement



4.3.1 Program Awareness

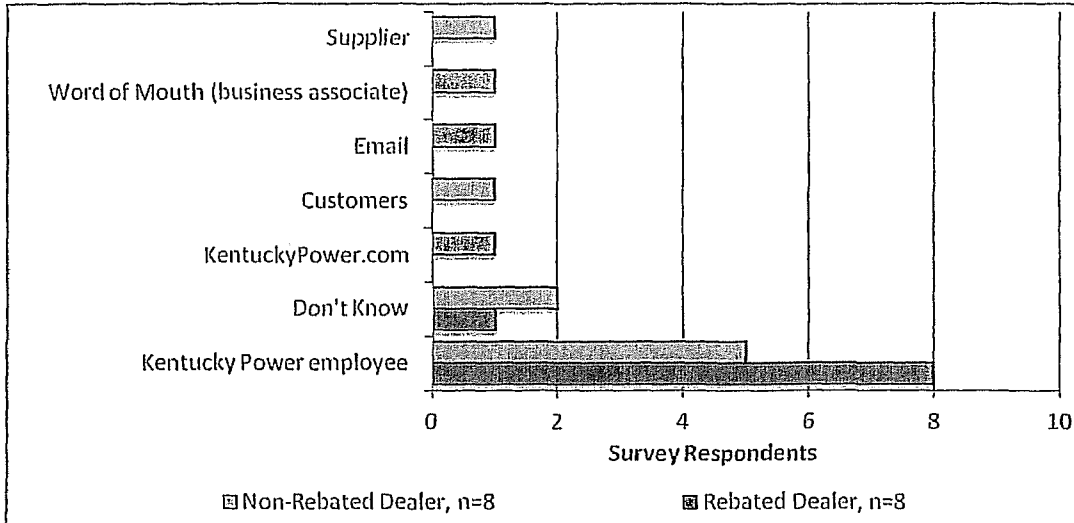
According to survey respondents, customers most often learned of the program from the heating and cooling contractor, followed closely by Kentucky Power. Kentucky Power refers to participating heating and cooling contractors as 'participating HVAC dealers.' Only 1 survey respondent reported that they learned of the program from the participating HVAC dealer. The remaining 6 respondents told the interviewer that they learned of the program from a 'heating and cooling contractor.'

Figure 6 How Customers First Learned of the Program, n=13



Participating HVAC dealers most often learned about the program through a Kentucky Power employee. Participating dealers that did not receive a rebate in 2011 noted other means, such as word of mouth, email and KentuckyPower.com.

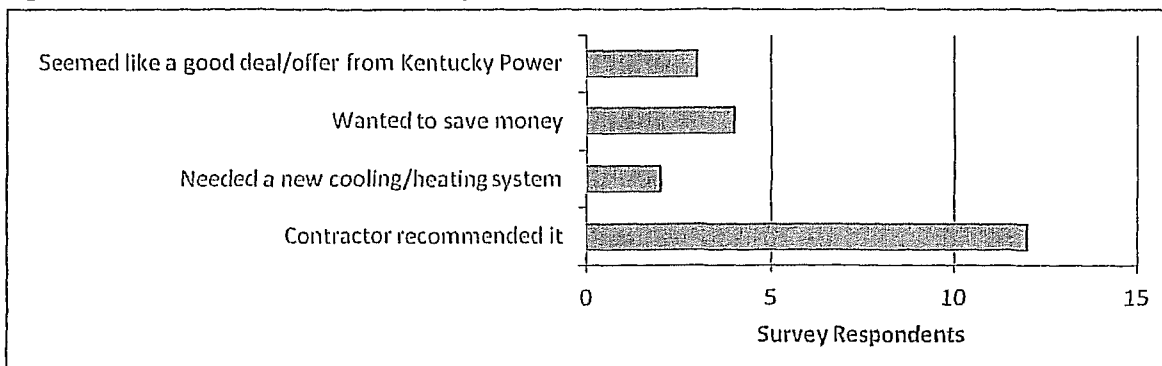
Figure 7 How Participating HVAC Dealers First Learned of the Program



4.3.2 Motivation for Participation

Ninety-two (92) percent of participating customers surveyed cited that their primary reason for participating in the Small Commercial Heat Pump/Air Conditioner Incentive Program was that the contractor recommended it. Additionally, 77 percent of participating customers noted that information from the contractor was a crucial factor in their decision to purchase and install the efficient equipment. The Small Commercial Heat Pump/Air Conditioner Incentive Program was designed such that the Kentucky Power program staff marketed the program to HVAC dealers. In turn, the participating HVAC dealers were encouraged, and expected, to promote the program to eligible customers.

Figure 8 Customer Motivation for Participation, n=13



According to participating HVAC dealers surveyed (n=7), the main factors motivating customer participation were:

- Energy savings (38%)
- Bill savings (31%)
- Comfort (15%)
- Environmental issues (8%)
- The customer's bottom line (8%)¹¹

Ninety-two (92 percent) of participating HVAC dealers surveyed stated that their primary reason for participating in both the KPCO Small Commercial Heat Pump/Air Conditioner Incentive Program and the HVAC Diagnostic and Tune-up Program was that the programs were good for customers. Participating HVAC dealer rebates were also a significant motivator.

According to the 7 participating HVAC dealers surveyed, 57 percent of HVAC dealers noted that the dealer incentive was very important in their decision to participate.

4.4 Program Tracking & Incentive Processing

Kentucky Power submitted bi-annual reports to the Kentucky PSC with each program's progress to-date, including participation, estimated energy and demand savings, and budget. The utility also reviewed actual, projected and summary program data with the DSM Collaborative on a quarterly basis.

Customer rebate applications were processed by Kentucky Power program staff. Staff reviewed the applications for completeness and eligibility of the customer/dealer. Applications were reviewed based on the date received and the DSM Program. Each customer application was assigned a unique identifier. The hard-copy rebate applications were labeled with the assigned unique identifier and payment request number then grouped and stored into a binder.

Kentucky Power's program tracking system was comprised of three databases:

KCPO Customer Records (MACCS) is an internal intranet-based database. A note is entered in the customer record with the DSM Program and the date the rebate application was received. KPCO Customer Service Representative's can access the note if a customer calls about their rebate status. Data from the rebate application is entered into the DEMO page, including the equipment type, tonnage, date, square footage of home. KPCO program staff utilizes the data to monitor program performance.

Program Log is an Excel-based database that contains data from the rebate application. The database is available on a shared drive, only to specific KPCO staff. Each KPCO DSM Program has a program log, containing data from the rebate application. Kentucky Power collects the following data:

- Customer Information: name, account number, address (service and mailing), unique identification number, phone number, contact person, peak billing demand, total square

¹¹ The customer's bottom line is financial (i.e. the financial benefit of purchasing and installing the efficient equipment and participating in the Kentucky Power program outweighed the cost of the service).

footage of A/C equipment zone, weekly hours of operation, whether there is a programmable thermostat/controls.

- Dealer Name
- Cooling/Heating Unit Information
 - Equipment type, size, efficiency level (SEER, EER & HSPF), brand and ARI reference number.
 - Model number of outdoor condenser, indoor evaporator and furnace.

Electronic Payment Request (PeopleSoft). Each rebate application has two payment requests, one for the customer and one for the dealer. The payment request includes the accounting code, unique identification number, customer/dealer name and address, dealer Federal Tax ID and rebate amount.

Prior to approval, the Electronic Payment Request was reviewed by the Kentucky Power program coordinator. The coordinator ensured the account number, program account, rebate amount and unique identifier were correct. Once approved, the Electronic Payment Request was submitted electronically to the AEP Accounting Group in Canton, Ohio and a rebate check issued and mailed.

4.5 Program Satisfaction

Overall, participants and HVAC dealers were very satisfied with the Small Commercial Heat Pump/Air Conditioner Incentive Program.

4.5.1 Participating Customer Satisfaction

Ninety-two (92) percent of customers surveyed would recommend their contractor to someone else, 18 percent had already recommended them (see Figure 9). All participating customers surveyed would recommend the program to others. As shown in Figure 10, participants noted that the efficient equipment saves money and participation in the program is simple.

Figure 9 Reasons Participants Would Recommend the Contractor, n=13

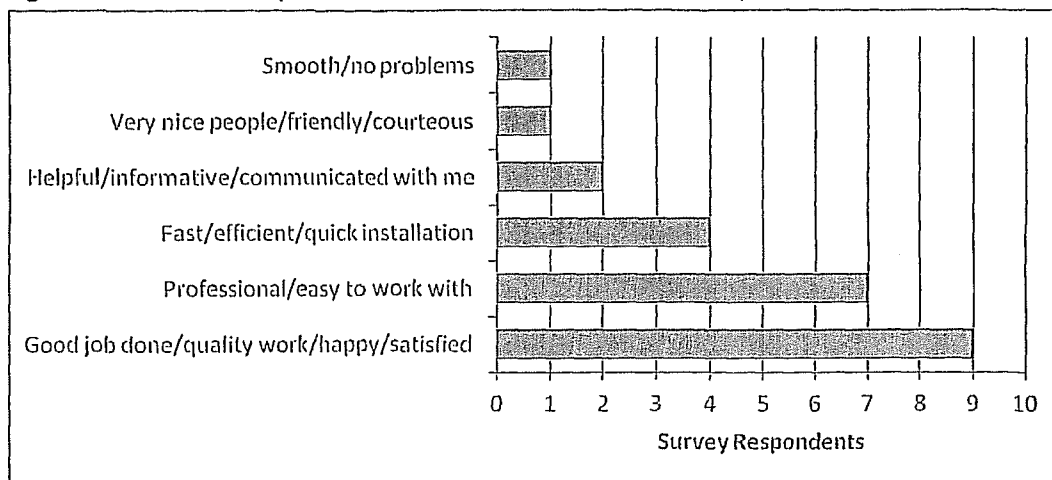
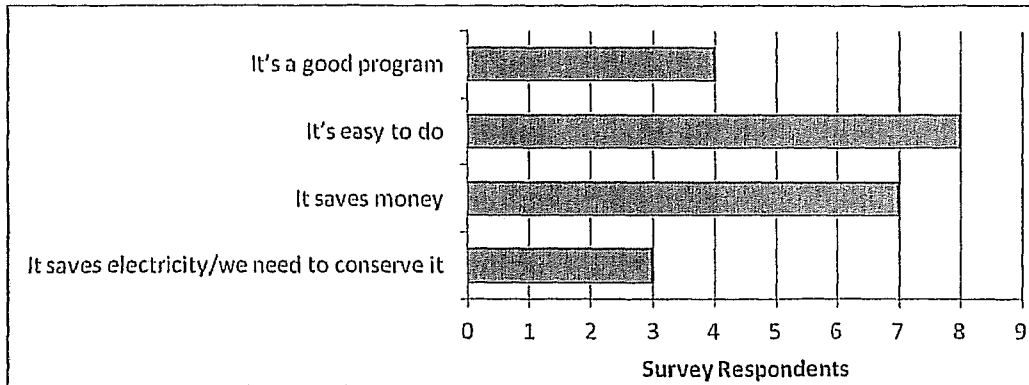
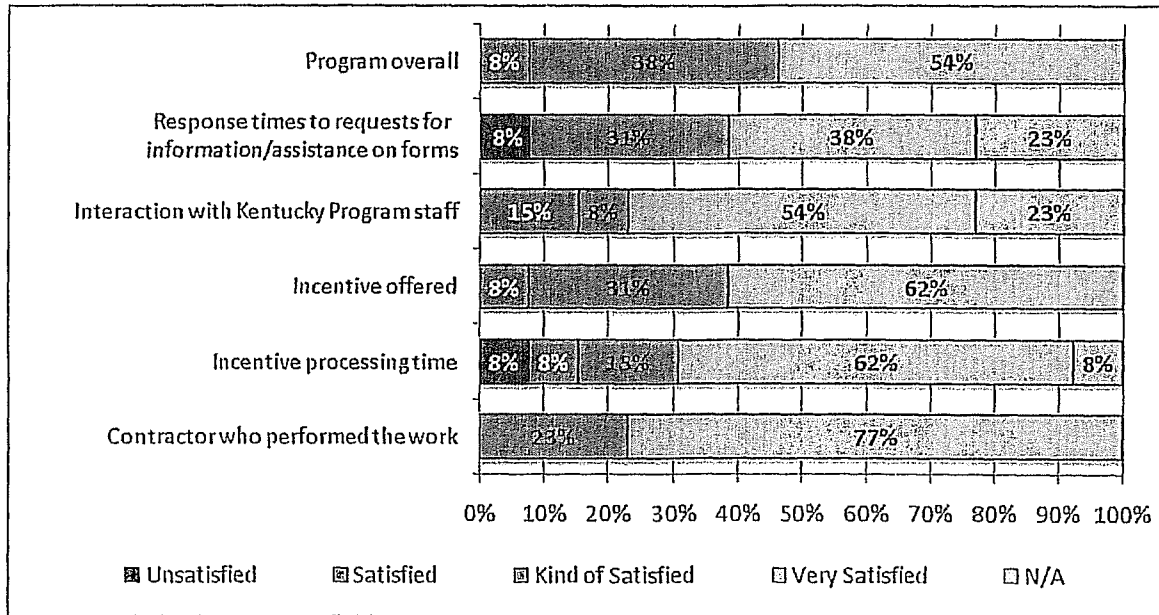


Figure 10 Reasons Participant Would Recommend the Program, n=13



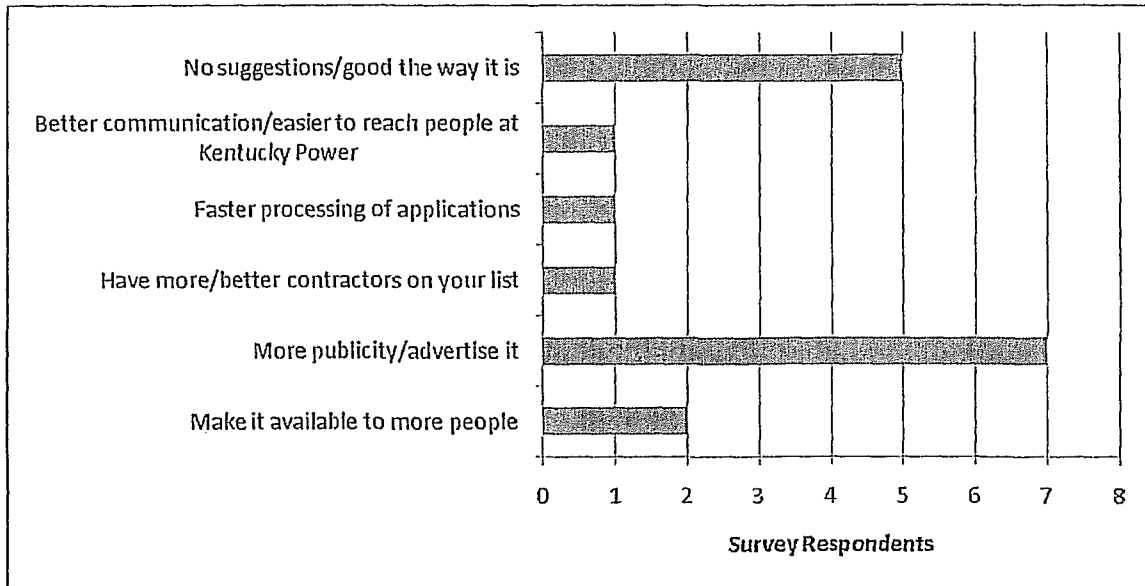
Based on the participant survey, participants are very satisfied with the contractor, the incentive offered and the incentive processing time. The areas that may be improved include response times to information requests/assistance with rebate forms and interaction with Kentucky Power program staff.

Figure 11 Participant Satisfaction with the Program, n=13



Most participating customers surveyed felt that the Small Commercial Heat Pump/Air Conditioner Incentive Program is good the way it is. However, participants suggested increased publicity and advertising.

Figure 12 Participant Suggestions for Program Improvement, n=13



4.5.2 Participating Dealer Satisfaction

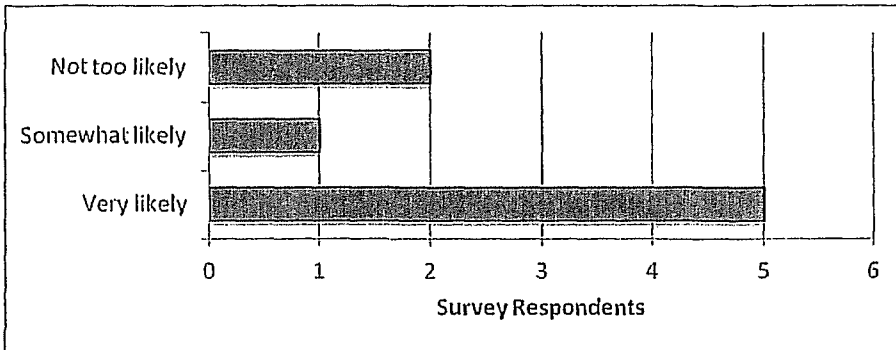
HVAC dealer participation was a key element to the Small Commercial Heat Pump/Air Conditioner Incentive Program. Participating HVAC dealers promoted the program to eligible customers and installed the efficient heat pumps/air conditioners. Seventy-seven (77) percent of participants surveyed noted that the HVAC dealer provided information that was a crucial factor in deciding to purchase and install the efficient equipment.

In 2010 and 2011, 23 out of 101 participating HVAC dealers received a rebate for participating in the HVAC Diagnostic and Tune-Up Program or the Small Commercial Heat Pump/Air Conditioner Program.¹² AEG conducted surveys of eight dealers that did not submit a rebate in 2011. According to these dealers, there were a variety of reasons for not submitting a rebate application, ranging from an illness causing a drop in work to not having many KPCO customers. Sixty-three (63) percent of these dealers think that it is very likely that they will submit a rebate application in 2012.

According to 86 percent of participating HVAC dealers surveyed, it is very likely that program participation will increase in 2012.

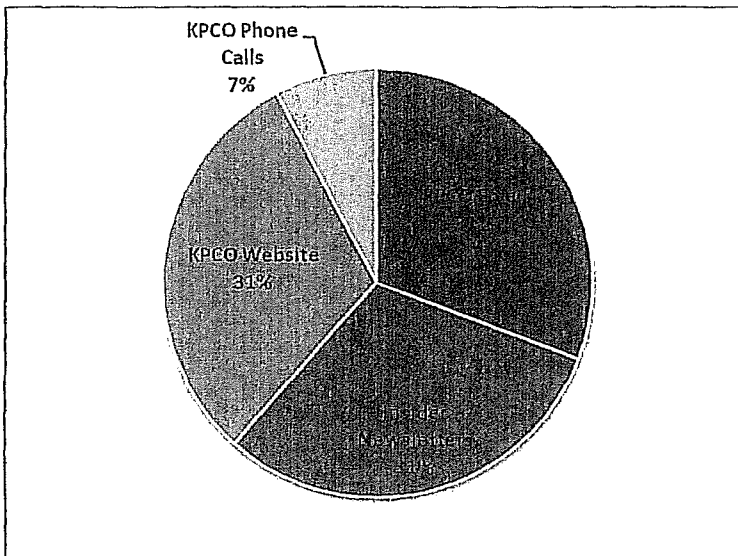
¹² The 101 participating HVAC dealers may also participate in the Residential Heat Pump/Air Conditioner Program. However, the Residential Heat Pump/Air Conditioner Program was not evaluated and these results pertain only to the HVAC Diagnostic and Tune-up Program and Small Commercial Heat Pump/Air Conditioner Program.

Figure 13 Likelihood of Non-Participating HVAC Dealer Submitting Rebate in 2012, n=8



It is very important to HVAC dealers that they are listed on the KPCO website as a participating dealer. Participating dealers prefer being notified of program updates via email, the KPCO program website and newsletters rather than via a phone call.

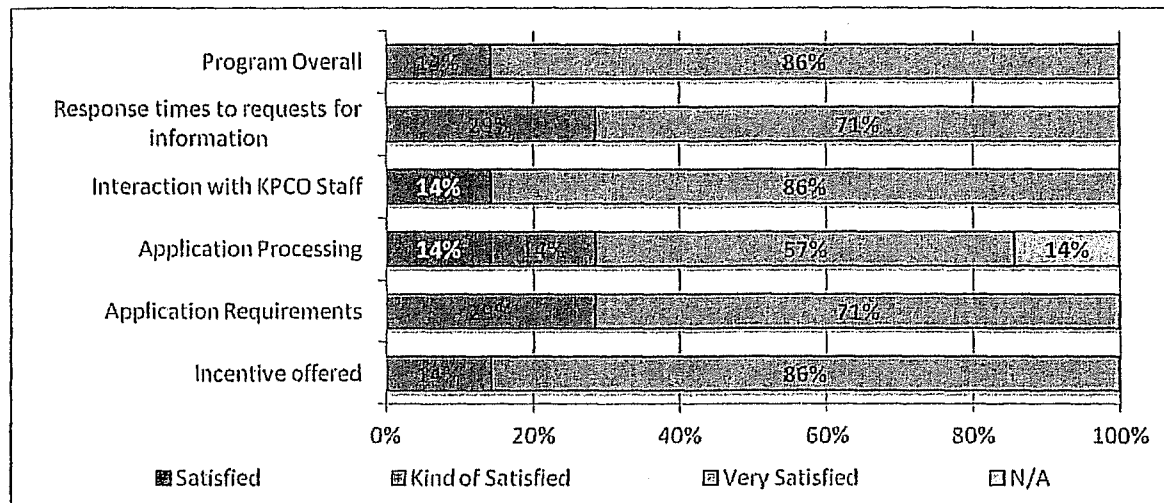
Figure 14 Participating HVAC Dealer Preferred Contact Medium, n=7



The participating HVAC dealers surveyed are satisfied with the program. The areas that may be improved include HVAC dealer interaction with KPCO program staff and application processing. Participating HVAC dealers recommended additional advertising and 'getting the information out.'

According to the HVAC dealers, the Small Commercial Heat Pump/Air Conditioner Incentive Program was good for business.

Figure 15 Participating HVAC Dealer Satisfaction with the Program, n=7



5. Impact Evaluation Findings

Impact evaluations verify the energy and demand savings directly associated with a program and assess the cost-effectiveness of the DSM program.

5.1 Gross Energy and Demand Savings

AEG determined the gross energy and demand savings of each individual project based on the International Performance Measurement and Verification Protocols ("IPMVP") Option A. Option A involves engineering calculations of gross savings using historical data. Engineering calculations referenced from the *State of Illinois Technical Reference Manual*, using Kentucky Power specific inputs, were utilized to calculate gross energy and demand impacts. Gross impacts were calculated for central air conditioners and heat pumps rebated.

The equations used to determine gross energy impacts for central air conditioners ("CAC") are:

$$CAC \text{ Gross Energy Impacts} = \text{Tons} \times \left(\frac{12}{SEER_b} - \frac{12}{SEER_e} \right) \times EFLH_c$$

$$CAC \text{ Gross Demand Impacts} = \text{Tons} \times \left(\frac{12}{EER_b} - \frac{12}{EER_e} \right) \times CF$$

The equations used to determine gross energy impacts for heat pumps ("HP") are:

$$HP \text{ Gross Energy Impacts} = \frac{kBtu}{h} \times \left(\frac{1}{HSPF_b} - \frac{1}{HSPF_e} \right) \times EFLH_h + \frac{kBtu}{h} \times \left(\frac{1}{SEER_b} - \frac{1}{SEER_e} \right) \times EFLH_c$$

$$HP \text{ Summer Demand Impacts} = \frac{kBtu}{h} \times \left(\frac{1}{EER_b} - \frac{1}{EER_e} \right) \times CF$$

$$HP \text{ Winter Demand Impacts} = \frac{kBtu}{h} \times \left(\frac{1}{HSPF_b} - \frac{1}{HSPF_e} \right) \times CF$$

Where:

- Tons* = capacity of equipment in tons of cooling capacity
- kBtu/h* = capacity of equipment in kBtu per hour
- SEER_b* = Seasonal Energy Efficiency Ratio of the baseline equipment
- SEER_e* = Seasonal Energy Efficiency Ratio of the energy efficiency equipment
- EER_b* = Energy Efficiency Ratio of the baseline equipment
- EER_e* = Energy Efficiency Ratio of the energy efficiency equipment
- HSPF_b* = Heating Seasonal Performance Factor of the baseline equipment
- HSPF_e* = Heating Seasonal Performance Factor of the energy efficiency equipment
- EFLH_c* = cooling mode equivalent full load hours
- EFLH_h* = heating mode equivalent full load hours
- CF* = coincidence factor

Gross impacts were calculated for each individual heat pump and central air conditioner system rebated. Individual project gross impacts and total gross impacts by equipment type are detailed in the tables below.

Table 11 Gross Savings per Unit, 2011

Measure	Number of Units	Gross Summer Savings per Unit (kW)	Gross Winter Savings Per Unit (kW)	Gross Energy Savings per Unit
Split HP 13 SEER 11 EER 4 Tons	1	0.00	0.59	1,189
Split HP 13 SEER 13 EER 3 Tons	1	0.22	0.44	892
Split HP 15 SEER 10.6 EER 2 Tons	2	0.00	0.29	860
Split HP 15 SEER 12.5 EER 3 Tons	1	0.09	0.36	992
Split HP 15 SEER EER 3 Tons	1	0.00	0.44	1,291
Split HP 15 SEER 12.5 EER 4 Tons	2	0.18	0.59	1,721
Split HP 15 SEER 12.5 EER 5 Tons	1	0.22	0.90	2,480
Split HP 15 SEER 12.5 EER 5 Tons	1	0.22	0.82	2,318
Split HP 15 SEER 13 EER 4 Tons	2	0.30	0.90	2,357
Split HP 15.75 SEER 13 EER 2.5 Tons	1	0.18	0.37	1,178
Split HP 16 SEER 11.1 EER 1.5 Tons	2	0.00	0.22	726
Split HP 16 SEER 10.6 EER 2 Tons	1	0.00	0.29	968
Split HP 17.5 SEER 10 EER 2.5 Tons	2	0.00	0.74	2,137
Split HP 19 SEER 11.2 EER 1.5 Tons	1	0.00	0.54	1,562
Packaged HP 13 SEER 7.7 EER 3 Tons	1	0.00	0.44	892
Packaged HP 14 SEER 11.5 EER 3.5 Tons	1	0.00	0.51	1,290
Split AC 13 SEER 11.5 EER 5 Tons	1	0.15	0.00	356
Packaged AC SEER EER 6 Tons	1	0.18	0.00	427
Packaged AC 14 SEER 11.5 EER 2 Tons	1	0.06	0.00	142

Table 12 Total Gross Demand and Energy Savings, 2011

Measure	Gross Summer Savings (kW)	Gross Winter Savings (kW)	Gross Energy Savings (kWh)
Heat Pumps	1.88	11.16	30,656
Central Air Conditioners	0.39	-	926
Program Total	2.27	11.16	31,582

5.2 Net Energy and Demand Savings

Net energy and demand savings are the gross savings attributable to the Small Commercial Heat Pump/Central Air Conditioner Incentive Program, not accounting for impacts resulting from other influences such as free ridership or spillover. Net impacts were calculated by applying a net-to-gross ("NTG") factor to gross impacts.

$$NTG \text{ Ratio} = 1 - \text{Free Ridership} + \text{Spillover}$$

Free ridership and spillover were gleaned from the HVAC Diagnostic and Tune-Up Program. The free ridership and spillover was not calculated from the participant survey for one primary reason, the Small Commercial Heat Pump/Central Air Conditioner Incentive Program offers rebates to eligible customers to encourage the purchase and installation of more efficient, higher cost HVAC equipment. However, approximately 60 percent of the HVAC equipment rebated did not meet the Consortium for Energy Efficiency Tier 1 energy efficiency guidelines. Additionally, the program had low participation and a statistically valid sample consisted of 13 participants. Therefore, the participant survey does not accurately represent the importance of the incentive (an indicator of free ridership) to a participant that met the energy efficiency guidelines and paid a higher cost for the more efficient HVAC equipment. Additionally, the survey does not accurately reflect the additional efficient activities (an indicator of spillover) of a participant that met the energy efficiency guidelines.

As a result, the HVAC Diagnostic and Tune-Up Program net-to-gross ratio of 78 percent for small commercial participants was applied to the Small Commercial Heat Pump/Central Air Conditioner Incentive Program. As a comparison, Black Hills Colorado utilizes a net-to-gross ratio of 80 percent for small commercial heat pumps and air conditioners. Table 14 presents the net demand and energy savings achieved.

Table 13 Net Demand and Energy Savings per Unit, 2011

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)
Heat Pumps	78%	1.469	8.708	23,912
Central Air Conditioners	78%	0.305	-	722
Program Total		1.774	8.708	24,634

5.3 Program Site Inspections and Installation Verification

AEG performed site inspections and installation verifications on eight fully installed projects to ensure proper installation, perform quality assurance/quality control, and verify application information of the installed equipment.

Installations of both heat pumps and central air conditioners were inspected with building types including medical offices, retail showrooms, churches, and hotels. The sites inspected provided a representative sample of all program projects. Proper installation verification was confirmed at all locations. Table 15 describes the building and unit type for sites visited.

Table 14 Installation Verification Site Visits, 2011

Building type	Unit Type
Medical Office	15 SEER Heat Pump
Retail Showroom	17.5 SEER Heat Pump
Retail Showroom	17.5 SEER Heat Pump
Medical Office	14 SEER Heat Pump
Medical Office	15 SEER Heat Pump
Hotel	13 SEER CAC
Retail Store	13 SEER Heat Pump
Church	15 SEER Heat Pump

5.4 Program Cost-Effectiveness

Cost-effectiveness analysis compares the costs and benefits of efficient equipment with those of baseline (non-efficient) equipment. Cost-effectiveness analysis indicates whether the efficient technology(s) improve a customer's financial position, decreases overall energy costs to ratepayers, or raises society's well-being. A program is considered cost-effective if the benefit-cost ratio is greater than 1.0.

AEG analyzed the cost-effectiveness of the Small Commercial Heat Pump/Air Conditioner Program utilizing four standard cost-effectiveness tests taken from the California Standard Practices Manual.¹³ Each test analyzes cost-effectiveness from a different perspective and answering a separate question:

- **Participant Cost Test:** Compares customer costs and benefits of installing the measure. Will the participant benefit over the life of the measure?
- **Program Administrator Cost Test (Utility Cost Test):** Comparison of program administrator costs to supply-side resource benefits. Will utility costs to save energy be less than utility costs to deliver the same amount of energy?
- **Ratepayer Impact Measure:** Measures the impact of the DSM program on utility rates if rates were to be adjusted to account for the program. Comparison of utility program costs and bill reductions associated with energy savings to supply-side resource benefits. Will customer rates increase?
- **Total Resource Cost Test:** Comparison of program administrator and customer costs to utility resource savings. Will the total costs of energy in the utility service territory decrease?

Results from the impact evaluation, utilizing IPMVP best practices, are utilized in the four cost-effectiveness tests taken from the California Standard Practices Manual.

Kentucky Power specific inputs, including avoided costs, discounts rates, participation and incentives, were used to conduct the cost-effectiveness analysis. Bencost, an updated version of a public domain model that AEG customized for Kentucky Power, was utilized to perform the cost-effectiveness modeling (see Appendix D). Bencost is an input-output model that calculates all four cost-effectiveness

¹³ The California Standard Practices Manual details cost-effectiveness guidelines and procedures for standardized cost-effectiveness evaluations.

tests. All program costs and benefits are discounted to present-day dollar values in order to accurately compare future benefits with current costs.

Table 15 Cost-Effectiveness Results, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Ratepayer Impact Measure Test	0.37	\$48,879	\$18,032	-\$30,847
Utility Cost Test	0.75	\$23,966	\$18,032	-\$5,934
Participant Cost Test	3.01	\$8,068	\$24,266	\$16,198
Total Resource Cost Test	0.76	\$23,634	\$18,032	-\$5,602

It needs to be noted that very low avoided costs, especially the extremely low capacity costs in the Kentucky Power service territory, have a significant negative impact on the program's cost-effectiveness. The 2012 Kentucky Power capacity cost is \$6/kW-year, compared to a PJM average of over \$100/kW-year. This cost differential partially accounts for the low benefit-cost ratios.

The Small Commercial Heat Pump/Air Conditioner Program's cost-effectiveness was also greatly affected by the low participation rates in the program. In 2011, Kentucky Power rebated 21 heat pumps, achieving 53 percent of the revised 40 participant goal, and 3 central air conditioners, achieving 12 percent of the revised 25 participant goal. The low participation greatly affects the program savings while many program costs were constant. Program administration, marketing, and evaluation costs remain constant independent of program participation. If the planned participation levels were achieved, the program would be cost-effective and pass the TRC test. Table 17 provides the cost-effectiveness if full program participation was achieved.

Table 16 Cost-Effectiveness Results if Planned Participation Achieved, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Ratepayer Impact Measure Test	0.47	\$96,543	\$45,343	-\$51,200
Utility Cost Test	1.34	\$33,816	\$45,343	\$11,527
Participant Cost Test	2.56	\$22,750	\$58,198	\$35,448
Total Resource Cost Test	1.18	\$38,316	\$45,343	\$7,027

Going forward, reaching participation goals in the Small Commercial Heat Pump/Air Conditioner Program is vital to reaching acceptable cost-effectiveness levels. If administrative expenses stay consistent, the participation cost effective break-even point for the program is 30 heat pump participants and 15 air conditioner participants.¹⁴ Also, in the Kentucky Power service territory heat pumps have shown to be more cost-effective than central air conditioners. Because of this, there should be more focus on driving heat pump participation in the program. If participation goals are achieved, especially for heat pumps, the program will be cost-effective and have a positive impact on the Kentucky Power service territory.

Although the Small Commercial Heat Pump/Air Conditioner Program did not have a cost-effectiveness ratio greater than 1.0, the entire portfolio being evaluated is cost-effective in 2011. Table 16 provides

¹⁴ Note: for each additional heat pump participant, the cost-effectiveness will increase from the break-even point.

the cost-effectiveness for the 2010-2012 Demand Side Management Program Portfolio being evaluated by AEG.¹⁵

Table 17 Kentucky Power Portfolio Cost-Effectiveness Results, 2011

Test	B/C Ratio	Total Costs	Total Benefits	Net Benefits
Utility Cost Test	2.13	\$720,104	\$1,533,730	\$813,626
Ratepayer Impact Measure Test	0.44	\$3,507,956	\$1,533,730	-\$1,974,227
Participant Test	5.13	\$486,703	\$2,499,101	\$2,012,397
Total Resource Cost Test	1.57	\$975,217	\$1,533,730	\$558,512

6. Key Findings and Recommendations

6.1 Summary of Key Findings

The Small Commercial Heat Pump/Air Conditioner Program is designed to encourage the purchase of energy efficiency central air conditioners and heat pumps identified by the U.S Department of Energy, the U.S. Environmental Protection Agency and/or the Consortium for Energy Efficiency as being influential in energy efficiency. The program helps lower customer electric bills and allows KPCO to utilize its existing generating capacity more efficiently, thereby deferring or delaying the need for new generation.

6.1.1 Program Performance Indicators

In 2011, Kentucky Power rebated 24 small commercial central air conditioners and heat pumps through the Small Commercial Heat Pump/Air Conditioner Incentive Program at a much higher cost per unit than originally budgeted (\$980 versus \$575). The higher cost per participant may be attributed to the high fixed costs associated with promotional and evaluation activities that were in independent of program participation.

Eighty-eight (88) percent of the systems installed were heat pumps and 13 percent were central air conditioners. The program was approved in August 2010, two months later than anticipated in the Kentucky PSC filing, and implemented in September. The first rebate was issued in April 2011. KPCO reached 53 percent of the revised 40 heat pump participant goal and 12 percent of the revised 25 air conditioner participant goal.

Table 18 2011 Program Participation, Actual and Goals

	Actual	Original Goal	Revised Goal
Heat Pump	21	20	40
Central Air Conditioner	3	100	25
Total	24	120	65

¹⁵ The 2010-2012 Demand Side Management Program Portfolio being evaluated includes the Small Commercial Heat Pump/Air Conditioner Program, Residential Efficient Products Program, Commercial Incentive Program, and Residential and Small Commercial HVAC Diagnostic and Tune-Up Program.

In 2010 and 2011, 23 out of 101 participating HVAC dealers participated in the HVAC Diagnostic and Tune-Up Program or Small Commercial Heat Pump/Air Conditioner Incentive Program. One dealer performed 54 percent of the small commercial heat pump/air conditioner installations. The HVAC dealers surveyed noted that the KPCO dealer incentives and being listed on the KPCO website as a participating dealer were significant motivators for participation.

6.1.2 Program Tracking

Kentucky Power's program tracking system is comprised of three databases. The program log tracks all rebate application data, including customer information, dealer name and HVAC system data. The CEE guidelines provide minimum energy efficiency standards for commercial HVAC equipment. The minimum energy efficiency standards may apply to SEER and/or EER, depending upon the needs of the energy efficiency program.

Of the 21 heat pump systems rebated by Kentucky Power, 17 met the CEE Tier 1 SEER/EER and HSPF guidelines. Two (2) systems did not meet the guidelines and 2 had inadequate system efficiency information. Of the 3 central air conditioner systems rebated by Kentucky Power, 1 met the CEE Tier 1 SEER/EER guidelines. One (1) did not meet the guidelines and 1 had inadequate system efficiency information.

6.1.3 Program Awareness and Marketing Strategies

The marketing strategy for the program included a combination of Kentucky Power program staff and participating HVAC dealers. KPCO staff promoted the programs directly to HVAC dealers through fact sheets, calls and meeting-in person to discuss the program. In turn, the participating dealers were expected to promote the program to eligible customers. Additional marketing activities included direct mail, fact sheets, bill inserts, newspaper advertisements and community events.

According to survey respondents, customers most often learned of the program from the heating and cooling contractor (54%) followed closely by a Kentucky Power employee (46%). Ninety-two (92) percent of participating customers surveyed noted that information from the contractor was a crucial factor in their decision to purchase and install efficient HVAC equipment. Participating customers and HVAC dealers surveyed noted that the program would benefit from increased publicity and advertising.

6.1.4 Best Practices

Kentucky Power's program design and processes are consistent with industry standards that are considered best practice for similar programs. Given the nascent stage of Kentucky Power's program it is commendable that the program has received the level of support from the contractor community and satisfaction recognition from participating customers. The majority (approximately 72%) of energy efficiency programs targeted at commercial customers provide customer incentives for unitary HVAC equipment.¹⁶

The challenges posed by lack of information are ubiquitous in energy efficiency programs. Investment in education and outreach boost awareness of the benefits of energy efficiency. Successful marketing

¹⁶ Consortium for Energy Efficiency (2012). State of the Efficiency Program Industry: Budgets, Expenditures and Impacts 2011.

strategies can increase program participation. Actively engaging key stakeholders, such as HVAC contractors or home/business owners, is crucial to the success of any energy efficiency program. Typically, programs will feature periodical stakeholder advisory meetings or other formal outreach that encourages participation and provides valuable feedback throughout the program.

Many energy efficiency programs suffer from lack of staff resources. Additional staff personnel may be necessary to ensure that program goals are met and that the program delivers the intended results. The increased program costs of additional staff are often recouped by improved performance.

6.1.5 Verify Program Impacts

The net-to-gross ratio is estimated at 78 percent, with 27 percent free ridership and 5 percent spillover. Program cost-effectiveness was greatly affected by low participation rates and program administration, marketing and evaluation costs that remained constant independent of program participation. If administrative expenses stay consistent, the cost-effective break-even point is 30 heat pump participants and 15 air conditioner participants. Heat pumps have shown to be more cost-effective than central air conditioners. If participation goals are achieved, especially for heat pumps, the program will be cost-effective and have a positive impact on the Kentucky Power service territory.

Table 19 Energy Savings, 2011

Measure	NTG Ratio	Net Summer Savings (kW)	Net Winter Savings (kW)	Net Energy Savings (kWh)	TRC
Program Total	78%	1.774	8.708	24,634	0.73

Installations of both heat pumps and air conditioners were inspected with building types including medical offices, retail showrooms, churches, and hotels. The sites inspected provided a representative sample of all program projects. Proper installation verification was confirmed at all locations.

6.2 Recommendations

AEG has several recommendations on how to improve the program. These include:

6.2.1 Hire Implementation Contractor

AEG recommends that Kentucky Power hire an implementation contractor to implement Kentucky Power's residential and small commercial HVAC programs, including, but not limited to, the Small Commercial Heat Pump/Air Conditioner Incentive Program, the Residential and Small Commercial HVAC Diagnostic and Tune-Up Program, the Residential High Efficiency Heat Pump Program, Mobile Home High Efficiency Heat Pump, and Mobile Home New Construction.

Kentucky Power has a small staff to run and oversee Kentucky Power's numerous energy efficiency programs. Some of the KPCO programs have implementation contractors that perform the day-to-day operations of the programs, but the residential and small commercial HVAC programs are run completely by KPCO staff. Therefore, KPCO staff is responsible for marketing and promotional activities, including visiting participating and potential HVAC dealers across the KPCO territory, processing rebate applications, tracking rebate applications and performing QA/QC inspections. Due to the limited

resources, Kentucky Power has not yet conducted an inspection to ensure services are being performed properly.

The residential and small commercial HVAC programs share many similar components, including marketing and promotional activities and data tracking systems as well as the same participating HVAC dealers. Utilizing one implementation contractor to implement the HVAC programs will allow the programs to continue capitalizing on their similarities and increase the efficiency of program processes.

The implementation contractor will have, at a minimum, the following responsibilities:

- Develop program goals and budget.
- Develop marketing and promotional activities.
- Design and maintain a data tracking system.
- Process customer and contractor rebate applications.
- Engage and monitor participating HVAC dealers.
- Develop QA/QC procedures and conduct random inspections of completed work.

Kentucky Power program staff and the implementation contractor should work with the Commercial Incentive Program implementation contractor to ensure that the Small Commercial Heat Pump/Air Conditioner Incentive Program does not compete with the Commercial Incentive Express Program. If it is determined that competition exists, the programs should be examined to determine if the Small Commercial HP/AC Incentive Program should be absorbed into the Commercial Incentive Express Program.

6.2.2 Program Modifications

AEG recommends that Kentucky Power clarify the program requirements. To receive a rebate, the HVAC systems must meet the CEE guidelines, which provide minimum energy efficiency standards for commercial HVAC equipment. The minimum energy efficiency standards may apply to SEER and/or EER, depending upon the needs of the energy efficiency program. Kentucky Power does not specify whether HVAC systems must meet both the SEER and EER requirements. AEG recommends that Kentucky Power and the implementation contractor consider modifying the program requirement, such that HVAC systems must meet the CEE Tier 1 SEER and HSPF guidelines. The Kentucky Power program website should be updated to reflect any program requirement modifications.

AEG recommends increasing rebate processing oversight conducted by Kentucky Power and the implementation contractor to ensure compliance with program requirements. In particular, oversight activities should ensure that HVAC equipment qualifies for a rebate and equipment efficiency data is correctly recorded and tracked. Of the 24 systems rebated, 3 did not meet the CEE Tier 1 guidelines and 3 had inadequate system efficiency information.

6.2.3 Engage Participating HVAC Dealers

AEG recommends that Kentucky Power and the implementation contractor actively engage participating HVAC dealers and remove non-participating HVAC dealers from the participating HVAC dealer list if they have not actively participated in a KPCO HVAC program within the most recent 12 months.

HVAC dealer participation is crucial to the program; 92 percent of survey respondents noted that information from the contractor was a crucial factor in their decision to purchase and install efficient HVAC equipment. There are currently 101 HVAC dealers participating in the HVAC programs. In 2010 and 2011, only 23 dealers participated in the HVAC Diagnostic and Tune-Up Program or the Small Commercial Heat Pump/Air Conditioner Incentive Program.

AEG recommends collaboration between Kentucky Power and the implementation contractor to engage contractors and explore modifying the marketing and promotional activities. Kentucky Power and the implementation contractor should explore cooperative marketing with the participating contractors to potentially leverage contractor's marketing experience. Cooperative marketing would be offered on a temporary basis and the impact on participation reviewed before permanent changes were made to the program.

Appendix A. Participating Dealer Survey Guide (a)

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's HVAC Diagnostic and Tune-Up Program and Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. I'd like to talk with you about your experience with the programs and get some feedback. This is **NOT** a sales effort, but for research purposes only. The survey should take about 10 minutes. All comments will remain confidential.

According to our records, you **ARE** currently participating in one or both of these programs as a participating dealer. Is that correct?

- Yes 1 (CONTINUE)
No 2 (THANK THEM FOR THEIR TIME AND END CALL)
Don't Know 3 (ASK TO SPEAK WITH SOMEONE KNOWLEDGEABLE ABOUT THE PROGRAM, THEN REPEAT INTRO)

If the dealer does not recall the program(s): "These programs provide incentives to residential and small business customers to purchase and install energy efficient HVAC equipment and/or receive diagnostic and tune-up service for their heating or cooling equipment."

Program Awareness and Participation

1. Which Kentucky Power program is your company involved with?
 - a) HVAC Diagnostic and Tune-Up Program (3)
 - b) Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program
 - c) Both (4)
2. How did you first learn about the program(s)? Mark all mentioned
 - a) Kentucky Power employee (7)
 - b) KentuckyPower.com
 - c) gridSMART
 - d) News Article
 - e) Customers
 - f) Email
 - g) Word of Mouth (business associates)
 - h) Trade Association
 - i) Supplier
 - j) Community event/meeting/presentation
 - k) Don't Know (1)
3. Why did you decide to participate in the program(s)?

"Good for customers" (6)
"It's a good way to help the customers." (1)
"Good outreach to customers (helps sell)" (1)
"Good for business." (1)
4. How long have you been involved in the program(s)? Read answer categories
 - a) Less than 1 Month
 - b) 1 – 3 Months
 - c) 4 – 6 Months (1)
 - d) More than 6 Months (4)

e) Unsure (2)

Program Performance

5. About how many projects have you completed for the....
 - a) HVAC Diagnostic and Tune-Up Program *(n/a)*
 - b) Small Commercial High Efficiency Heat Pump/Air Conditioner Program *(n/a)*
6. What type of equipment is installed/serviced *most frequently* under the....
 - a) HVAC Diagnostic and Tune-Up Program *("Heat Pump" 4)*
 - b) Small Commercial High Efficiency Heat Pump/Air Conditioner Program *("Heat Pump" 1)*
7. How influential have the customer program incentives been in moving projects forward in 2011?
 Read answers
 - a. Very influential *(2)*
 - b. Somewhat influential *(5)*
 - c. Not too influential
 - d. Not at all influential
8. About what percentage of your 2011 business can be attributed to the Kentucky Power programs?
"15 to 20 percent." (2)
9. Besides the customer incentive, what are the main factors driving program participation for customers? Read answers, mark all that apply
 - a) Energy savings *(5)*
 - b) Comfort *(2)*
 - c) Environmental issues *(1)*
 - d) The bottom line *(1)*
 - e) Other *"Bill Savings" (4)*
10. Thinking about the future, how likely is it that program participation will increase among customers in 2012? Read answer categories
 - a) Very likely *(6)*
 - b) Somewhat likely
 - c) Not too likely *(1)*
 - d) Not at all likely
11. Do you usually complete and submit the customer rebate form on the customer's behalf?
 - a) Yes *(6)*
 - b) No
"Not all the time"

Program Satisfaction

12. Please rate your satisfaction with the following program components on a five-point scale, where "1" means "Not at all satisfied" and "5" means "Very satisfied." How satisfied are you with the:

	1	2	3	4	5	Don't Know/Refused
a) Incentive offered				1	6	
b) Application Requirements				2	5	
c) Application Processing			1	1	4	
d) Interaction with Kentucky Power			1		6	
e) Response times to requests for information				2	5	
f) Program overall				1	6	

Comments (verbatim)

"Kentucky Power staff is hard to get in touch with"

13. How important was the dealer incentive in getting you to participate in the program? Read answers
- a) Very important **(4)**
 - b) Somewhat important **(2)**
 - c) Not too important **(1)**
 - d) Not at all important

14. What changes should be made to the program to make it more attractive to customers?

"Getting the information out."

"Less time to requalify, as of now there is a 3 year wait between services."

"Overall look at house instead of just heat pump."

Communication with Kentucky Power

15. How important is it to you that your company is listed on the Kentucky Power website as a participating program dealer? Read answers

- a) Very important **(6)**
- b) Somewhat important
- c) Not too important **(1)**
- d) Not at all important

16. What other types of marketing assistance from Kentucky Power would be helpful to your company in selling energy efficient equipment or services?

"Mail box stuffer" (1)

17. What is your preferred medium of contact from Kentucky Power for program updates or information about program? Read answers

- a) Emails from Kentucky Power **(4)**
- b) Insider newsletters **(4)**
- c) Kentucky Power website **(4)**
- d) Calls from Kentucky Power **(1)**

18. What are your primary sources of information on energy efficiency equipment and services?

- a) Online **(5)**
- b) Publications **(2)**
- c) Trade shows **(1)**
- d) Other *"Magazines"* **(1)**

Dealer Demographics

Finally, I'd like to ask you a couple of questions about your business.

19. How long have you been in business?

20. How many employees do you have?

Thank you for taking the time to answer my questions.

Appendix B. Participating Dealer Survey Guide (b)

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's HVAC Diagnostic and Tune-Up Program and Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. I'd like to talk with you about your experience with the programs and get some feedback. This is NOT a sales effort, but for research purposes only. The survey should take about 10 minutes. All comments will remain confidential.

According to our records, you ARE a Kentucky Power participating dealer. Is that correct?

- Yes 1 (CONTINUE)
No 2 (THANK THEM FOR THEIR TIME AND END CALL)
Don't Know 3 (ASK TO SPEAK WITH SOMEONE KNOWLEDGEABLE ABOUT THE PROGRAM, THEN REPEAT INTRO)

If the dealer does not recall the program(s): "These programs provide incentives to residential and small business customers to purchase and install energy efficient HVAC equipment and/or receive diagnostic and tune-up service for their heating or cooling equipment."

Program Awareness and Participation

1. How did you first learn about the program(s)? Mark all mentioned
 - a) Kentucky Power employee (5)
 - b) KentuckyPower.com (1)
 - c) gridSMART
 - d) News Article
 - e) Customers (1)
 - f) Email (1)
 - g) Word of Mouth (business associates) (1)
 - h) Trade Association
 - i) Supplier (1)
 - j) Community event/meeting/presentation
 - k) Don't Know (2)
2. Why did you decide to participate in the program(s)?

"Good program,/good program for customers" (6)
"Rebates" (1)
3. How long have you been involved in the program(s)? Read answer categories
 - a) Less than 1 Month
 - b) 1 – 3 Months
 - c) 4 –6 Months
 - d) More than 6 Months (8)

Program Performance

4. Do you perform HVAC diagnostic and tune-up services for residential or small commercial customers in Kentucky Power service territory?
 - a) Yes (7)
 - b) No (1)
5. Do you install energy efficient heat pumps or central air conditioners for small commercial customers in Kentucky Power service territory?

- a) Yes (7)
- b) No (1)

Continue If answered 'YES' to Q4 or Q5. Otherwise, go to Q8.

6. Why have you not submitted any rebate applications?

"Not many accounts with Kentucky Power." (1)

"The tune-ups are hard to do. The people do not feel like doing the paperwork." (1)

"Haven't had anyone who has wanted it yet." (1)

"We have" (2)

"Sick" (2)

"Not Sure" (1)

7. How likely do you think it is that your company will submit a rebate application in 2012? READ ANSWERS

- a) Very likely (5)
- b) Somewhat likely (1)
- c) Not too likely (2)
- d) Not at all likely

Dealer Demographics

Finally, I'd like to ask you a couple of questions about your business.

- 8. How long have you been in business?
- 9. How many employees do you have?

Appendix C. Participating Customer Survey Guide

Good morning/afternoon/evening, I'm _____ with Applied Energy Group. We are conducting a survey of Kentucky Power's Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. I'd like to talk with you about your impression of the program and get some feedback. This is NOT a sales effort, but for research purposes only. The survey should only take 10 minutes. All comments will remain confidential.

According to our records, you participated in the Small Commercial High Efficiency Heat Pump/Air Conditioner Incentive Program. Were you involved with the decision to participate in this program or is there someone else in your business that made that decision?

Involved with/made decision 1 (CONTINUE)

Someone else decided 2 (ASK TO SPEAK TO THAT PERSON, REPEAT INTRO)

If the customer does not recall the program: "The program provides rebates to customers who purchase a qualifying air conditioner or heat pump."

1. How would you classify your type of business? *Read answer categories*

- a) Big Box
- b) Restaurant
- c) Hotel **(1)**
- d) Office **(1)**
- e) Retail **(4)**
- f) Other (verbatim)

Church

Real Estate

Independent Company

Rental

Program Participation

2. What kind of efficient equipment did you have installed in your business as part of this program?

- a) Central air conditioner (go to Q3) **(1)**
- b) Heat Pump (go to Q4) **(5)**
- c) Both (ask Q3 & Q4) **(7)**

3. How many incentives did you receive for an efficient air conditioner?

- a) 1 **(9)**
- b) 2

4. How many incentives did you receive for an efficient heat pump?

- a) 1 **(8)**
- b) 2 **(1)**

5. How did you first become aware of the Small Commercial Heat Pump/Air Conditioner Incentive Program? *Indicate first mention*

- a) Participating HVAC Dealer **(7)**
- b) Kentucky Power employee **(7)**
- c) KentuckyPower.com
- d) News Article
- e) Email
- f) Kentucky Power Bill Insert

- g) Word of Mouth (Friend / Neighbor)
- h) Community event/meeting/presentation

Free Ridership

6. Prior to learning about this program, did you have specific plans to install a _____ [central air conditioner/heat pump]?
 - a) Yes **(13)**
 - b) No (go to Q9)
7. Was it necessary to change your plans to qualify for the program?
 - a) Yes **(3)**
 - b) No (go to Q9) **(10)**
8. What changes were made? *Probe for timing, quantity and efficiency*
9. How important was the Kentucky Power incentive in your decision to buy the efficient _____ [central air conditioner/heat pump]? *Read answer categories*
 - a) Very important **(4)**
 - b) Somewhat important **(2)**
 - c) Only slightly important **(3)**
 - d) Not important at all **(3)**
 - e) Don't know **(1)**
10. If you had not received the Kentucky Power incentive, how likely is it you would have purchased the exact same equipment? *Read answer categories*
 - a) Very likely **(8)**
 - b) Somewhat likely **(3)**
 - c) Not likely **(2)**
11. If you had not received the Kentucky Power incentive, how likely is it you would have purchased the exact same quantity of equipment? *Read answer categories*
 - a) Very likely **(7)**
 - b) Somewhat likely **(2)**
 - c) Not likely **(3)**
 - d) Don't know **(1)**

Spillover

12. Since receiving the Kentucky Power incentive, has your business purchased additional efficient heating or cooling equipment?
 - a) Yes
 - b) No (go to Q15) **(12)**
 - c) Don't know/refused **(1)**
13. What type of equipment have you purchased?
14. What influence did the Kentucky Power program have on the decision? *Read answer categories*
 - a) Had no influence **(4)**
 - b) Had some influence **(5)**
 - c) Had a large influence **(4)**

Program Awareness

15. Why did you decide to participate in the program? *Mark all that apply – DO NOT READ*
 - a) Contractor recommended it **(12)**
 - b) Needed a new cooling/heating system **(2)**
 - c) Wanted to save money **(4)**

- d) Seemed like a good deal/offer from Kentucky Power (3)
 - e) Wanted to save energy
16. Was the information you received from the HVAC dealer [or contractor] a crucial factor in the decision to install this high efficiency equipment at the time you did?
- a) Yes (10)
 - b) No (3)
17. About how long did it take to receive the incentive, from the time the equipment was installed until you received the rebate? *Read answer categories*
- a) Less than one month (7)
 - b) 4 to 6 weeks
 - c) 6 to 8 weeks (2)
 - d) More than 8 weeks (2)
 - e) Don't know/Refused (2)

Customer Satisfaction

18. Please rate your satisfaction with the following program components on a five-point scale, where "5" means "Very Satisfied" and "1" means "Very Dissatisfied." How satisfied are you with the:

	1	2	3	4	5	Don't Know	N/A
Contractor who performed the work				3	10		
Incentive processing time	1		1	2	8	1	
Incentive offered			1	4	8		
Interaction with Kentucky Program staff			2	1	7	2	1
Response times to requests for information/assistance on forms	1			4	5	2	1
Program overall			1	5	7		

19. Would you recommend this contractor to someone else?
- a) Yes (12)
 - b) No (1)
20. Why do you say that? *Mark all that apply*
- a) Good job done/quality work/happy/satisfied (9)
 - b) Professional/easy to work with (7)
 - c) Very nice people/friendly/courteous (1)
 - d) Helpful/information/answered my questions/communicated with me (2)
 - e) Fast/efficient/quick installation (4)
 - f) Smooth/no problems (1)
 - g) Timely/came when they said/finished on time
 - h) Good customer service overall
 - i) Have already recommended them (2)
 - j) They are the ones who told me about the program
 - k) Other (verbatim)
"Took a while for them to get the equipment installed"
21. Based on your experience with the program, would you recommend this program to others?
- a) Yes (13)
 - b) No
22. Why do you say that? *Mark all that apply*
- a) It saves electricity/we need to conserve it. (3)
 - b) It saves money. (7)

- c) It's easy to do. **(8)**
- d) It's a good program **(4)**
- e) I have recommended it
- f) People I recommended it to haven't been able to get into the program

23. How could the program be improved?

- a) Make it available to more people **(2)**
- b) More publicity/advertise it **(7)**
- c) Have more/better contractors on your list **(2)**
- d) Faster processing of applications **(1)**
- e) Explain the program/paperwork more
- f) Better communication/easier to reach people at Kentucky Power **(1)**
- g) No suggestions/good the way it is **(5)**

Thank you for taking the time to answer my questions!

Appendix D. Cost-Effectiveness Analysis Inputs

Table E1: General Bencost Model KPCO Rate Inputs

BENEFIT COST TEST FOR CONSERVATION PROGRAMS -- Cost-Effectiveness Analysis			
Company:		Kentucky Power Company	
General Inputs			
Input Data			Source
Electric Retail Rate (\$/kWh) =		\$0.08598 Residential	Kentucky Power Cost & Rate
		\$0.07402 Commercial	
		\$0.08001 All Classes	
Variable O&M (\$/kWh) =		\$0.00000	Escalation Rate = 3.00%
Environmental Damage Factor =		\$0.0097	Escalation Rate = 3.00%
Participant Discount Rate =		15.00%	KPCO Data Request from AEP Load Research
Utility Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
Social Discount Rate =		7.47%	KPCO Data Request from AEP Load Research
General Input Data Year =		2011	
Project Analysis Year 1 =		2011	
Residential and Small Commercial Energy Losses		0.7%	KPCO email dated 4/20/12 from Alan Graves
Residential and Small Commercial Peak Losses		10.7%	KPCO email dated 4/20/12 from Alan Graves

TABLE E2: BENCOST MODEL COMMODITY COST INPUTS¹⁷

Year	Avoided Energy Commodity Cost (\$/kWh)	Avoided Capacity Cost (\$/kW-year)	Avoided Electric Retail Rate (\$/kWh)
2011	\$0.0395	\$40.15	\$0.080
2012	\$0.0403	\$6.01	\$0.080
2013	\$0.0399	\$10.12	\$0.082
2014	\$0.0432	\$45.99	\$0.084
2015	\$0.0447	\$124.83	\$0.086
2016	\$0.0510	\$124.83	\$0.088
2017	\$0.0520	\$69.30	\$0.090
2018	\$0.0528	\$80.15	\$0.092
2019	\$0.0540	\$89.71	\$0.094
2020	\$0.0547	\$97.91	\$0.096
2021	\$0.0561	\$104.70	\$0.098
2022	\$0.0658	\$110.03	\$0.100
2023	\$0.0670	\$113.83	\$0.103
2024	\$0.0691	\$116.04	\$0.105
2025	\$0.0707	\$118.13	\$0.108
2026	\$0.0716	\$120.25	\$0.110
2027	\$0.0731	\$122.42	\$0.113
2028	\$0.0746	\$124.62	\$0.115
2029	\$0.0761	\$126.86	\$0.118
2030	\$0.0779	\$129.15	\$0.120
2031	\$0.0788	\$130.70	\$0.123
2032	\$0.0788	\$132.26	\$0.126
2033	\$0.0788	\$133.85	\$0.129
2034	\$0.0788	\$135.46	\$0.132
2035	\$0.0788	\$137.08	\$0.135

TABLE E3: BENCOST MODEL INPUTS

General Inputs	Specific Project Inputs
Retail Rate (\$/kWh)	Utility Project Costs (\$)
Non-Electric Fuel Retail Rate (\$/Fuel Unit)	Administrative Costs (\$)
Commodity Cost (\$/kWh)	Incentive Costs (\$)
Demand Cost (\$/kW/Yr)	Total Utility Project Costs (\$)
Peak Reduction Factor (%)	Direct Participant Project Costs (\$/Participant)
Variable O&M (\$/kWh)	Participant Non-Energy Costs (Annual \$/Part)
Non-Electric Fuel Cost (\$/Fuel Unit)	Participant Non-Energy Savings (Annual \$/Part)
Non-Electric Fuel Loss Factor	Project Life (Years)
Electric Environmental Damage Factor (\$/kWh)	Avg. kWh/Participant Saved
Participant Discount Rate (%)	Avg. Non-Electric Fuel Units/Part. Saved
Utility Discount Rate (%)	Avg. Additional Non-Electric Fuel Units/Part. Saved
Societal Discount Rate (%)	Number of Participants
General Input Data Year	Total Annual kWh Saved
Project Analysis Year	Incentive/Participant
Growth and Escalation Factors (%)	

¹⁷ Avoided cost inputs provided by Kentucky Power (AEP) Load Forecasting Group through a data request.

TABLE E4: BENCOST MODEL OUTPUTS

General Outputs	Benefit-Cost Test Outputs (Per Test)
Coincident Utility Peak Demand Reduction	Net Present Value of Benefits - Costs
Annual Utility Energy Reduction	Benefit-Cost Ratio
Total Utility Demand Reduction	Total Benefits
Total Utility Energy Reduction	Total Costs
Levelized Costs per kWh	
Levelized Costs per kW	
Annual Participant Savings	
Simple Payback	

KENTUCKY POWER COMPANY		Exhibit C				
DERIVATION OF 3 SECTOR SURCHARGES FOR 3 YR EXPERIMENT						PAGE 1 of 22
RESIDENTIAL SECTOR	TOTAL YEARS 1 thru 16	YEAR 17 (2012) 1st HALF	YEAR 17 (2012) 3rd QTR	YEAR 17 (2012) 4th QTR	TOTAL	
	(1)	(2)	(3)	(4)	(5)	
1	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$16,909,146	\$1,418,175	\$798,837	\$796,064	\$19,922,222
2	CUMULATIVE (OVER)/UNDER COLLECTION	0	20,161	508,711	864,987	-
3	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	(41,824)	0	0	0	(41,824)
4	TOTAL TO BE RECOVERED	16,867,322	1,438,336	1,307,548	1,661,051	19,880,398
5	TOTAL AMOUNT RECOVERED	16,846,815	929,625	0	0	17,776,440
6	EXPECTED FUTURE RECOVERIES	0	0	442,561	1,263,159	1,705,720
7	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(9,833)	0	0	0	(9,833)
8	TRANSFER PORTION OF BALANCE FROM COMMERCIAL	9,487	0	0	0	9,487
9	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$20,161	\$508,711	\$864,987	\$397,892	\$397,892
10	AMOUNT TO BE RECOVERED				\$1,661,051	
11	ADJ. ESTIMATED SECTOR KWH - YEAR 17			535,788,000	620,412,000	
SURCHARGE RANGE (\$ PER KWH)						
12	FLOOR (CARRYOVER)	COL. 4, L 2 / COL. 4, L 11			0.001394	
13	MIDPOINT - proposed rate			0.000826	0.002036	
14	CEILING (TOTAL COST)	COL. 4, L 4 / COL. 4, L 11			0.002677	
COMMERCIAL SECTOR	TOTAL YEARS 1 thru 16	YEAR 17 (2012) 1st HALF	YEAR 17 (2012) 3rd QTR	YEAR 17 (2012) 4th QTR	TOTAL	
	(1)	(2)	(3)	(4)	(5)	
15	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$3,267,224	\$405,550	\$503,148	\$959,276	\$5,135,198
16	CUMULATIVE (OVER)/UNDER COLLECTION	0	(100,405)	(466,391)	(161,230)	0
17	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	1,520	0	0	0	1,520
18	TOTAL TO BE RECOVERED	3,268,744	305,145	36,757	798,046	5,136,718
19	TOTAL AMOUNT RECOVERED	3,356,384	771,536	0	0	4,127,920
20	EXPECTED FUTURE RECOVERIES	0	0	197,987	318,523	516,510
21	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(3,278)	0	0	0	(3,278)
22	TRANSFER BALANCE TO RESIDENTIAL	(9,487)	0	0	0	(9,487)
22	(OVER)/UNDER COLLECTION TO BE REFUNDED	(\$100,405)	(\$466,391)	(\$161,230)	\$479,523	\$479,523
23	AMOUNT TO BE RECOVERED				\$798,046	
24	ADJ. ESTIMATED SECTOR KWH - YEAR 17			368,005,800	355,891,200	
SURCHARGE RANGE (\$ PER KWH)						
25	FLOOR (CARRYOVER)				(0.000453)	
26	MIDPOINT - proposed rate			0.000538	0.000895	
27	CEILING (TOTAL COST)				0.002242	
INDUSTRIAL SECTOR	TOTAL YEARS 1 thru 16	YEAR 17 (2012) 1st HALF	YEAR 17 (2012) 3rd QTR	YEAR 17 (2012) 4th QTR	TOTAL	
	(1)	(2)	(3)	(4)	(5)	
28	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$79,026	\$0	\$0	\$0	\$79,026
29	CUMULATIVE (OVER)/UNDER COLLECTION	0	0	0	0	0
30	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	0	0	0	0	0
31	TOTAL TO BE RECOVERED	79,026	0	0	0	79,026
32	TOTAL AMOUNT RECOVERED	92,137	0	0	0	92,137
33	EXPECTED FUTURE RECOVERIES	0	0	0	0	0
34	TRANSFER BALANCE TO RESIDENTIAL & COMMERCIAL	13,111	0	0	0	13,111
35	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$0	\$0	\$0	\$0	\$0
36	AMOUNT TO BE RECOVERED				\$0	
37	ADJ. ESTIMATED SECTOR KWH - YEAR 17			776,910,400	836,948,000	
SURCHARGE RANGE (\$ PER KWH)						
38	FLOOR (CARRYOVER)				0.000000	
39	MIDPOINT			0.000000	0.000000	
40	CEILING (TOTAL COST) - proposed rate				0.000000	

YEAR 1	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (4)	NET COST REV/YR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/YR (2)X(5) (6)	NET LOSS REVENUE (\$/KWH) (7)	TOTAL NET* LOSS REVENUES (6)X(7) (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (10) (4)X(5) (10)	TOTAL* INCENTIVE (11) (9)X(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)X(8)X(11) (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
RESIDENTIAL PROGRAMS												
Energy Fitness	552	148	\$221.65	\$122,351	2,690	398,120	\$0.03	\$12,397	\$43,177	\$43,177	\$43,177	\$177,925
Targeted Energy Efficiency - All Electric	223	101	\$1,026.88	\$228,994	5,570	562,570	\$0.03	\$17,513	\$0	\$11,450	\$11,450	\$257,957
- Non-All Electric	74	35	\$372.19	\$27,542	660	23,800	\$0.03	\$744	\$719	\$719	\$719	\$29,005
Compact Fluorescent Bulb	269	73	\$56.06	\$15,081	62	4,526	\$0.03	\$140	\$425	\$425	\$425	\$15,646
High - Efficiency Heat Pump - Resistance Heat	539	216	\$73.49	\$39,611	2,275	491,400	\$0.03	\$15,292	\$10,634	\$10,634	\$10,634	\$65,537
- Non Resistance Heat	527	206	\$61.31	\$32,310	613	167,478	\$0.03	\$5,215	\$8,756	\$8,756	\$8,756	\$46,321
High - Efficiency Heat Pump - Mobile Home	356	158	\$495.95	\$176,914	2,160	341,280	\$0.03	\$10,617	\$13,854	\$13,854	\$13,854	\$207,365
Mobile Home New Construction	70	22	\$292.69	\$20,488	0	0			\$1,024	\$1,024	\$1,024	\$21,512
TOTAL RESIDENTIAL PROGRAMS	2,610	959		\$663,291		1,989,174		\$61,918	\$77,565	\$77,565	\$77,565	\$815,255
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	91	19	\$1,256.51	\$114,524	0	0			\$0	\$5,726	\$5,726	\$120,250
- Class 2	5	1	\$1,875.40	\$9,377	0	0			\$0	\$469	\$469	\$9,846
Smart Financing - Existing Building	1	0	\$5,794.00	\$5,794	22,000	0	\$0.04	\$0	\$506	\$506	\$506	\$6,300
Smart Financing - New Building	0	0		\$0	30,600	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	97	20		\$129,695		0		\$0	\$506	\$5,195	\$5,701	\$136,395
INDUSTRIAL PROGRAMS - (West. Opt-Out Removed)												
Smart Audit - Class 1	15	1	\$149.40	\$2,241	0	0			\$0	\$112	\$112	\$2,353
Smart Audit - Class 2	2	1	\$9,980.00	\$17,950	0	0			\$0	\$698	\$698	\$18,658
Smart Financing - General	0	0		\$3,919	28,200	0	\$0.04	\$0	\$0	\$166	\$166	\$4,115
Smart Financing - Compressed Air System	0	0		\$0	164,800	0	\$0.03	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	17	2		\$24,120		0		\$0	\$0	\$1,206	\$1,206	\$23,326
TOTAL COMPANY	2,724	981		\$817,105		1,989,174		\$61,918	\$78,091	\$78,091	\$78,091	\$976,990
* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.												

Exhibit C
Page 2 of 22

YEAR 2 (1st HALF)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REVIS MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/MOS (2)X(5) (6)	NET LOST REVENUE (KWH) (7)	TOTAL NET * REVENUES LOST (8) (5)X(7) (9)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (10) (4)X(5) (11)	TOTAL * INCENTIVE (9)+(10) (12)	TOTAL EST. COSTS TO BE RECOVERED (4)+(9)+(11) (13)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 1997												
RESIDENTIAL PROGRAMS												
Energy Fitness	273	651	\$260.66	\$71,167	1,345	875,595	\$0.03	\$27,266	\$21,354	n/a	\$21,354	\$119,767
Targated Energy Efficiency - All Electric	118	279	\$818.97	\$96,636	2,785	777,015	\$0.03	\$24,188	\$0	\$4,832	\$4,832	\$125,658
- Non-All Electric	26	88	\$88.23	\$2,294	340	29,920	\$0.03	\$935	\$252	n/a	\$252	\$3,481
Compact Fluorescent Bulb	0	269		\$0	31	8,339	\$0.03	\$258	\$0	n/a	\$0	\$258
High - Efficiency Heat Pump - Resistance Heat	123	590	\$2.88	\$317	1,138	671,420	\$0.03	\$20,895	\$2,427	n/a	\$2,427	\$23,639
- Non-Resistance Heat	124	581	\$2.56	\$318	407	236,467	\$0.03	\$7,354	\$2,070	n/a	\$2,070	\$9,752
High - Efficiency Heat Pump - Mobile Home	109	403	\$157.87	\$17,208	1,080	455,240	\$0.03	\$13,540	\$4,235	n/a	\$4,235	\$24,984
Mobile Home New Construction	12	78	\$635.17	\$7,622	0	0	n/a	n/a	\$0	\$381	\$381	\$8,003
TOTAL RESIDENTIAL PROGRAMS	785	2,939		\$195,564		3,033,956		\$94,446	\$30,339	\$5,213	\$35,552	\$325,562
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	243	207	\$264.00	\$64,152	0	0	n/a	n/a	\$0	\$3,208	\$3,208	\$67,360
- Class 2	11	9	\$2,705.00	\$29,755	0	0	n/a	n/a	\$0	\$1,488	\$1,488	\$31,243
Smart Financing - Existing Building	0	1	n/a	\$5,629	11,000	11,000	\$0.04	\$469	\$0	\$281	\$281	\$6,379
Smart Financing - New Building	1	0	\$4,692.00	\$4,692	15,300	0	\$0.04	\$0	\$50	n/a	\$50	\$4,742
TOTAL COMMERCIAL PROGRAMS	255	217		\$104,228		11,000		\$469	\$50	\$4,977	\$5,027	\$109,724
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	9	20	\$279.56	\$2,516	0	0	n/a	n/a	\$0	\$125	\$125	\$2,642
Smart Audit - Class 2	1	2	\$1,133.00	\$1,133	0	0	n/a	n/a	\$0	\$57	\$57	\$1,190
Smart Financing - General	0	0	n/a	\$7,840	14,100	0	\$0.04	\$0	\$0	\$392	\$392	\$8,232
Smart Financing - Compressed Air System	0	0		\$0	82,400	0	\$0.03	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	10	22		\$11,489		0		\$0	\$0	\$575	\$575	\$12,064
TOTAL COMPANY	1,050	3,178		\$311,281		3,044,956		\$94,915	\$30,369	\$10,765	\$41,154	\$447,360

* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.

Exhibit C
PAGE 3A of 22

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
YEAR 2 (3rd QTR)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	PER PARTICIPANT PROGRAM COSTS (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/QTR (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES LOST (8)	EFFICIENCY INCENTIVE (EX. C PG. 19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	257	957	\$184.99	\$47,542	341	326,337	\$0.03	\$10,156	\$5,340	n/a	\$5,340	\$63,038
Targeted Energy Efficiency - All Electric	51	369	\$1,090.08	\$55,594	1,392	513,648	\$0.03	\$15,980	\$0	\$2,780	\$2,780	\$74,354
- Non-All Electric	15	108	\$193.33	\$2,900	170	18,960	\$0.03	\$574	\$25	n/a	\$25	\$3,499
Compact Fluorescent Bulb	0	269	n/a	\$0	16	4,304	\$0.03	\$133	\$0	\$0	\$0	\$133
High - Efficiency Heat Pump - Resistance Heat	109	717	\$55.05	\$6,000	547	392,199	\$0.03	\$12,213	\$787	n/a	\$787	\$19,000
- Non Resistance Heat	84	695	\$65.18	\$5,599	221	153,595	\$0.03	\$4,785	\$2,445	n/a	\$2,445	\$12,790
High - Efficiency Heat Pump - Mobile Home	77	509	\$689.62	\$53,101	625	318,125	\$0.03	\$9,894	\$2,503	n/a	\$2,503	\$65,498
Mobile Home New Construction	0	82	n/a	\$5,092	0	0			\$0	\$305	\$305	\$5,397
TOTAL RESIDENTIAL PROGRAMS	593	3,706		\$176,788		1,726,568		\$53,736	\$11,100	\$3,085	\$14,185	\$244,709
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	98	363	\$413.13	\$40,487	0	0			\$0	\$2,024	\$2,024	\$42,511
- Class 2	5	19	\$2,705.00	\$13,525	0	0			\$0	\$676	\$676	\$14,201
Smart Financing - Existing Building	2	2	\$3,067.00	\$6,134	11,100	22,200	\$0.04	\$940	\$1,627	n/a	\$1,627	\$6,701
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$327	\$0	\$0	\$0	\$327
TOTAL COMMERCIAL PROGRAMS	105	405		\$60,146		29,850		\$1,267	\$1,627	\$2,700	\$4,327	\$65,740
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	3	26	\$656.00	\$1,996	0	0			\$0	\$100	\$100	\$2,096
Smart Audit - Class 2	0	3	n/a	\$0	0	0			\$0	\$0	\$0	\$0
Smart Financing - General	0	0	n/a	\$4,785	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$4,785
Smart Financing - Compressed Air System	0	0	n/a	\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	3	29		\$6,783		0		\$0	\$0	\$100	\$100	\$6,883
TOTAL COMPANY	701	4,140		\$243,717		1,795,418		\$55,003	\$12,727	\$5,865	\$18,612	\$317,352
* Lost revenue and efficiency incentives are based on prospective values.												

Exhibit C
PAGE 38 of 22

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
YEAR 2 (4th QTR)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KW-HQTR (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	432	1,287	\$259.53	\$112,115	341	498,867	\$0.03	\$13,698	\$8,977	n/a	\$8,977	\$134,750
Targeted Energy Efficiency - All Electric	124	443	\$924.15	\$114,595	1,393	617,099	\$0.03	\$19,198	\$0	\$5,730	\$5,730	\$199,523
- Non-All Electric	78	146	\$103.55	\$8,077	170	24,820	\$0.03	\$775	\$129	n/a	\$129	\$8,981
Compact Fluorescent Bulb	0	269	n/a	\$0	17	4,573	\$0.03	\$141	\$0	\$0	\$0	\$141
High - Efficiency Heat Pump - Resistance Heat	111	823	\$106.90	\$11,866	547	450,181	\$0.03	\$14,019	\$801	n/a	\$801	\$26,686
- Non Resistance Heat	102	782	\$142.21	\$14,505	221	172,822	\$0.03	\$5,385	\$2,969	n/a	\$2,969	\$22,859
High - Efficiency Heat Pump - Mobile Home	50	565	\$406.70	\$20,335	625	353,125	\$0.03	\$10,982	\$1,625	n/a	\$1,625	\$32,942
Mobile Home New Construction	0	82	n/a	(\$749)	0	0	0	0	0	(\$37)	(\$37)	(\$785)
TOTAL RESIDENTIAL PROGRAMS	897	4,397		\$280,744		2,051,497		\$84,155	\$14,501	\$5,693	\$20,194	\$395,096
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	71	473	\$230.92	\$16,395	0	0	0	0	\$0	\$820	\$820	\$17,215
- Class 2	21	33	\$2,705.00	\$56,805	0	0	0	0	\$0	\$2,840	\$2,840	\$59,645
Smart Financing - Existing Building	9	8	\$2,282.56	\$20,943	11,100	88,800	\$0.04	\$3,761	\$7,320	n/a	\$7,320	\$31,624
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$327	\$0	n/a	\$0	\$327
TOTAL COMMERCIAL PROGRAMS	101	515		\$93,743		96,450		\$4,088	\$7,320	\$3,660	\$10,980	\$108,811
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	18	37	\$924.22	\$9,436	0	0	0	0	\$0	\$472	\$472	\$9,908
Smart Audit - Class 2	0	3	n/a	\$1,094	0	0	0	0	\$0	\$55	\$55	\$1,149
Smart Financing - General	0	0	n/a	\$11,802	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$11,802
Smart Financing - Compressed Air System	0	0	n/a	\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	18	40		\$22,332		0		\$0	\$0	\$527	\$527	\$22,859
TOTAL COMPANY	1,016	4,952		\$396,819		2,157,937		\$88,246	\$21,821	\$9,880	\$31,701	\$496,766

* Lost revenue and efficiency incentives are based on prospective values.

Exhibit C
PAGE 3C of 22

1988												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 3(1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	PER PARTICIPANT PROGRAM COSTS (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	TOTAL ACT. PROGRAM COSTS (5)	NET LOST REV/S MOS (KWH/PARTIC) (6)	TOTAL ENERGY SAVINGS KWH/S MOS (7)	NET LOST REVENUE (\$/KWH) (8)	TOTAL NET* REVENUES LOST (9)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (10)	MAXIMIZING INCENTIVE (5% of COSTS) (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	544	1,768	\$184.44	\$100,334	682	1,205,776	\$0.03	\$7,524	\$11,304	\$11,304	\$11,304	\$148,162
Targeted Energy Efficiency - All Electric	122	555	\$1,132.92	\$138,216	2,784	1,572,960	\$0.03	\$48,935	\$6,911	\$6,911	\$6,911	\$194,082
- Non-All Electric	24	203	\$112.92	\$2,710	340	69,020	\$0.03	\$2,156	\$40	\$40	\$40	\$4,906
Compact Fluorescent Bulb	0	269	\$0.00	\$0	32	6,608	\$0.03	\$266	\$0	\$0	\$0	\$266
High - Efficiency Heat Pump - Resistance Heat	21	887	\$70.10	\$1,472	1,084	970,378	\$0.03	\$30,218	\$152	\$152	\$152	\$31,842
- Non Resistance Heat	26	848	\$70.00	\$1,820	442	374,816	\$0.03	\$11,679	\$757	\$757	\$757	\$14,256
High - Efficiency Heat Pump - Mobile Home	66	616	\$535.30	\$35,330	1,250	770,000	\$0.03	\$23,947	\$2,145	\$2,145	\$2,145	\$61,422
Mobile Home New Construction	0	82	n/a	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	803	5,298		\$279,882		4,971,566		\$154,725	\$14,398	\$6,911	\$21,309	\$455,916
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	204	597	\$194.13	\$39,602	0	0	n/a	\$0	\$0	\$1,980	\$1,980	\$41,562
- Class 2	28	60	\$1,600.00	\$44,800	0	0	n/a	\$0	\$0	\$2,240	\$2,240	\$47,040
Smart Financing - Existing Building	8	16	\$5,581.50	\$44,652	22,200	355,200	\$0.04	\$15,043	\$6,505	\$6,505	\$6,505	\$66,201
Smart Financing - New Building	1	1	\$4,564.00	\$4,564	15,300	15,300	\$0.04	\$654	\$29	\$29	\$29	\$5,247
TOTAL COMMERCIAL PROGRAMS	241	674		\$133,618		370,500		\$15,697	\$6,535	\$4,220	\$10,755	\$160,070
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	12	51	\$246.08	\$2,953	0	0	n/a	\$0	\$0	\$148	\$148	\$3,101
Smart Audit - Class 2	1	3	\$1,800.00	\$1,800	0	0	n/a	\$0	\$0	\$90	\$90	\$1,890
Smart Financing - General	0	0	\$0.00	\$1,338	29,250	0	\$0.04	\$0	\$0	\$67	\$67	\$1,405
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	13	54		\$6,091	0	0		\$0	\$0	\$305	\$305	\$6,396
TOTAL COMPANY	1,057	5,966		\$419,591		5,342,056		\$170,422	\$20,933	\$11,436	\$32,369	\$622,382
* Los revenue and efficiency incentives are based on prospective values.												

Exhibit C
PAGE 4A of 122

1998													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 3 (2nd HALF)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/6 MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/6 MOS) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES LOST (6)X(7) (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (12)	
RESIDENTIAL PROGRAMS													
Energy Fitness	448	2,277	\$301.30	\$134,962	682	1,532,914	\$0.03	\$48,327	\$9,309	\$0	\$9,309	\$192,618	
Targeted Energy Efficiency - All Electric	131	697	\$1,187.91	\$155,954	2,784	1,940,448	\$0.03	\$60,367	\$0	\$7,778	\$7,778	\$23,709	
- Non-Air Electric	42	288	\$139.62	\$5,864	340	80,920	\$0.03	\$2,528	\$70	\$0	\$70	\$6,462	
Compact Fluorescent Bulb	0	269	\$0.00	\$0	32	6,608	\$0.03	\$266	\$0	\$0	\$0	\$266	
High - Efficiency Heat Pump - Resistance Heat	108	940	\$147.45	\$15,925	1,094	1,028,360	\$0.03	\$32,023	\$760	\$0	\$760	\$48,728	
- Non Resistance Heat	64	894	\$72.27	\$4,625	442	395,146	\$0.03	\$12,913	\$1,863	\$0	\$1,863	\$18,801	
High - Efficiency Heat Pump - Mobile Home	173	764	\$574.50	\$89,009	1,290	\$65,000	\$0.03	\$29,701	\$6,623	\$0	\$6,623	\$124,333	
Mobile Home New Construction	33	11	\$549.45	\$18,132	0	0	n/a	0	\$0	\$907	\$907	\$19,039	
TOTAL RESIDENTIAL PROGRAMS	999	6,090	\$424.101	\$424,101		\$661,398		\$185,925	\$17,645	\$8,665	\$26,330	\$635,956	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	178	795	\$634.65	\$95,203	0	0	n/a	0	\$0	\$4,760	\$4,760	\$99,963	
- Class 2	91	73	\$2,600.00	\$25,200	0	0	n/a	0	\$0	\$1,260	\$1,260	\$28,460	
Smart Financing - Existing Building	29	32	\$1,878.66	\$54,487	22,200	710,400	\$0.04	\$30,085	\$23,685	\$0	\$23,685	\$108,157	
Smart Financing - New Building	51	6	\$1,529.20	\$7,646	15,300	91,800	\$0.04	\$3,926	\$144	\$0	\$144	\$11,716	
TOTAL COMMERCIAL PROGRAMS	221	906	\$182,536	\$182,536		802,200		\$34,011	\$23,729	\$6,020	\$29,749	\$245,295	
INDUSTRIAL PROGRAMS - (West. Opt-Outs Removed)													
Smart Audit - Class 1	3	59	\$492.33	\$2,657	0	0	n/a	0	\$0	\$128	\$128	\$2,655	
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0	
Smart Financing - General	1	0	\$0.00	\$2,430	29,200	0	\$0.04	\$0	\$363	\$0	\$363	\$2,813	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	62,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	4	63	\$4,987	\$4,987		0		\$0	\$363	\$128	\$511	\$5,498	
TOTAL COMPANY	1,224	7,050	\$611,624	\$611,624		6,763,598		\$219,536	\$41,757	\$14,833	\$56,590	\$987,750	

* Lost revenue and efficiency incentives are based on prospective values.

Exhibit C
PAGE 4B of 22

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (1st HALF)	NEW PARTICIPANT NUMBER	CUMULATIVE PARTICIPANT NUMBER **	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT	TOTAL ACT. PROGRAM COSTS	NET LOST REV/HALF (KWH/PARTIC)	TOTAL ENERGY SAVINGS (KWH/HALF)	NET LOST REVENUE (SIKWH)	EFFICIENCY INCENTIVE (EX. C. PG.19C)	MAXIMIZING INCENTIVE (5% of COSTS)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
RESIDENTIAL PROGRAMS												
Energy Fitness	306	2,694	\$312.56	\$95,650	707	1,904,658	\$0.03	\$10,370	\$0	\$10,370	\$165,293	
Targeted Energy Efficiency - All Electric	75	773	\$1,907.41	\$143,056	630	486,990	\$0.03	\$0	\$7,153	\$7,153	\$165,359	
- Non-All Electric	12	249	\$112.00	\$1,344	306	76,194	\$0.03	\$0	\$0	\$0	\$3,784	
Compact Fluorescent Bulb	0	269	\$0.00	\$0	31	8,339	\$0.03	\$0	\$0	\$0	\$258	
High - Efficiency Heat Pump - Resistance Heat	99	1,002	\$273.74	\$27,100	1,200	1,202,400	\$0.03	\$4,375	\$0	\$4,375	\$68,918	
- Non Resistance Heat	2	853	\$50.00	\$100	442	377,026	\$0.03	\$0	\$5	\$5	\$11,853	
High - Efficiency Heat Pump - Mobile Home	101	826	\$545.99	\$55,145	1,475	1,218,950	\$0.03	\$8,505	\$0	\$8,505	\$101,541	
Mobile Home New Construction ***	98	45	\$587.20	\$57,546	1,756	79,020	\$0.03	\$4,353	\$0	\$4,353	\$64,357	
TOTAL RESIDENTIAL PROGRAMS	693	6,711		\$79,941		5,352,977		\$27,663	\$7,158	\$34,821	\$581,363	
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	186	964	\$204.71	\$38,076	0	n/a	n/a	\$0	\$1,904	\$1,904	\$39,980	
- Class 2	16	87	\$2,705.00	\$43,280	0	n/a	n/a	\$0	\$2,164	\$2,164	\$45,444	
Smart Financing - Existing Building	6	51	\$5,109.67	\$30,658	13,282	677,382	\$0.04	\$1,395	\$0	\$1,395	\$60,740	
Smart Financing - New Building	3	9	\$0.00	\$2,350	14,101	126,909	\$0.04	\$787	\$0	\$787	\$8,565	
TOTAL COMMERCIAL PROGRAMS	211	1,111		\$114,364		804,291		\$2,182	\$4,068	\$6,250	\$154,729	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	60	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	4	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	
Smart Financing - General	0	1	\$0.00	\$0	0	\$0.04	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	\$0.04	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	65		\$0				\$0	\$0	\$0	\$0	
TOTAL COMPANY	904	7,920		\$494,305		6,215,216		\$29,845	\$11,226	\$41,071	\$736,092	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/96.
 *** Participants since 09/01/98.

PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.19C) (9)	MAXIMIZING INCENTIVE (10)	TOTAL * INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
			PER PARTICIPANT (3)	(1)X(3)	(5)	(2)X(6)	(7)	(8)	(9)	(10)	(9)+(10)	(4)+(8)+(11)
1999												
KENTUCKY POWER COMPANY												
ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (2nd HALF)												
PROGRAM DESCRIPTIONS												
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,519	\$0.00	\$972	707	1,780,933	\$0.03	\$55,423	\$0	\$0	\$0	\$55,395
Targeted Energy Efficiency - All Electric	66	700	\$1,222.76	\$80,702	690	441,000	\$0.03	\$13,720	\$0	\$4,035	\$4,035	\$98,457
- Non-All Electric	8	220	\$67.50	\$540	306	67,320	\$0.03	\$2,103	\$40	\$0	\$40	\$2,583
Compact Fluorescent Bulb	0	123	\$0.00	\$0	31	3,813	\$0.03	\$118	\$0	\$0	\$0	\$118
High - Efficiency Heat Pump - Resistance Heat	140	810	\$211.14	\$29,560	1,200	972,000	\$0.03	\$30,268	\$6,187	\$0	\$6,187	\$66,015
- Non Resistance Heat	0	593	\$0.00	\$0	447	265,071	\$0.03	\$8,260	\$0	\$0	\$0	\$8,260
High - Efficiency Heat Pump - Mobile Home	134	739	\$539.07	\$72,236	1,475	1,090,025	\$0.03	\$33,900	\$11,284	\$0	\$11,284	\$117,420
Mobile Home New Construction ***	123	196	\$581.42	\$71,515	1,755	343,950	\$0.03	\$10,698	\$5,464	\$0	\$5,464	\$87,677
TOTAL RESIDENTIAL PROGRAMS	471	5,900		\$255,525		4,964,142		\$154,490	\$22,975	\$4,035	\$27,010	\$437,025
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	188	1,129	\$355.11	\$65,948	0	0	n/a		\$0	\$3,347	\$3,347	\$70,295
- Class 2	21	103	\$2,705.00	\$56,805	0	0	n/a		\$0	\$2,840	\$2,840	\$59,645
Smart Financing - Existing Building	25	66	\$2,725.04	\$68,151	13,282	876,612	\$0.04	\$37,125	\$5,814	\$0	\$5,814	\$111,090
Smart Financing - New Building	8	13	\$3,087.00	\$24,696	14,101	183,313	\$0.04	\$7,840	\$2,059	\$0	\$2,059	\$34,635
TOTAL COMMERCIAL PROGRAMS	242	1,311		\$216,600		1,059,925		\$44,965	\$7,913	\$6,187	\$14,100	\$275,665
INDUSTRIAL PROGRAMS -												
(w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	57	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	62		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	713	7,273		\$472,125		6,024,067		\$199,455	\$30,888	\$10,222	\$41,110	\$712,690
* Lost revenue and efficiency incentives are based on prospective values.												
** Cumulative participants include a reduction for the cumulative participants as of 12/31/96.												
*** Participants since 09/01/98.												

Exhibit C
PAGE 5B of 22

Year 2000													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 5 (1st half)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/HALF (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES LOST (8)	EFFICIENCY INCENTIVE (EX C, PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)+(10)+(11) (12)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	2,161	\$0.00	\$0	707	1,527,827	\$0.03	\$47,546	\$0	\$0	\$0	\$47,546	
Targeted Energy Efficiency - All Electric	66	659	\$1,272.61	\$63,992	630	415,170	\$0.03	\$12,916	\$0	\$4,200	\$4,200	\$101,108	
- Non-All Electric	28	202	\$50.82	\$2,543	306	61,872	\$0.03	\$1,931	\$141	\$0	\$141	\$4,615	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump - Resistance Heat	38	683	\$200.00	\$7,600	1,200	619,600	\$0.03	\$25,522	\$1,679	\$0	\$1,679	\$34,601	
- Non Resistance Heat	0	348	\$0.00	\$0	447	155,556	\$0.03	\$4,847	\$0	\$0	\$0	\$4,847	
High - Efficiency Heat Pump - Mobile Home	45	683	\$500.00	\$22,500	1,475	1,007,425	\$0.03	\$31,331	\$3,789	\$0	\$3,789	\$57,620	
Mobile Home New Construction ***	101	302	\$530.20	\$53,550	1,755	530,010	\$0.03	\$16,483	\$4,486	\$0	\$4,486	\$74,519	
TOTAL RESIDENTIAL PROGRAMS	278	5,038		\$170,185		4,517,400		\$140,576	\$10,095	\$4,200	\$14,295	\$325,056	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	144	1,125	\$397.19	\$57,195	0	0	na	0	\$0	\$0	\$0	\$0	
- Class 2	8	112	\$2,705.00	\$21,640	0	0	na	0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	16	86	\$1,307.91	\$20,917	13,282	1,142,252	\$0.04	\$46,374	\$3,721	\$0	\$3,721	\$73,072	
Smart Financing - New Building	4	20	\$5,298.75	\$25,195	14,101	282,020	\$0.04	\$12,062	\$1,049	\$0	\$1,049	\$38,306	
TOTAL COMMERCIAL PROGRAMS	172	1,344		\$124,947		1,424,272		\$60,436	\$4,770	\$3,942	\$8,712	\$194,095	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	na	0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	na	0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	450	6,382		\$295,132		5,941,672		\$201,012	\$14,865	\$8,142	\$23,007	\$519,199	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/97.
 *** Participants since 09/01/98

Exhibit C
PAGE 6A of 22

Year 2000												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 5 (2nd half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (2)X(5)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (6)X(7)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(5)	TOTAL * INCENTIVE (9)X(10)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)X(8)X(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	1,525	\$0.00	\$0	706	1,076,650	\$0.03	\$33,505	\$0	\$0	\$0	\$33,505
Targeted Energy Efficiency - All Electric	99	583	\$1,115.41	\$110,426	630	367,290	\$0.03	\$11,426	\$0	\$5,521	\$5,521	\$127,373
- Non-All Electric	21	170	\$94.67	\$1,988	306	52,020	\$0.03	\$1,625	\$105	\$0	\$105	\$3,718
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	25	481	\$200.00	\$5,000	1,200	577,200	\$0.03	\$17,974	\$1,105	\$0	\$1,105	\$24,079
- Non Resistance Heat	0	147	\$0.00	\$0	446	65,662	\$0.03	\$2,043	\$0	\$0	\$0	\$2,043
High - Efficiency Heat Pump - Mobile Home	43	572	\$495.35	\$21,300	1,476	844,272	\$0.03	\$26,257	\$3,621	\$0	\$3,621	\$51,178
Mobile Home New Construction ***	94	403	\$975.00	\$54,050	1,755	707,265	\$0.03	\$21,996	\$4,175	\$0	\$4,175	\$60,221
TOTAL RESIDENTIAL PROGRAMS	282	3,881		\$192,764		3,690,299		\$114,826	\$9,006	\$5,521	\$14,527	\$322,117
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	199	1,026	\$165.24	\$26,273	0	0	n/a	0	\$0	\$1,314	\$1,314	\$27,587
- Class 2	29	98	\$2,705.00	\$76,445	0	0	n/a	0	\$0	\$3,922	\$3,922	\$62,367
Smart Financing - Existing Building	24	97	\$914.54	\$21,949	13,282	1,288,354	\$0.04	\$64,562	\$5,581	\$0	\$5,581	\$62,092
Smart Financing - New Building	0	21	\$0.00	\$7,269	14,102	296,142	\$0.04	\$12,666	\$0	\$0	\$0	\$19,935
TOTAL COMMERCIAL PROGRAMS	212	1,242		\$133,936		1,584,496		\$67,228	\$5,581	\$5,236	\$10,817	\$211,961
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	0	\$0	0	\$0
TOTAL COMPANY	494	5,123		\$326,700		5,274,755		\$182,054	\$14,587	\$10,757	\$25,344	\$554,093

* Lost revenue and efficiency incentives are based on prospective values.

** Cumulative participants include a reduction for the cumulative participants as of 12/31/97.

*** Participants since 09/01/98.

Year 2001													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 6 (1st Half)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/OTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/HALF (2)(X)(6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET* LOST REVENUES (6)(X)(7)	EFFICIENCY INCENTIVE (EX-C PG.19C) (8)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X)(5%)	TOTAL* INCENTIVE (11) (9)(+)(10)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)(+)(8)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	1,044	\$0.00	\$0	707	738,108	\$0.03112	\$22,970	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency - All Electric	62	535	\$1,276.94	\$79,170	630	337,650	\$0.03111	\$10,498	\$0	\$3,959	\$3,959	\$93,615	\$93,615
Targeted Energy Efficiency - Non-All Electric	18	137	\$97.89	\$1,582	308	41,922	\$0.03724	\$1,310	\$90	\$0	\$90	\$2,982	\$2,982
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	23	430	\$201.04	\$4,624	1200	\$25,600	\$0.03114	\$16,367	\$1,016	\$0	\$1,016	\$22,007	\$22,007
High - Efficiency Heat Pump - Non Resistance Heat	0	81	\$0.00	\$0	447	36,207	\$0.03116	\$1,228	\$0	\$0	\$0	\$1,128	\$1,128
High - Efficiency Heat Pump - Mobile Home	53	556	\$472.15	\$25,024	1475	823,050	\$0.03110	\$25,597	\$4,463	\$0	\$4,463	\$55,084	\$55,084
Mobile Home New Construction ***	83	488	\$537.04	\$44,574	1755	855,440	\$0.03110	\$26,635	\$3,687	\$0	\$3,687	\$74,895	\$74,895
TOTAL RESIDENTIAL PROGRAMS	239	3,261		\$154,974		3,350,377		\$104,463	\$9,256	\$3,959	\$12,215	\$272,692	\$272,692
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	134	1,017	\$321.82	\$43,124	0	0	n/a	\$0	\$0	\$2,156	\$2,156	\$45,280	\$45,280
Smart Audit - Class 2	28	105	\$1,610.00	\$42,280	0	0	n/a	\$0	\$0	\$2,114	\$2,114	\$44,394	\$44,394
Smart Financing - Existing Building	15	112	\$2,306.00	\$34,535	13,282	1,487,884	\$0.04235	\$62,890	\$3,488	\$0	\$3,488	\$101,122	\$101,122
Smart Financing - New Building	8	25	\$4,016.13	\$32,129	14,101	352,825	\$0.04277	\$15,077	\$2,099	\$0	\$2,099	\$46,305	\$46,305
TOTAL COMMERCIAL PROGRAMS	165	1,259		\$152,188		1,840,109		\$78,076	\$5,687	\$4,270	\$9,957	\$240,101	\$240,101
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	424	4,540		\$307,142		5,190,486		\$182,569	\$14,843	\$8,229	\$23,072	\$512,783	\$512,783

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 09/30/09.
 *** Participants since 01/01/98.

Year 2001	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (SIKWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG. 19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 6 (and Half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (SIKWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG. 19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	535	\$0.00	\$0	706	377.710	\$0.03112	\$11,754	\$0	\$0	\$0	\$11,754
Targeted Energy Efficiency - All Electric	89	485	\$1,016.85	\$695,650	630	306,160	\$0.03111	\$9,529	\$0	\$4,483	\$4,483	\$103,669
Targeted Energy Efficiency - Non-All Electric	46	122	\$81.45	\$3,747	306	37,332	\$0.03124	\$1,168	\$231	\$0	\$231	\$5,144
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	30	412	\$173.33	\$5,200	1,200	494,400	\$0.03114	\$15,396	\$1,326	\$0	\$1,326	\$21,922
High - Efficiency Heat Pump - Non Resistance Heat	0	35	\$0.00	\$0	446	15,610	\$0.03116	\$4,465	\$0	\$0	\$0	\$485
High - Efficiency Heat Pump - Mobile Home	47	469	\$510.54	\$24,000	1,476	692,244	\$0.03110	\$21,529	\$3,958	\$0	\$3,958	\$49,487
Mobile Home New Construction ***	92	569	\$555.43	\$51,100	1,755	986,840	\$0.03110	\$31,002	\$4,087	\$0	\$4,087	\$66,189
TOTAL RESIDENTIAL PROGRAMS	303	2,527		\$173,707		2,920,316		\$90,058	\$9,602	\$4,483	\$14,085	\$276,650
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	131	986	\$464.04	\$59,479	0	0	n/a	\$0	\$0	\$2,974	\$2,974	\$62,453
Smart Audit - Class 2	51	111	\$9,817.20	\$49,088	0	0	n/a	\$0	\$0	\$2,454	\$2,454	\$51,540
Smart Financing - Existing Building	151	109	\$1,654.27	\$24,964	13,282	1,447,738	\$0.04235	\$81,312	\$3,488	\$0	\$3,488	\$89,784
Smart Financing - New Building	18	34	\$1,799.28	\$32,387	14,102	479,468	\$0.04277	\$20,307	\$4,722	\$0	\$4,722	\$57,816
TOTAL COMMERCIAL PROGRAMS	169	1,220		\$165,916		1,927,206		\$81,619	\$8,210	\$5,428	\$13,638	\$281,373
INDUSTRIAL PROGRAMS - (West-Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	472	3,847		\$338,623		4,847,522		\$172,677	\$17,812	\$9,911	\$27,723	\$540,023

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/08
 *** Participants since 07/01/09.

Exhibit C
PAGE 78 of 122

Year 2002												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 7 (1st Half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX C. PG.19C) (9)	MAXIMIZING INCENTIVE (% OF COSTS) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	116	\$0.00	\$0	707	82,012	\$0.03112	\$2,552	\$0	\$0	\$0	\$2,552
Targeted Energy Efficiency - All Electric	63	442	\$1,732.40	\$110,401	1,028	454,376	\$0.03111	\$14,136	\$0	\$5,520	\$5,520	\$130,057
Targeted Energy Efficiency - Non-All Electric	32	135	\$65.47	\$2,095	315	42,525	\$0.03124	\$1,328	\$137	\$0	\$137	\$9,560
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	1	314	\$1,152.00	\$1,152	1,200	375,800	\$0.03114	\$11,734	\$44	\$0	\$44	\$12,930
High - Efficiency Heat Pump - Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03118	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Mobile Home	43	414	\$919.77	\$26,650	1,144	473,616	\$0.03110	\$14,729	\$1,244	\$0	\$1,244	\$42,623
Mobile Home New Construction ***	57	568	\$641.77	\$36,581	1,809	1,027,512	\$0.03110	\$31,956	\$231	\$0	\$231	\$68,766
TOTAL RESIDENTIAL PROGRAMS	196	1,989		\$176,879	2,456,841			\$76,435	\$1,656	\$5,520	\$7,176	\$260,490
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	125	923	\$432.92	\$54,115	0	0	n/a	\$0	\$0	\$2,706	\$2,706	\$56,821
Smart Audit - Class 2	8	104	\$3,711.00	\$29,688	0	0	n/a	\$0	\$0	\$1,484	\$1,484	\$31,172
Smart Financing - Existing Building	7	101	\$2,592.71	\$17,809	13,282	1,341,482	\$0.04235	\$56,612	\$1,628	\$0	\$1,628	\$76,309
Smart Financing - New Building	5	42	\$1,394.50	\$6,973	14,101	592,242	\$0.04277	\$25,330	\$1,312	\$0	\$1,312	\$39,515
TOTAL COMMERCIAL PROGRAMS	145	1,170		\$108,645	1,933,724			\$82,142	\$2,940	\$4,190	\$7,130	\$197,917
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	341	3,159		\$285,524	4,390,565			\$158,577	\$4,395	\$9,710	\$14,306	\$458,407
* Lost revenue and efficiency incentives are based on prospective values. ** Cumulative participants include a reduction for the cumulative participants as of 06/30/1999. *** Participants since 01/01/1999.												

Exhibit C
 PAGE 8A of 22

Year 2002												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 7 (2nd Half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/DTR (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (2)(X)5 (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)(X)7 (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (4)(X)5% (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (4)+(8)+(11) (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Larged Energy Efficiency - All Electric	76	457	\$1,039.33	\$78,969	1,028	469,796	\$0.03111	\$14,615	\$3,949	\$3,949	\$3,949	\$97,553
- Non-All Electric	13	156	\$65.92	\$1,117	315	46,140	\$0.03124	\$1,555	\$56	\$56	\$56	\$2,706
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	0	177	\$0.00	(\$352)	1,200	212,400	\$0.03114	\$6,614	\$0	\$0	\$0	\$6,262
High - Efficiency Heat Pump - Mobile Home	0	446	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction ***	43	309	\$603.64	\$25,965	1,144	352,352	\$0.03110	\$10,958	\$1,244	\$1,244	\$1,244	\$38,167
TOTAL RESIDENTIAL PROGRAMS	61	519	\$644.46	\$39,312	1,809	936,671	\$0.03110	\$29,199	\$248	\$248	\$248	\$68,759
COMMERCIAL PROGRAMS	193	1,617	\$145.031	\$27,959	2,022	2,022,559	\$0.03110	\$62,921	\$1,548	\$1,548	\$1,548	\$213,446
Smart Audit - Class 1	0	766	\$0.00	\$74,422	0	0	n/a	\$0	\$0	\$3,721	\$3,721	\$78,143
- Class 2	0	90	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	25	97	\$909.76	\$22,744	13,282	1,288,354	\$0.04235	\$54,562	\$5,614	\$5,614	\$5,614	\$93,120
Smart Financing - New Building	16	44	\$2,424.94	\$38,799	14,102	620,488	\$0.04277	\$26,538	\$4,197	\$4,197	\$4,197	\$69,534
TOTAL COMMERCIAL PROGRAMS	41	1,017	\$135.965	\$135,965	1,908	1,908,842	\$0.03110	\$81,100	\$10,011	\$10,011	\$10,011	\$230,797
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	234	2,634	\$280.996	\$280,996	3,931	3,931,401	\$0.03110	\$144,021	\$11,559	\$11,559	\$11,559	\$444,246

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/1999.
 *** Participants since 07/01/1999.

Exhibit C
 PAGE 88 of 22

Year 2003													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 8 (1st HALF)													9A of
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.19C) (9)	MAXIMIZING INCENTIVE (4)X(.95) (10)	TOTAL * INCENTIVE (9)+ (10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Energy Fitness													
Targeted Energy Efficiency													
- All Electric	100	467	\$840.84	\$84,984	1,028	480,078	\$0.03111	\$14,935	\$0	\$4,249	\$4,249	\$104,768	
- Non-All Electric	7	151	\$79.29	\$555	314	47,414	\$0.03124	\$1,491	\$0	\$0	\$0	\$2,066	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Resistance Heat	0	94	\$0.00	\$0	1,200	112,800	\$0.03114	\$3,613	\$0	\$0	\$0	\$3,613	
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	34	266	\$379.41	\$12,900	1,144	306,892	\$0.03110	\$9,535	\$983	\$0	\$983	\$23,418	
Mobile Home New Construction ***													
- Heat Pump	46	460	\$482.61	\$22,200	1,809	831,880	\$0.03110	\$25,885	\$187	\$0	\$187	\$48,292	
- Air Conditioner	0	0	\$0.00	\$0	157	0	\$0.03124	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	101	23	\$142.72	\$14,415	1,194	27,462	\$0.03116	\$656	\$2,127	\$0	\$2,127	\$17,398	
TOTAL RESIDENTIAL PROGRAMS	288	1,463	\$195.054	\$195,054		1,806,024		\$58,185	\$3,327	\$4,249	\$7,576	\$198,815	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	620	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	73	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	110	\$0.00	\$0	13,282	1,461,020	\$0.04235	\$81,874	\$0	\$0	\$0	\$81,874	
Smart Financing - New Building	0	49	\$0.00	\$0	14,701	690,949	\$0.04277	\$29,552	\$0	\$0	\$0	\$29,552	
TOTAL COMMERCIAL PROGRAMS	0	852	\$0	\$0		2,151,969		\$91,426	\$0	\$0	\$0	\$91,426	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0				\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	288	2,315	\$195.054	\$195,054		3,957,993		\$147,611	\$3,327	\$4,249	\$7,576	\$290,241	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2000.
 *** Participants since 01/01/2000.

Year 2003													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 0 (2nd HALF)													9B of
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF) (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.19C) (9)	MAXIMIZING INCENTIVE (6% of COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
			PER PARTICIPANT (1X)(3)			(2X)(6)		(6X)(7)		(4X)(5%)	(9)*(10)	(4)*(9)*(11)	
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Energy Fitness													
Targeted Energy Efficiency	69	473	\$674.94	\$67,271	1,028	466,244	\$0.03111	\$15,127	\$0	\$3,364	\$3,364	\$85,762	
- All Electric	69	167	\$76.10	\$5,251	316	32,772	\$0.03124	\$1,649	\$285	\$0	\$295	\$7,195	
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	75,600	\$0.03114	\$2,354	\$0	\$0	\$0	\$2,354	
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	29	256	\$453.45	\$13,150	1,144	282,864	\$0.03110	\$9,108	\$839	\$0	\$839	\$23,097	
- Mobile Home													
Mobile Home New Construction **	64	419	\$649.59	\$41,574	1,810	796,390	\$0.03110	\$23,586	\$260	\$0	\$260	\$65,420	
- Heat Pump	1	0	\$150.00	\$150	158	0	\$0.03124	\$0	\$0	\$0	\$0	\$150	
- Air Conditioner													
Modified Energy Fitness	441	324	\$431.43	\$190,282	1,194	386,856	\$0.03116	\$12,054	\$9,287	\$0	\$9,287	\$211,603	
TOTAL RESIDENTIAL PROGRAMS	673	1,702		\$317,658		2,052,726		\$63,878	\$10,681	\$3,364	\$14,045	\$395,591	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	463	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	65	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	77	\$0.00	\$0	13,282	1,022,714	\$0.04235	\$43,312	\$0	\$0	\$0	\$43,312	
Smart Financing - New Building	0	47	\$0.00	\$0	14,102	662,794	\$0.04277	\$28,348	\$0	\$0	\$0	\$28,348	
TOTAL COMMERCIAL PROGRAMS	0	640		\$0		1,685,508		\$71,660	\$0	\$0	\$0	\$71,660	
INDUSTRIAL PROGRAMS - (w/Esl. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	673	2,342		\$317,658		3,738,234		\$135,538	\$10,681	\$3,364	\$14,045	\$467,241	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2000.
 *** Participants since 07/01/2000.

Year 2004													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 10A of 122
YEAR 9 (1st HALF)	NEW PARTICIPANT NUMBER	CUMULATIVE PARTICIPANT NUMBER	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOSS REV/QTR	TOTAL ENERGY SAVINGS KWH/HALF	NET LOSS REVENUE (\$/KWH)	TOTAL NET REVENUES (6)(9)	EFFICIENCY INCENTIVE (EX. C. PG.18C)	MAXIMIZING INCENTIVE (5% of COSTS)	TOTAL INCENTIVE	TOTAL ACTUAL COSTS TO BE RECOVERED	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
PROGRAM DESCRIPTIONS			PER PARTICIPANT COSTS	TOTAL PROGRAM COSTS	(KWH/PARTIC)	KWH/HALF	(\$/KWH)	(\$)	(\$)	(\$)	(\$)	(\$)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	72	463	\$751.54	\$54,111	1,028	475,984	\$0.03111	\$14,807	\$0	\$2,706	\$2,706	\$71,824	
- Non-All Electric	10	179	\$78.60	\$786	314	56,206	\$0.03124	\$1,756	\$43	\$0	\$43	\$2,585	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	42	\$0.00	\$0	1,200	50,400	\$0.03114	\$1,569	\$0	\$0	\$0	\$1,569	
- Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat													
High - Efficiency Heat Pump													
- Mobile Home	41	247	\$428.05	\$17,550	1,144	282,868	\$0.03110	\$8,788	\$1,188	\$0	\$1,188	\$27,824	
Mobile Home New Construction ***													
- Heat Pump	68	394	\$503.68	\$34,250	1,808	712,352	\$0.03110	\$22,154	\$276	\$0	\$276	\$56,880	
- Air Conditioner	1	1	\$150.00	\$150	157	157	\$0.03124	\$5	\$0	\$0	\$0	\$155	
Modified Energy Fitness	334	735	\$417.76	\$139,531	1,194	877,880	\$0.03116	\$27,346	\$7,034	\$0	\$7,034	\$173,911	
TOTAL RESIDENTIAL PROGRAMS	526	2,051		\$246,378		2,455,237		\$76,425	\$8,559	\$2,706	\$11,245	\$534,048	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	338	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	30	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	54	\$0.00	\$0	13,282	717,226	\$0.04235	\$30,375	\$0	\$0	\$0	\$30,375	
- New Building	0	43	\$0.00	\$0	14,101	606,343	\$0.04277	\$25,933	\$0	\$0	\$0	\$25,933	
TOTAL COMMERCIAL PROGRAMS	0	465		\$0		1,323,571		\$56,308	\$0	\$0	\$0	\$56,308	
INDUSTRIAL PROGRAMS - (West Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	526	2,526		\$246,378		3,778,808		\$132,733	\$8,559	\$2,706	\$11,245	\$590,356	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2001.
 *** Participants since 01/01/2001.

Year 2004													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 108 of 22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS (1)X(3)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (2)X(5)	NET LOST REVENUE (SKWH) (7)	TOTAL NET * REVENUES (8)X(7)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (4)+(9)+(11)	
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Energy Fitness													
Targeted Energy Efficiency													
- All Electric	89	462	\$1,116.43	\$99,540	1,028	474,936	\$0.03111	\$14,775	\$0	\$4,977	\$4,977	\$119,292	
- Non-All Electric	72	205	\$60.60	\$4,363	316	64,760	\$0.03124	\$2,024	\$308	\$0	\$308	\$6,695	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	15	\$0.00	\$0	1,200	18,000	\$0.03114	\$561	\$0	\$0	\$0	\$561	
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat													
High - Efficiency Heat Pump	46	239	\$469.57	\$21,600	1,144	273,416	\$0.03110	\$8,503	\$1,330	\$0	\$1,330	\$31,433	
- Mobile Home													
Mobile Home New Construction ***													
- Heat Pump	70	379	\$597.14	\$41,800	1,610	665,990	\$0.03110	\$21,334	\$284	\$0	\$284	\$63,418	
- Air Conditioner	0	2	#DIV/0!	\$0	158	316	\$0.03124	\$10	\$0	\$0	\$0	\$10	
Modified Energy Fitness	391	1,070	\$347.20	\$135,756	1,194	1,277,560	\$0.03116	\$39,809	\$8,234	\$0	\$8,234	\$163,799	
TOTAL RESIDENTIAL PROGRAMS	668	2,372	\$303,059	\$303,059	2,795,018			\$87,016	\$10,156	\$4,977	\$15,133	\$405,208	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	191	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	10	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	41	\$0.00	\$0	13,262	544,562	\$0.04235	\$23,062	\$0	\$0	\$0	\$23,062	
- New Building	0	30	\$0.00	\$0	14,102	423,060	\$0.04277	\$18,094	\$0	\$0	\$0	\$18,094	
TOTAL COMMERCIAL PROGRAMS	0	272	\$0	\$0	667,822			\$41,156	\$0	\$0	\$0	\$41,156	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	668	2,644	\$303,059	\$303,059	2,795,018			\$128,172	\$10,156	\$4,977	\$15,133	\$446,364	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2001.
 *** Participants since 07/07/2001.

Year 2003		NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/QTR	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET *	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL * COSTS TO BE
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT (3)	PER PARTICIPANT (4)	(KWH/ PARTICIPANT) (5)	KWH/ HALF (6)	(\$/KWH) (7)	REVENUES (8)	(EX. C. PG.19C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	RECOVERED (12)
RESIDENTIAL PROGRAMS	0	0	\$0.00	(1)(X)(3)	707	(2)(X)(5)	\$0.03112	(6)(X)(7)	\$0	\$0	(9)+(10)	(4)+(8)+(11)
Energy Fitness	0	0	\$0.00	\$0	707	(2)(X)(5)	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	88	477	\$1,109.22	\$97,611	896	427,992	\$0.03111	\$13,296	\$0	\$4,881	\$4,881	\$115,788
- All Electric	57	218	\$62.47	\$3,551	267	56,206	\$0.03124	\$1,818	\$1,125	\$0	\$1,125	\$6,504
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	34	231	\$560.21	\$19,047	1,145	264,495	\$0.03110	\$8,226	\$2,653	\$0	\$2,653	\$29,966
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction ***	67	371	\$614.85	\$41,195	1,808	670,768	\$0.03110	\$20,861	\$8,372	\$0	\$8,372	\$70,428
- Heat Pump	0	2	\$0.00	\$0	157	314	\$0.03124	\$10	\$0	\$0	\$0	\$10
- Air Conditioner	371	1,479	\$400.87	\$148,723	613	906,627	\$0.03116	\$28,250	\$15,612	\$0	\$15,612	\$192,585
Modified Energy Fitness	617	2,778	\$510.137	\$310,137	2,327,602	638,996	\$0.03110	\$72,461	\$27,802	\$4,881	\$32,683	\$415,281
TOTAL RESIDENTIAL PROGRAMS												
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	64	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	3	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	29	\$0.00	\$0	13,282	385,178	\$0.04295	\$10,312	\$0	\$0	\$0	\$16,512
Smart Financing - New Building	0	18	\$0.00	\$0	14,101	253,818	\$0.04277	\$10,856	\$0	\$0	\$0	\$10,856
TOTAL COMMERCIAL PROGRAMS												
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS												
TOTAL COMPANY	617	2,892	\$310,137	\$310,137	2,966,768	638,996	\$0.03110	\$99,629	\$27,802	\$4,881	\$32,683	\$442,449

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2002.
 *** Participants since 01/01/2002.

Year 2005													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 10 (2nd HALF)													11B of
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	REV/CTRS (KWH/ PARTICIPANT) (5)	NET LOST ENERGY SAVINGS (KWH/ HALF (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (B) (S)(X7) (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X) 5%	TOTAL * INCENTIVE (11) (9)(X10)	RECOVERED COSTS TO BE (12) (4)(X)(9)(11)	TOTAL ACTUAL COSTS TO BE
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	705	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	\$0
Energy Fitness													
Targeted Energy Efficiency													
- All Electric	85	482	\$1,207.52	\$102,639	656	440,832	\$0.03111	\$13,714	\$0	\$5,132	\$5,132	\$121,485	\$121,485
- Non-All Electric	26	233	\$65.95	\$1,712	268	61,978	\$0.03124	\$1,556	\$973	\$0	\$973	\$4,161	\$4,161
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat													
High - Efficiency Heat Pump													
- Mobile Home	40	225	\$476.78	\$19,071	1,144	257,400	\$0.03110	\$9,005	\$3,168	\$0	\$3,168	\$30,244	\$30,244
Mobile Home New Construction ***													
- Heat Pump	83	385	\$544.23	\$45,171	1,810	696,850	\$0.03110	\$21,672	\$10,372	\$0	\$10,372	\$77,215	\$77,215
- Air Conditioner	0	2	\$0.00	\$0	158	316	\$0.03124	\$10	\$0	\$0	\$0	\$10	\$10
Modified Energy Fitness	351	1,826	\$373.12	\$130,965	612	1,117,512	\$0.03116	\$34,822	\$14,770	\$0	\$14,770	\$180,357	\$180,357
TOTAL RESIDENTIAL PROGRAMS	565	3,163	\$299,556	\$299,556		2,574,688		\$80,159	\$28,823	\$5,132	\$33,955	\$413,672	\$413,672
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	20	\$0.00	\$0	13,282	265,640	\$0.04235	\$11,250	\$0	\$0	\$0	\$11,250	\$11,250
Smart Financing - New Building	0	11	\$0.00	\$0	14,102	155,122	\$0.04277	\$6,635	\$0	\$0	\$0	\$6,635	\$6,635
TOTAL COMMERCIAL PROGRAMS	0	31	\$0	\$0		420,762		\$17,885	\$0	\$0	\$0	\$17,885	\$17,885
INDUSTRIAL PROGRAMS - (WHEEL Out-Of-Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0		0		\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	565	3,194	\$299,556	\$299,556		2,995,650		\$98,044	\$28,823	\$5,132	\$33,955	\$431,557	\$431,557

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2002.
 *** Participants since 07/01/2002.

Year 2006													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 11 (1st HALF)													12A of
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (6)	NET LOST REVENUE (SIKWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (11)	COSTS TO BE RECOVERED (12)	
			PER PARTICIPANT (3)	(1)X(3)		(2)X(6)	(6)X(7)	(9)	(4)X(5%)	(9)X(10)	(4)X(9)X(11)		
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Energy Fitness													
Targeted Energy Efficiency	75	496	\$974.31	\$73,073	696	444,416	\$0.03111	\$13,826	\$0	\$3,654	\$0	\$0	
- All Electric													
- Non-All Electric	34	249	\$64.55	\$2,875	267	66,483	\$0.03124	\$2,077	\$671	\$671	\$0	\$5,023	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0	
- Residence Heat													
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	48	230	\$446.05	\$21,411	1,145	263,350	\$0.03110	\$8,190	\$3,802	\$3,802	\$0	\$33,403	
- Mobile Home													
Mobile Home New Construction ***	90	425	\$651.21	\$50,509	1,810	769,290	\$0.03110	\$23,824	\$11,246	\$11,246	\$0	\$85,679	
- Heat Pump													
- Air Conditioner	0	2	\$0.00	\$0	157	314	\$0.03124	\$10	\$0	\$0	\$0	\$10	
Modified Energy Fitness	440	2,185	\$275.33	\$121,144	613	1,335,405	\$0.03116	\$41,736	\$18,515	\$18,515	\$0	\$181,395	
TOTAL RESIDENTIAL PROGRAMS	587	3,587	\$269,012	\$269,012	2,883,218	2,883,218	\$0	\$89,763	\$34,234	\$37,668	\$0	\$386,653	
COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (W/Est. Opt-Outs Removed)	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	587	3,587	\$269,012	\$269,012	2,883,218	2,883,218	\$0	\$89,763	\$34,234	\$37,668	\$0	\$386,653	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2003.
 *** Participants since 07/07/2003.

Year 2006	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVQTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (6)	NET LOST REVENUE (SIKWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEARS PROGRAM												22
YEAR 11 (2ND HALF)												
PROGRAM DESCRIPTIONS			PER PARTICIPANT (3)	(1)X(3)						(4)X(10)		(4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	87	481	\$1,147.46	\$99,829	896	430,976	\$0.03111	\$13,408	\$0	\$4,991	\$4,991	\$118,228
- All Electric	46	254	\$84.00	\$3,864	256	67,584	\$0.03124	\$2,111	\$908	\$0	\$908	\$6,983
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulbs	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
- Non-Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	45	245	\$460.00	\$20,700	1,144	280,280	\$0.03110	\$8,717	\$3,564	\$0	\$3,564	\$32,981
- Mobile Home												
Mobile Home New Construction ***												
- Heat Pump	94	460	\$544.15	\$51,150	1,808	831,680	\$0.03110	\$25,885	\$11,746	\$0	\$11,746	\$88,761
- Air Conditioner	0	2	\$0.00	\$0	158	316	\$0.03124	\$10	\$0	\$0	\$0	\$10
Modified Energy Fitness	560	2,391	\$427.85	\$239,596	812	1,463,292	\$0.03116	\$45,596	\$23,565	\$0	\$23,565	\$308,757
TOTAL RESIDENTIAL PROGRAMS	832	3,893	\$415,139	\$415,139	3,074,108			\$95,707	\$39,763	\$4,991	\$44,774	\$555,620
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	832	3,893	\$415,139	\$415,139	3,074,108			\$95,707	\$39,763	\$4,991	\$44,774	\$555,620

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2003.
 *** Participants since 07/01/2003.

Year 2007													EXHIBIT C PAGE 19A of	22
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 12 (181 HALF)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVDTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF) (2)(X)9	NET LOST REVENUE (SIAWH) (7)	TOTAL NET * LOSS (8)	EFFICIENCY INCENTIVE (EX. C. PG.10C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE (9)(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)		
RESIDENTIAL PROGRAMS														
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0		
Tandem Energy Efficiency	128	295	\$1,022.27	\$130,851	895	264,320	\$0.04946	\$11,487	\$0	\$6,543	\$6,543	\$148,881		
- All Electric	20	115	\$66.48	\$2,508	277	31,655	\$0.04952	\$1,350	\$572	\$0	\$572	\$4,470		
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0		
- Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	50	153	\$450.00	\$22,500	1,145	175,185	\$0.04946	\$7,614	\$3,950	\$0	\$3,950	\$34,074		
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Mobile Home New Construction ***	64	304	\$563.10	\$47,300	1,610	550,240	\$0.04946	\$23,924	\$10,497	\$0	\$10,497	\$81,721		
- Bp	0	0	\$0.00	\$0	187	0	\$0.04943	\$0	\$0	\$0	\$0	\$0		
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Modified Energy Fitness	515	1,605	\$381.00	\$198,214	613	993,085	\$0.04948	\$42,788	\$21,671	\$0	\$21,671	\$280,673		
Case No 2005 - 00373, Dated December 14, 2005:														
- HEAP - Kentucky Power Company's Information Technology Implementation Costs				\$58,958								\$58,958		
- HEAP - KACA's Information Technology Implementation Costs				\$15,700								\$15,700		
TOTAL RESIDENTIAL PROGRAMS	808	2,472		\$474,041		2,005,465		\$87,203	\$38,700	\$6,543	\$43,243	\$804,487		
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL COMMERCIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0		
INDUSTRIAL PROGRAMS - (West. Opt-Out Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Compressor Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0		
TOTAL COMPANY	808	2,472		\$474,041		2,005,465		\$87,203	\$38,700	\$6,543	\$43,243	\$804,487		

* Least revenue and efficiency incentives are based on prescriptive values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/01/2005.
 *** Participants since 07/01/2005.

Year 2007												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 12 (2nd Half)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVQTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET* LOST REVENUES	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL* INCENTIVE	TOTAL ACTUAL COSTS TO BE RECOVERED
NUMBER (1)	NUMBER (2)	NUMBER (3)	PER PARTICIPANT COSTS (4)	TOTAL PROGRAM COSTS (5)	(KWH/ PARTICIPANT) (6)	(KWH/ HALF (7)	(KWH/ (8)	REVENUES (9)	(EX. C. PG-19C) (10)	(5% of COSTS) (11)	TOTAL* (12)	RECOVERED COSTS (13)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0.00	765	\$0.03112	\$0	\$0	\$0	\$0	\$0	\$0
Tamped Energy Efficiency	100	421	\$879.82	\$87,982	696	\$0.04346	\$16,394	\$16,394	\$0	\$4,399	\$4,399	\$106,775
- All Electric	50	151	\$89.56	\$4,479	276	\$0.04392	\$1,818	\$1,818	\$987	\$0	\$987	\$7,284
- Non-All Electric	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0.00	1,200	\$0.03114	\$0	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0.00	446	\$0.03116	\$0	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	45	209	\$450.00	\$20,250	1,144	\$0.04346	\$10,391	\$10,391	\$3,564	\$0	\$3,564	\$34,205
- Mobile Home	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction ***	129	425	\$551.94	\$71,200	1,808	\$0.04348	\$33,469	\$33,469	\$16,120	\$0	\$16,120	\$120,609
- Heat Pump	0	0	\$0.00	\$0.00	195	\$0.04343	\$0	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	485	2,113	\$353.79	\$171,990	612	\$0.04349	\$55,239	\$55,239	\$20,409	\$0	\$20,409	\$248,230
TOTAL RESIDENTIAL PROGRAMS	609	3,320	\$355.501	\$385,501	2,721,352	\$0.04346	\$118,331	\$118,331	\$41,080	\$4,399	\$45,479	\$519,311
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0.00	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0.00	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0.00	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0.00	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0.00	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	609	3,320	\$355.501	\$385,501	2,721,352	\$0.04346	\$118,331	\$118,331	\$41,080	\$4,399	\$45,479	\$519,311

* Local revenue and efficiency incentives are based on prospective values
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2005.
 *** Participants since 07/01/2005.

Year 2006													Exhibit C PAGE 14A of	22
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 13 (1st HALF)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE TOTAL * (9)+(10)	RECOVERED COSTS TO BE (11)	TOTAL ACTUAL COSTS TO BE (12)	
RESIDENTIAL PROGRAMS														
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency														
- All Electric	119	521	\$1,358.15	\$161,820	1,016	529,336	\$0.04346	\$23,005	\$9,189	\$0	\$9,189	\$193,814		
- Non-All Electric	56	186	\$63.11	\$4,854	568	111,328	\$0.04345	\$4,837	\$3,454	\$0	\$3,454	\$12,945		
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	61	252	\$457.38	\$27,900	675	220,500	\$0.04346	\$9,583	\$8,539	\$0	\$8,539	\$46,022		
- Mobile Home														
Mobile Home New Construction ***														
- Heat Pump	95	520	\$552.03	\$52,500	861	447,720	\$0.04348	\$19,467	\$10,597	\$0	\$10,597	\$82,564		
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Modified Energy Fitness	560	2,612	\$361.32	\$202,339	495	1,198,220	\$0.04349	\$49,414	\$27,871	\$0	\$27,871	\$279,624		
TOTAL RESIDENTIAL PROGRAMS	891	4,101		\$449,013		2,445,104		\$106,306	\$59,650	\$0	\$59,650	\$614,969		
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
- Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0		
Smart Financing - New Building	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0		
TOTAL COMMERCIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
INDUSTRIAL PROGRAMS - (West. On-Code Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
- Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL COMPANY	891	4,101		\$449,013		2,445,104		\$106,306	\$59,650	\$0	\$59,650	\$614,969		

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2005.
 *** Participants since 07/01/2006.

Year 2008												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 13 (2nd HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (2X(5)) (6)	NET LOST REVENUE (KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4X(5%))	EXHIBIT C PAGE 14B of 22	TOTAL * INCENTIVE RECOVERED (11) (9)+(10) (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Targeted Energy Efficiency	80	545	\$691.21	\$88,218	1,016	553,720	\$0.04346	\$24,065	\$6,873	\$0		\$6,873
- All Electric	20	223	\$97.50	\$1,750	568	126,664	\$0.04345	\$5,504	\$1,234	\$0		\$1,234
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
High - Efficiency Heat Pump	74	289	\$442.57	\$32,750	874	252,586	\$0.04346	\$10,977	\$10,359	\$0		\$10,359
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Mobile Home New Construction	108	548	\$650.00	\$59,400	660	471,280	\$0.04348	\$20,491	\$12,047	\$0		\$12,047
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Modified Energy Fitness	440	2,793	\$356.35	\$156,792	435	1,214,955	\$0.04349	\$52,838	\$21,899	\$0		\$21,899
TOTAL RESIDENTIAL PROGRAMS	731	4,398	\$338.910	\$338,910	5,113	2,610,205	\$113.875	\$52,412	\$52,412	\$0		\$52,412
COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0		\$0
- Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0		\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
INDUSTRIAL PROGRAMS - (WHEEL Out-Of-Service Removed)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0		\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0		\$0
Smart Financing - General	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0		\$0
TOTAL COMPANY	731	4,398	\$338.910	\$338,910	5,113	2,610,205	\$113.875	\$52,412	\$52,412	\$0		\$52,412
* Lost revenue and efficiency incentives are based on prospective values.												
** Cumulative participants include a reduction for the cumulative participants as of 01/01/2006.												

PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOSS REVENUES (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (6) (2)(X)(5)	NET LOSS REVENUES (SRWH) (7)	TOTAL NET * (8) (6)(X)(7)	EFFICIENCY INCENTIVE (EX. C, PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X)(5%)	TOTAL * INCENTIVE (11) (9)(X)(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(8)+(11)
Year 2009												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	119	575	\$1,050.16	\$126,159	1,016	564,200	\$0.04346	\$25,369	\$9,189	\$0	\$9,189	\$160,737
- All Electric	22	210	\$93.27	\$2,052	568	119,280	\$0.04352	\$5,191	\$1,357	\$0	\$1,357	\$9,600
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	61	299	\$449.18	\$27,400	875	261,625	\$0.04350	\$11,381	\$8,539	\$0	\$8,539	\$47,320
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction	88	552	\$552.84	\$48,660	661	475,272	\$0.04351	\$20,679	\$9,816	\$0	\$9,816	\$78,145
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	425	2,775	\$983.51	\$162,993	435	1,207,125	\$0.04345	\$52,450	\$21,152	\$0	\$21,152	\$236,595
High Efficiency Heat Pump	28	7	\$305.36	\$8,560	1,879	13,153	\$0.04349	\$572	\$13,387	\$0	\$13,387	\$22,509
- Resistance Heat Replacement	61	16	\$442.62	\$27,000	301	4,816	\$0.04353	\$210	\$0	\$1,350	\$1,350	\$28,560
- Heat Pump Replacement	0	0	\$0.00	\$0	92	0	\$0.04370	\$0	\$0	\$0	\$0	\$0,139
Energy Education for Student Program (NEED)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Community Outreach Program (CFL)	926	149	\$5.64	\$5,404	92	13,708	\$0.04370	\$599	\$4,621	\$0	\$4,621	\$10,624
TOTAL RESIDENTIAL PROGRAMS	1,730	4,593	\$416.347	\$416,347	2,679,179	\$116,471	\$116,471	\$69,411	\$1,350	\$69,411	\$602,229	
COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removal)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	1,730	4,593	\$416.347	\$416,347	2,679,179	\$116,471	\$116,471	\$69,411	\$1,350	\$69,411	\$602,229	
* Last revenue and efficiency incentives are based on prospective values.												
** Cumulative participants include a reduction for the cumulative participants as of 07/01/2006.												
*** Cumulative participants include a reduction for the cumulative participants as of 07/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).												

Year 2009													Exhibit C PAGE 188 of 22
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 14 (2nd HALF)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (5)	TOTAL ENERGY SAVINGS (6)	NET LOST REVENUE (7)	REVENUES (8)	EFFICIENCY INCENTIVE (9) (EX. C, PG.19C)	MAXIMIZING INCENTIVE (10) (5% of COSTS)	TOTAL * (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(8)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	140	620	\$993.48	\$139,087	1,016	629,920	\$0.04546	\$27,376	\$10,811	\$0	\$10,811	\$177,274	
- Non-All Electric	61	200	\$101.34	\$6,162	568	113,600	\$0.04552	\$4,944	\$3,762	\$0	\$3,762	\$14,868	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	99	342	\$449.49	\$44,500	874	288,908	\$0.04550	\$13,002	\$13,859	\$0	\$13,859	\$71,361	
Mobile Home New Construction													
- Heat Pump	103	556	\$544.17	\$56,050	860	478,160	\$0.04551	\$20,805	\$11,490	\$0	\$11,490	\$68,345	
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness													
- Heat Pump	375	2,631	\$372.99	\$139,871	495	1,144,485	\$0.04545	\$49,728	\$18,664	\$0	\$18,664	\$208,263	
High Efficiency Heat Pump													
- Resistance Heat Replacement	63	60	\$514.29	\$32,400	1,879	112,740	\$0.04549	\$4,903	\$30,120	\$0	\$30,120	\$67,423	
- Heat Pump Replacement	136	144	\$461.92	\$70,500	300	43,200	\$0.04553	\$1,860	\$3,525	\$0	\$3,525	\$75,905	
Energy Education for Student Program (NEED)													
- Community Outreach Program (CFL)	1,130	958	\$8.00	\$9,045	92	51,335	\$0.04570	\$2,243	\$5,627	\$0	\$5,627	\$16,915	
TOTAL RESIDENTIAL PROGRAMS	2,818	2,901	\$10.19	\$28,715	92	230,092	\$0.04570	\$10,095	\$14,062	\$0	\$14,062	\$52,892	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	4,945	7,612	\$526.350	\$2,596,350	3,102,441	3,102,441	\$0.04570	\$134,936	\$108,395	\$3,525	\$111,920	\$773,206	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS -													
(West, On-Cuts Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	4,945	7,612	\$526.350	\$2,596,350	3,102,441	3,102,441	\$0.04570	\$134,936	\$108,395	\$3,525	\$111,920	\$773,206	

* Last revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2007.
 *** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2010	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOSS REV/OUTS (5)	TOTAL ENERGY SAVINGS (6)	NET REVENUE (7)	TOTAL NET* (8)	EFFICIENCY INCENTIVE (9)	MAXIMIZING INCENTIVE (10)	TOTAL* (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
PROGRAM DESCRIPTIONS	NUMBER	NUMBER	PER PARTICIPANT (4)/(1)	PROGRAM COSTS (4)	(KWH/PARTICIPANT) (5)	(KWH) (6)	(\$/KWH) (7)	REVENUES (8)	(EX. C. PG. 19C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	RECOVERED (12)
RESIDENTIAL PROGRAMS	0	0	0	0	0	0	0	0	0	0	0	0
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	174	720	\$1,161.51	\$202,103	1,016	734,520	\$0.04346	\$31,792	\$13,436	\$0	\$13,436	\$247,831
- All Electric	31	237	\$114.10	\$3,537	568	134,616	\$0.04352	\$5,659	\$1,912	\$0	\$1,912	\$11,307
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	97	416	\$422.16	\$40,950	875	364,000	\$0.04350	\$15,834	\$13,579	\$0	\$13,579	\$70,363
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction	115	621	\$627.63	\$68,700	661	534,681	\$0.04351	\$23,264	\$4,462	\$0	\$4,462	\$88,426
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	501	2,762	\$392.69	\$196,696	435	1,201,470	\$0.04345	\$52,204	\$24,935	\$0	\$24,935	\$273,975
High Efficiency Heat Pump	97	135	\$450.00	\$43,650	1,879	253,655	\$0.04349	\$11,032	\$46,376	\$0	\$46,376	\$101,058
- Resistance Heat Replacement	272	348	\$416.73	\$113,350	301	104,748	\$0.04353	\$4,560	\$0	\$5,668	\$5,668	\$123,578
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Education for Student Program (NEED)	486	1,299	\$60.99	\$24,881	73	94,827	\$0.04327	\$4,103	\$2,430	\$0	\$2,430	\$31,414
Community Outreach Program (CFL)	2,644	4,482	\$16.10	\$42,364	91	407,862	\$0.04376	\$17,848	\$13,194	\$0	\$13,194	\$73,606
TOTAL RESIDENTIAL PROGRAMS	4,419	11,020		\$728,571		3,627,389		\$166,495	\$120,324	\$5,668	\$125,992	\$1,021,058
COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1 (WEEK On-Offs Removed)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	4,419	11,020		\$728,571		3,627,389		\$166,495	\$120,324	\$5,668	\$125,992	\$1,021,058

* Net revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/07/2007.
 *** Cumulative participants include a reduction for the cumulative participants as of 01/07/2007 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2010												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/CITRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/CITRS (2)X(5)	NET REVENUE (SIKWH) (7)	TOTAL NET* REVENUES (8) (6)X(7)	EFFICIENCY INCENTIVE (EX C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(5%)	INCENTIVE TOTAL* (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	172	767	\$809.62	\$139,254	1,016	799,592	\$0.05746	\$45,945	\$13,282	\$0	\$13,282	\$199,481
- All Electric	23	242	\$102.35	\$2,354	568	137,456	\$0.05746	\$7,898	\$1,419	\$0	\$1,419	\$11,671
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	136	456	\$469.49	\$63,850	875	434,000	\$0.05750	\$24,955	\$19,039	\$0	\$19,039	\$107,844
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction	119	617	\$559.62	\$66,500	661	531,237	\$0.05745	\$30,520	\$13,274	\$0	\$13,274	\$10,294
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	699	2,939	\$317.39	\$221,857	435	1,278,465	\$0.05752	\$71,537	\$34,789	\$0	\$34,789	\$330,183
High Efficiency Heat Pump	155	264	\$326.00	\$50,530	1,879	485,058	\$0.05746	\$28,513	\$71,106	\$0	\$71,106	\$153,149
- Resistance Heat Replacement	237	621	\$399.79	\$132,970	301	186,921	\$0.05750	\$10,748	\$0	\$0	\$0	\$150,052
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Education for Student Program (NEED)	1,059	1,220	\$5.55	\$5,980	74	90,286	\$0.05714	\$5,159	\$5,274	\$0	\$5,274	\$16,313
Community Outreach Program (CFL)	2,167	3,516	\$6.72	\$14,570	91	319,956	\$0.05768	\$18,455	\$10,813	\$0	\$10,813	\$43,638
Residential Efficient Products	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Compact Fluorescent Lamp (CFL)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Specialty Bulbs	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- LED Lights	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
HVAC Diagnostic & Tune-Up	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$101.79	\$2,850	371	1,113	\$0.05749	\$64	\$319	\$0	\$319	\$3,233
- Heat Pump	28	3	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Residential Load Management (Pilot Program)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	4,795	10,705	\$245.076	\$709,315	4,275	14,275,076	\$0.05749	\$245,794	\$172,315	\$5,634	\$178,949	\$1,125,058

Year 2010		NEW PARTICIPANT		CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVENUE	ENERGY SAVINGS	NET LOST REVENUE	REVENUE	REVENUES	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	INCENTIVE TOTAL*	TOTAL ACTUAL COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVENUE (5)	ENERGY SAVINGS (6)	NET LOST REVENUE (7)	REVENUES (8)	EFFICIENCY INCENTIVE (9)	MAXIMIZING INCENTIVE (10)	INCENTIVE TOTAL* (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	REVENUES (13)	REVENUES (14)	REVENUES (15)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM															
YEAR 15 (2nd HALF)															22
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVENUE (5)	ENERGY SAVINGS (6)	NET LOST REVENUE (7)	REVENUES (8)	EFFICIENCY INCENTIVE (9)	MAXIMIZING INCENTIVE (10)	INCENTIVE TOTAL* (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	REVENUES (13)	REVENUES (14)	REVENUES (15)
COMMERCIAL PROGRAMS			(4)/(1)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program															
- Air Conditioner Replacement	0	0	\$0.00	\$0	0	0	\$0.14803	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.68559	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
HVAC Diagnostic & Tune-Up	0	0	\$0.00	\$0	0	0	\$0.06460	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$125.00	\$125	0	0	\$0.06476	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$155
- Heat Pump	1	0	\$125.00	\$125	0	0	\$0.06476	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$155
Commercial Load Management (Pilot Program)															
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial Incentive	0	0	\$0.00	\$0	0	0	\$0.25657	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	1	0		\$125	0	0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$155
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)															
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	4,796	10,705		\$700,440	4,275,076		\$245,794	\$172,345	\$5,634	\$178,979	\$1,225,213				

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 04/01/2007.
 *** Cumulative participants include a reduction for the cumulative participants as of 07/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2011													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 17A-2 of 22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/INTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ QTR) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* LOSST (8)	EFFICIENCY INCENTIVE (EX. C, PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(8)+(11)	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Commercial A/C & Heat Pump Program													
- Air Conditioner Replacement	1	1	\$300.00	\$300	140	0	\$0.05482	\$0	\$1	\$0	\$1	\$301	
- Heat Pump Replacement	15	4	\$256.67	\$3,950	550	2,232	\$0.05482	\$145	\$872	\$0	\$872	\$4,822	
HVAC Diagnostic & Tune-Up													
- Air Conditioner	1	1	\$0.00	\$0	343	0	\$0.05480	\$0	\$7	\$0	\$7	\$7	
- Heat Pump	18	8	\$72.22	\$1,300	818	6,541	\$0.05476	\$424	\$532	\$0	\$532	\$2,256	
Commercial Load Management (Pilot Program)													
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Commercial Incentive	0	0	\$0.00	\$0	0	0	\$0.05503	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	35	12		\$5,450		8,776		\$589	\$1,412	\$0	\$1,412	\$7,431	
INDUSTRIAL PROGRAMS - (West. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	82,898	34,519		\$788,105		4,474,137		\$257,531	\$137,167	\$42	\$137,209	\$1,182,646	

* Lost revenue and efficiency incentives are based on prospective values.

** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2011													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 16 (2nd HALF)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REV/QTRS (5)	TOTAL ENERGY SAVINGS KWH/ QTRs (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (8)(X7)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	RECOVERED COSTS TO BE (12)	RECOVERED COSTS TO BE (4)+(9)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Energy Fitness													
Tamped Energy Efficiency	141	769	\$1,428.37	\$201,400	525	404,494	\$0.05749	\$23,254	\$20,833	\$0	\$20,833	\$245,487	\$245,487
- All Electric	23	195	\$114.30	\$2,629	224	43,880	\$0.05746	\$2,510	\$0	\$131	\$131	\$5,270	\$5,270
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	114	552	\$417.85	\$47,635	702	387,504	\$0.05750	\$22,281	\$33,491	\$0	\$33,491	\$103,407	\$103,407
- Mobile Home													
Mobile Home New Construction													
- Heat Pump	92	603	\$600.38	\$46,035	365	220,095	\$0.05749	\$12,653	\$8,649	\$0	\$8,649	\$67,337	\$67,337
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	556	3,354	\$387.49	\$221,004	142	476,268	\$0.05757	\$27,419	\$8,151	\$0	\$8,151	\$256,574	\$256,574
High Efficiency Heat Pump	121	483	\$480.50	\$58,140	365	176,295	\$0.05745	\$10,128	\$9,453	\$0	\$9,453	\$77,721	\$77,721
- Resistance Heat Replacement	194	678	\$466.22	\$90,446	461	312,558	\$0.05760	\$17,972	\$22,809	\$0	\$22,809	\$131,326	\$131,326
- Heat Pump Replacement													
Energy Education for Student Program (NEED)	958	3,383	\$12.90	\$12,361	24	81,192	\$0.05760	\$4,669	\$1,648	\$0	\$1,648	\$18,678	\$18,678
Community Outreach Program (CFL)	2,387	3,845	\$3.88	\$9,335	25	98,970	\$0.05765	\$5,763	\$9,396	\$0	\$9,396	\$24,494	\$24,494
Residential Efficient Products													
- Compact Fluorescent Lamp (CFL)	55,928	28,215	\$3.06	\$170,927	8	225,720	\$0.05818	\$13,132	\$17,338	\$0	\$17,338	\$201,397	\$201,397
- Specialty Bulbs	0	0	\$0.00	\$55	7	0	\$0.05793	\$0	\$0	\$0	\$0	\$26	\$26
- LED Light	0	0	\$0.00	\$1,123	10	0	\$0.05854	\$0	\$0	\$0	\$0	\$1,123	\$1,123
HVAC Diagnostic & Tune-Up													
- Air Conditioner	168	101	\$142.19	\$23,888	78	7,878	\$0.05749	\$453	\$220	\$0	\$220	\$24,561	\$24,561
- Heat Pump	440	178	\$118.61	\$52,188	165	32,930	\$0.05749	\$1,693	\$5,007	\$0	\$5,007	\$59,086	\$59,086
Residential Load Management (Pilot Program)													
- Air Conditioner	6	1	\$8,624.83	\$51,749	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$51,749	\$51,749
- Water Heating	4	1	\$12,937.25	\$51,749	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$51,749	\$51,749
TOTAL RESIDENTIAL PROGRAMS	61,142	42,366		\$1,040,637		2,468,584		\$142,127	\$137,094	\$131	\$137,225	\$1,319,889	\$1,319,889

Year 2011		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ESTIMATED PROGRAM COSTS		TOTAL ESTIMATED PROGRAM COSTS		NET LOST		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET * LOSS		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * COSTS TO BE ESTIMATED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	PROGRAM COSTS (4)	REV/QTRS (5)	(KWH) PARTICIPANT (6)	REVENUE (KWH) (7)	REVENUES (8)	EX. C. PG.19C (9)	(% of COSTS) (10)	INCENTIVE (9)+(10)	RECOVERED (12)	TOTAL * (11)	(4)*(5)	(6)*(7)	(8)	(9)	(10)	(11)	(12)	TOTAL * (11)	RECOVERED (12)	TOTAL * COSTS TO BE ESTIMATED
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																							
YEAR 16 (2nd HALF)																							
COMMERCIAL PROGRAMS																							
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program	2	1	\$4,053.00	\$8,106	71	71	\$0.07447	\$5	\$2	71	\$0.07447	\$5	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2
- Air Conditioner Replacement	6	2	\$1,876.33	\$11,258	279	279	568	\$0.07430	\$41	279	\$0.07430	\$41	\$49	\$49	\$49	\$49	\$49	\$49	\$49	\$49	\$49	\$49	\$49
- Heat Pump Replacement	45	68	\$223.55	\$15,735	172	172	5,160	\$0.07424	\$383	172	\$0.07424	\$383	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326
HVAC Diagnostic & Tune-Up	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial Incentive	16	2	\$14,017.44	\$264,279	3,739	3,739	7,478	\$0.07512	\$562	3,739	\$0.07512	\$562	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852	\$42,852
TOTAL COMMERCIAL PROGRAMS	159	82		\$311,787			\$2,537	\$2,423	\$46,130		\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130	\$46,130
INDUSTRIAL PROGRAMS - (WEST. ORC-OUTS REMOVED)																							
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0			0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	61,301	42,440		\$1,352,424			2,501,121	\$144,550	\$183,224		\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224	\$183,224
* Lost revenue and efficiency incentives are based on prospective values.																							
** Cumulative participants include a reduction for the cumulative participants as of 01/07/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).																							

Year 2012													Exhibit C PAGE 18A-1 of 22	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS PER PARTICIPANT (4)/(1)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REVENUE (SAWH) (7)	NET LOST REVENUE (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE (11)	TOTAL NET * (9)+(10)	INCENTIVE (12)	TOTAL ESTIMATED COSTS TO BE RECOVERED (4)+(9)+(11)		
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Energy Fitness	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Targeted Energy Efficiency	142	854	\$1,210.97	\$171,958	890	\$48,115	\$15,221	\$0	\$15,221	\$15,221	\$0	\$235,284		
- All Electric	13	165	\$101.00	\$1,313	437	\$4,143	\$0	\$56	\$56	\$56	\$0	\$5,522		
- Non-All Electric	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
- Resistance Heat	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	110	439	\$478.64	\$52,650	1,291	\$32,958	\$25,043	\$0	\$25,043	\$25,043	\$0	\$111,281		
- Mobile Home	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Mobile Home New Construction	79	575	\$650.00	\$43,450	841	\$27,801	\$6,564	\$0	\$6,564	\$6,564	\$0	\$77,805		
- Heat Pump	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
- Air Conditioner	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Modified Energy Fitness	646	3,301	\$322.61	\$208,406	325	\$61,763	\$4,115	\$0	\$4,115	\$4,115	\$0	\$274,286		
High Efficiency Heat Pump	89	208	\$455.11	\$40,050	670	\$8,006	\$3,459	\$0	\$3,459	\$3,459	\$0	\$51,514		
- Resistance Heat Replacement	217	378	\$466.59	\$101,250	848	\$18,431	\$19,218	\$0	\$19,218	\$19,218	\$0	\$138,899		
- Heat Pump Replacement	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Energy Education for Student Program (NEED)	525	2,677	\$17.61	\$9,245	110	\$16,932	\$1,664	\$0	\$1,664	\$1,664	\$0	\$27,841		
Community Outreach Program (CFL)	2,335	5,934	\$9.68	\$22,614	124	\$42,420	\$11,138	\$0	\$11,138	\$11,138	\$0	\$76,172		
Residential Efficiency Products	51,481	32,225	\$3.27	\$168,572	23	\$43,122	\$43,759	\$0	\$43,759	\$43,759	\$0	\$255,453		
- Compact Fluorescent Lamp (CFL)	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
- Specialty Bulbs	0	0	\$0.00	\$584	21	\$0	\$0	\$29	\$29	\$29	\$0	\$613		
- LED Lighting	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
HVAC Diagnostic & Tune-Up	147	69	\$121.90	\$17,919	62	\$246	\$0	\$895	\$895	\$895	\$0	\$19,051		
- Air Conditioner	324	235	\$109.32	\$35,419	234	\$5,430	\$0	\$1,771	\$1,771	\$1,771	\$0	\$40,620		
- Heat Pump	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Residential Lead Management (Pilot Program)	36	17	\$1,441.58	\$51,897	0	\$0	\$0	\$0	\$0	\$0	\$0	\$51,897		
- Air Conditioner	32	16	\$1,621.78	\$51,897	0	\$0	\$0	\$0	\$0	\$0	\$0	\$51,897		
- Water Heating	0	0	\$0.00	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
TOTAL RESIDENTIAL PROGRAMS	56,175	47,112	\$97.245	\$977,245	5,327,467	\$306,997	\$131,170	\$2,763	\$2,763	\$306,997	\$131,170	\$1,418,175		

Year 2012													Exhibit C PAGE 10A-2 of 22
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 17 (1st half)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REVENUES (KWH/RTS) (5)	TOTAL ENERGY SAVINGS (KWH/RTS) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* LOSSES (8)	EFFICIENCY INCENTIVE (EX. C, PG-19C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL* INCENTIVE (11)	TOTAL ESTIMATED COSTS TO BE RECOVERED (12)	
			(4)/(1)		(KWH/RTS) (5)	(2)(5)	(\$/KWH) (7)	(6)(7)	(9)	(4)(10)	(9)+(10)	(4)+(8)+(11)	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Commercial A/C & Heat Pump Program	1	0	\$6,342.00	\$6,342	125	0	\$0.07447	\$0	\$0	\$317	\$317	\$6,659	
- Air Conditioner Replacement	10	2	\$1,044.10	\$10,441	594	1,188	\$0.07430	\$88	\$0	\$522	\$522	\$11,051	
- Heat Pump Replacement													
HVAC Diagnostic & Tune-Up	24	11	\$310.45	\$7,451	114	1,254	\$0.07424	\$83	\$0	\$373	\$373	\$7,917	
- Air Conditioner	56	22	\$222.34	\$12,451	348	7,656	\$0.07429	\$559	\$0	\$523	\$523	\$13,643	
- Heat Pump													
Commercial Load Management (Pilot Program)	0	0	\$0.00	\$7,630	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$7,630	
- Air Conditioner	0	0	\$0.00	\$7,631	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$7,631	
- Water Heating													
Commercial Incentive	24	6	\$13,772.13	\$330,531	8,788	52,728	\$0.07512	\$3,981	\$0	\$16,527	\$16,527	\$351,019	
TOTAL COMMERCIAL PROGRAMS	115	41		\$382,177		62,826		\$4,711	\$0	\$16,362	\$16,362	\$405,950	
INDUSTRIAL PROGRAMS - (West. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	56,290	47,153		\$1,359,722		5,990,313		\$311,708	\$131,170	\$21,125	\$152,295	\$1,823,725	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 07/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2012													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 17 (3rd QTR)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS (3) (417/1)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REV/CTRS (5) (6)/	TOTAL ENERGY SAVINGS KWH/ CTRS (6) (2X/5)	NET LOST REVENUE (7) (8)/KWH	TOTAL NET* REVENUES (8) (9)/X7	EFFICIENCY INCENTIVE (EX. C. PG.18C) (9)	MAXIMIZING INCENTIVE (% of COSTS) (10) (4)X(5%)	TOTAL* INCENTIVE (11) (9)X(10)	TOTAL ESTIMATED COSTS TO BE RECOVERED (12) (4)X(8)X(11)	EXHIBIT C PAGE 18B-1 of 22
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency	67	873	\$566.73	\$37,771	491	426,643	\$0.05749	\$24,643	\$7,182	\$0	\$7,182	\$96,596	
- All Electric	6	146	\$40.97	\$244	218	31,828	\$0.05746	\$1,029	\$12	\$12	\$12	\$2,085	
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	48	566	\$417.31	\$20,031	646	365,636	\$0.05747	\$21,013	\$11,364	\$0	\$11,364	\$52,408	
- Mobile Home													
Mobile Home New Construction	57	553	\$552.25	\$31,478	420	232,260	\$0.05747	\$13,348	\$4,729	\$0	\$4,729	\$48,555	
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Air Conditioner													
Modified Energy Fitness	320	3,372	\$383.49	\$122,718	163	649,636	\$0.05751	\$31,610	\$2,038	\$0	\$2,038	\$156,366	
High Efficiency Heat Pump	40	132	\$444.83	\$17,783	336	44,892	\$0.05750	\$2,550	\$1,572	\$0	\$1,572	\$21,915	
- Resistance Heat Replacement	143	286	\$436.05	\$62,355	425	121,550	\$0.05748	\$6,984	\$12,864	\$0	\$12,864	\$82,003	
- Heat Pump Replacement	400	1,193	\$11.23	\$4,491	56	66,008	\$0.05730	\$3,628	\$1,268	\$0	\$1,268	\$9,587	
Energy Education for Student Program (NEED)	1,550	3,010	\$14.56	\$24,021	62	186,620	\$0.05758	\$10,746	\$7,871	\$0	\$7,871	\$42,658	
Community Outreach Program (CFL)	41,388	65,893	\$2.10	\$86,595	12	938,566	\$0.05739	\$48,127	\$35,180	\$0	\$35,180	\$170,213	
Residential Efficient Products	16	3	\$64.31	\$1,029	7	21	\$0.05793	\$1	\$5	\$0	\$5	\$1,049	
- Compact Fluorescent Lamp (CFL)	23	4	\$0.96	\$22	10	40	\$0.05854	\$2	\$1	\$1	\$1	\$25	
- Energy Bulbs													
- LED Lights	78	95	\$171.95	\$13,412	32	3,040	\$0.05714	\$174	\$0	\$671	\$671	\$14,257	
HVAC Diagnostic & Tune-Up	176	170	\$117.97	\$20,745	117	19,990	\$0.05744	\$1,142	\$0	\$1,097	\$1,097	\$22,924	
- Air Conditioner													
- Heat Pump													
Residential Load Management (Pilot Program)	35	50	\$1,103.29	\$38,615	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$38,615	
- Air Conditioner	35	46	\$1,103.29	\$38,615	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$38,615	
- Water Heating													
TOTAL RESIDENTIAL PROGRAMS	44,482	80,382	\$547.246	\$24,246		2,886,920	\$0.05744	\$155,997	\$83,873	\$1,721	\$85,594	\$799,837	

Year 2012													Page
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													188-2 of
YEAR 17 (3rd QTR)													22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS (3) (4)/(1)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REVENUE (KWH PARTICIPANT) REV/CTRS (5)	TOTAL ENERGY SAVINGS KWH CTRs (2)(X5) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* LOSSES (8)	EFFICIENCY INCENTIVE (EX. C. PG.19C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X5%)	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ESTIMATED COSTS TO BE RECOVERED (12) (4)+(9)+(11)	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Commercial A/C & Heat Pump Program													
- Air Conditioner Replacement	16	16	\$551.75	\$8,828	63	504	\$0.07458	\$38	\$0	\$441	\$9,307	\$9,307	
- Heat Pump Replacement	16	7	\$773.56	\$12,317	297	2,079	\$0.07441	\$155	\$0	\$619	\$13,151	\$13,151	
HVAC Diagnostic & Tune-Up													
- Air Conditioner	26	30	\$241.56	\$6,281	58	1,740	\$0.07461	\$130	\$0	\$314	\$6,725	\$6,725	
- Heat Pump	45	45	\$169.31	\$7,619	174	7,930	\$0.07438	\$592	\$0	\$381	\$8,562	\$8,562	
Commercial Load Management (Pilot Program)													
- Air Conditioner	4	2	\$1,042.25	\$4,169	0	0	\$0.00000	\$0	\$0	\$0	\$4,169	\$4,169	
- Water Heating	4	2	\$1,042.25	\$4,169	0	0	\$0.00000	\$0	\$0	\$0	\$4,169	\$4,169	
Commercial Incentive	53	24	\$9,075.74	\$428,014	4,394	105,456	\$0.07235	\$7,630	\$0	\$21,401	\$457,045	\$457,045	
TOTAL COMMERCIAL PROGRAMS	164	118		\$471,457		117,699		\$8,595	\$0	\$23,156	\$503,148	\$503,148	
INDUSTRIAL PROGRAMS - (w/SEL Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	44,646	80,500		\$1,018,703		3,005,529		\$174,532	\$83,873	\$24,877	\$108,750	\$1,301,965	

* Lost revenue and efficiency incentives are based on prospective values.

** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2012		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ESTIMATED PROGRAM COSTS		TOTAL ESTIMATED PROGRAM COSTS		NET LOST		TOTAL ENERGY SAVINGS		NET REVENUE		TOTAL NET * REVENUES		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * RECOVERED COSTS TO BE		
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	NUMBER (3)	PER PARTICIPANT COSTS (4)/(1)	TOTAL ESTIMATED COSTS (4)	REV/QTRS (5)	(KWH/ PARTICIPANT) (6)	TOTAL QTRS (2)(X)(5)	REVENUE (\$/KWH) (7)	REVENUES (8)	INCENTIVE (9)	(EX. C. PG-19C) (9)	(% OF COSTS) (10)	INCENTIVE (9)+(10)	TOTAL * (4)+(9)+(11)									
RESIDENTIAL PROGRAMS																								
Energy Fitness	0	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0		\$0	\$0	\$0	\$0	\$0					\$0	
Targeted Energy Efficiency																								
- All Electric	66	639	**	\$981.38	\$64,771	491	411,940	0.05749	\$7,075	\$23,663	\$7,075	\$0	\$0	\$7,075	\$05,629									
- Non-All Electric	6	105	**	\$40.67	\$244	218	22,890	\$0.05746	\$1,315	\$12	\$12	\$0	\$0	\$12	\$1,571									
Compact Fluorescent Bulb	0	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0									
High - Efficiency Heat Pump	0	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0									
- Resistance Heat	0	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0									
- Non Resistance Heat	0	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0									
High - Efficiency Heat Pump	52	265	**	\$419.60	\$21,819	646	171,190	\$0.05747	\$9,838	\$12,311	\$12,311	\$0	\$0	\$12,311	\$43,969									
Mobile Home New Construction																								
- Heat Pump	54	558	**	\$552.26	\$29,822	420	234,360	\$0.05747	\$13,469	\$4,460	\$4,460	\$0	\$0	\$4,460	\$47,771									
- Air Conditioner	0	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0									
Modified Energy Fitness	250	3,515		\$383.50	\$95,874	163	572,945	\$0.05751	\$32,950	\$1,593	\$1,593	\$0	\$0	\$1,593	\$190,417									
High Efficiency Heat Pump	47	141	**	\$444.83	\$20,907	336	47,376	\$0.05750	\$2,724	\$1,847	\$1,847	\$0	\$0	\$1,847	\$25,476									
- Resistance Heat Replacement	115	207	**	\$436.04	\$50,145	425	87,975	\$0.05746	\$5,055	\$10,184	\$10,184	\$0	\$0	\$10,184	\$65,384									
- Heat Pump Replacement	1,075	1,890		\$16.71	\$17,964	55	105,840	\$0.05730	\$6,065	\$3,408	\$3,408	\$0	\$0	\$3,408	\$27,437									
Community Outreach Program (CFL)	815	4,864	**	\$14.55	\$11,865	62	204,208	\$0.05759	\$16,365	\$3,666	\$3,666	\$0	\$0	\$3,666	\$52,118									
Residential Efficient Products																								
- Compact Fluorescent Lamp (CFL)	41,388	113,938	**	\$2.10	\$66,906	12	1,367,256	\$0.05739	\$79,467	\$35,180	\$35,180	\$0	\$0	\$35,180	\$200,553									
- Specialty Bulbs	9	8		\$64.33	\$579	7	56	\$0.05783	\$3	\$3	\$3	\$0	\$0	\$3	\$65									
- LED Lightbulbs	752	316		\$0.94	\$704	10	3,160	\$0.05854	\$165	\$35	\$35	\$0	\$0	\$35	\$924									
HVAC Diagnostic & Tune-Up																								
- Air Conditioner	25	31	**	\$171.96	\$4,299	32	992	\$0.05714	\$67	\$215	\$215	\$0	\$0	\$215	\$4,571									
- Heat Pump	250	411	**	\$117.67	\$29,467	117	48,087	\$0.05744	\$2,762	\$1,473	\$1,473	\$0	\$0	\$1,473	\$33,702									
Residential Load Management (Pilot Program)																								
- Air Conditioner	39	92	**	\$1,103.28	\$43,028	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$43,028									
- Water Heating	86	39	**	\$1,103.28	\$43,028	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$43,028									
TOTAL RESIDENTIAL PROGRAMS	44,992	126,988			\$421,422		3,568,284		\$192,938	\$79,969	\$79,969	\$1,735	\$1,735	\$81,704	\$795,054									

Year 2012		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ESTIMATED PROGRAM COSTS		TOTAL ESTIMATED PROGRAM COSTS		NET LOST REVENUE		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET * LOSSES		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * COSTS TO BE ESTIMATED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REV/QTRS (5)	NET LOST REVENUE (S/KWH) (6)	TOTAL ENERGY SAVINGS KWH/QTR (7)	REVENUES (S/KWH) (8)	INCENTIVE (EX. C, PG.49C) (9)	INCENTIVE (9% of COSTS) (10)	INCENTIVE (9% of COSTS) (11)	RECOVERED COSTS (12)	INCENTIVE (9% of COSTS) (13)	REVENUES (S/KWH) (14)	INCENTIVE (9% of COSTS) (15)	REVENUES (S/KWH) (16)	INCENTIVE (9% of COSTS) (17)	INCENTIVE (9% of COSTS) (18)	INCENTIVE (9% of COSTS) (19)	RECOVERED COSTS (20)	INCENTIVE (9% of COSTS) (21)	RECOVERED COSTS (22)	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																							
YEAR 17 (4th QTR)																							
COMMERCIAL PROGRAMS																							
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	0	\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	n/a	0	\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	\$0.0000	0	\$0	\$0	0	\$0.0000	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	\$0.0000	0	\$0	\$0	0	\$0.0000	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Commercial A/C & Heat Pump Program																							
- Air Conditioner Replacement	3	3	\$651.67	\$1,655	63	189	\$0.07458	\$14	\$0	\$63	\$0	\$63	\$0	\$63	\$0	\$14	\$63	\$0	\$63	\$0	\$63	\$0	\$1,762
- Heat Pump Replacement	14	7	\$773.57	\$10,830	297	2,079	\$0.07441	\$155	\$0	\$642	\$0	\$642	\$0	\$155	\$642	\$155	\$642	\$0	\$642	\$0	\$642	\$0	\$11,527
HVAC Diagnostic & Tune-Up																							
- Air Conditioner	5	10	\$241.60	\$1,208	58	560	\$0.07461	\$43	\$0	\$60	\$0	\$60	\$0	\$43	\$60	\$43	\$60	\$0	\$60	\$0	\$60	\$0	\$1,311
- Heat Pump	14	18	\$169.29	\$2,370	174	3,132	\$0.07438	\$233	\$0	\$119	\$0	\$119	\$0	\$233	\$119	\$233	\$119	\$0	\$119	\$0	\$119	\$0	\$2,722
Commercial Load Management (Pilot Program)																							
- Air Conditioner	6	4	\$1,042.17	\$6,253	0	0	\$0.00000	\$0	\$0	0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,253
- Water Heating	6	4	\$1,042.17	\$6,253	0	0	\$0.00000	\$0	\$0	0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,253
Commercial Incentive	108	43	\$6,075.73	\$672,179	4,394	188,942	\$0.07235	\$13,670	\$0	\$43,609	\$0	\$43,609	\$0	\$13,670	\$43,609	\$13,670	\$43,609	\$0	\$43,609	\$0	\$43,609	\$0	\$929,468
TOTAL COMMERCIAL PROGRAMS	156	89		\$800,746		164,922		\$14,115	\$0	\$44,413	\$0	\$44,413	\$0	\$14,115	\$44,413	\$14,115	\$44,413	\$0	\$44,413	\$0	\$44,413	\$0	\$859,276
INDUSTRIAL PROGRAMS (W/Est. Opt-Outs Removed)																							
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	0	\$0	\$0	0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	n/a	0	\$0	\$0	0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	\$0.0000	0	\$0	\$0	0	\$0.0000	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	\$0.0000	0	\$0	\$0	0	\$0.0000	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0	0	\$0	\$0	0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	1	1	451.38	\$1,425,170		3,553,206		\$207,053	\$79,959	\$46,148	\$0	\$46,148	\$0	\$207,053	\$46,148	\$207,053	\$46,148	\$0	\$46,148	\$0	\$46,148	\$0	\$1,755,340

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/07/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

KENTUCKY POWER COMPANY		Exhibit C		
FORECAST OF 2012 KENTUCKY RETAIL ENERGY SALES IN KWH FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SECTORS		PAGE 22 of		22
PROGRAM YR 17 - 2012				
LINE NO.	YEAR	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
1	TOTAL ULTIMATE SALES (KWH) *	1,175,000,000	729,000,000	1,623,600,000
2	LESS NON-METERED **	7,050,000	4,374,000	9,741,600
3	TOTAL ESTIMATED RETAIL KWH SALES	1,167,950,000	724,626,000	1,613,858,400
4	LESS OPT - OUT CUSTOMERS KWH	0	0	0
5	KWH BEFORE LOST REVENUE IMPACTS	1,167,950,000	724,626,000	1,613,858,400
6	LESS LOST REVENUE IMPACTS ***	11,574,691	375,357	0
7	ADJUSTED KWH BY SECTOR	1,156,375,309	724,250,643	1,613,858,400
8	LINE 7/LINE 1	98.4%	99.3%	99.4%
PROGRAM YR 17 (3rd QTR)				
9	TOTAL ULTIMATE SALES (KWH) *	544,500,000	370,600,000	781,600,000
10	LINE 8	98.4%	99.3%	99.4%
11	ADJUSTED KWH BY SECTOR	535,788,000	368,005,800	776,910,400
PROGRAM YR 17 (4th QTR)				
12	TOTAL ULTIMATE SALES (KWH) *	630,500,000	358,400,000	842,000,000
13	LINE 8	98.4%	99.3%	99.4%
14	ADJUSTED KWH BY SECTOR	620,412,000	355,891,200	836,948,000
*	SOURCE: 2012 LOAD FORECAST COMPILED BY AEP CORPORATE PLANNING AND BUDGETING DEPT.			
**	.60% ESTIMATED TO BE NON-METERED (OL) DETERMINED FROM BILLED JURISDICTIONAL TARIFF SUMMARY FOR 12 MOS. ENDED DECEMBER 2009.			
***	LOST REVENUE IMPACTS			
	Page 18A of 20, Column 6 - TOTAL RESIDENTIAL PROGRAMS	5,327,487	62,826	-
	Page 18B of 20, Column 6 - TOTAL RESIDENTIAL PROGRAMS	2,888,920	117,609	-
	Page 18C of 20, Column 6 - TOTAL RESIDENTIAL PROGRAMS	3,358,284	194,922	-
	TOTAL	11,574,691	375,357	-

Response to Sierra Club
 Case 2013-00487
 Item No. 3

Program Year	2013 Participants	Gross Participant Impact ¹	2013 KWH	2013 MWH	2014 Participants	Gross Participant Impact ^{1,2}	2014 KWH	2014 MWH	Reduction Opportunity
Energy Impact without System Loss:									
Commercial Incentive									
Residential Efficient Products	151	22,826	3,446,726	3,447	250	22,826	5,706,500	5,707	2,260
Standard CFL	206765	48	9,986,750	9,987	240000	48	11,592,000	11,592	1,605
Specialty CFL	25378	63	1,588,663	1,589	20000	63	1,252,000	1,252	(337)
LED	115	0	0	0	4500	0	0	0	0
Mobile Home High Efficiency Heat Pump	190	4,874	926,060	926	220	4,874	1,072,280	1,072	146
Mobile Home New Construction	126	2,436	306,936	307	155	2,436	377,580	378	71
High Efficiency Heat Pump									
Targeted Energy Efficiency									
Resistance Heat	174	1,890	328,860	329	165	1,890	311,850	312	(17)
Non Resistance Heat	378	2,739	1,035,342	1,035	430	2,739	1,177,770	1,178	143
All Electric	113	1,962	221,706	222	145	1,962	284,490	284	62
Baseload	17	873	14,841	15	20	873	17,460	17	2
Modified Energy Fitness	1200	892	1,070,400	1,070	2000	892	1,784,000	1,784	714
Community Outreach Compact Fluorescent Lighting	5016	340	1,705,440	1,705	5000	340	1,700,000	1,700	(5)
Energy Education for Students	2230	304	677,920	678	2200	304	668,800	669	(9)
Commercial High Efficiency Heat Pump/Air Conditioning									
Air Conditioning	0	309	0	0	5	309	1,545	2	2
Heat Pump	11	1,460	16,060	16	10	1,460	14,600	15	(1)
Residential and Commercial HVAC Diagnostics and Tune-up	156	607	94,692	95	240	607	145,680	146	51
Residential HVAC Diagnostics and Tune-up	16	898	14,368	14	24	898	21,552	22	8
Commercial HVAC Diagnostics and Tune-up									
TOTAL			21,434,763	21,435			26,128,107	26,128	4,693
Summer Demand Impact without System Loss:									
Commercial Incentive									
Residential Efficient Products	151	5.4	815	0.815	250	5.4	1,350	1.350	0.535
Standard CFL	206765	0.005	1,034	1.034	240000	0.005	1,200	1.200	0.166
Specialty CFL	25378	0.006	152	0.152	20000	0.006	120	0.120	(0.032)
LED	115	0	0	0.000	4500	0	0	0.000	0.000
Mobile Home High Efficiency Heat Pump	190	0.8679	165	0.165	220	0.8679	191	0.191	0.026
Mobile Home New Construction	126	0.659	83	0.083	155	0.659	102	0.102	0.019
High Efficiency Heat Pump									
Resistance Heat	174	-0.197	-34	(0.034)	165	-0.197	-33	(0.033)	0.001
Non Resistance Heat	378	-0.032	-12	(0.012)	430	-0.032	-14	(0.014)	(0.002)
Targeted Energy Efficiency									
All Electric	113	0.28	32	0.032	145	0.28	41	0.041	0.009
Baseload	17	0.22	4	0.004	20	0.22	4	0.004	0.000
Modified Energy Fitness	1200	-0.041	-49	(0.049)	2000	-0.041	-82	(0.082)	(0.033)
Community Outreach Compact Fluorescent Lighting	5016	0.071	356	0.356	5000	0.071	355	0.355	(0.001)
Energy Education for Students	2230	0.074	165	0.165	2200	0.074	163	0.163	(0.002)
Commercial High Efficiency Heat Pump/Air Conditioning									
Air Conditioning	0	0.13	0	0.000	5	0.13	1	0.001	0.001
Heat Pump	11	0.09	1	0.001	10	0.09	1	0.001	0.000

Respon... Sierra Club
 Case 2013-00487
 Item No. 3

Program Year	2013 Participants	Gross Participant Impact ¹	2013	2013	2014 Participants	Gross Participant Impact ^{1,2}	2014	2014	Reduction Opportunity
Residential and Commercial HVAC Diagnostics and Tune-up	156	0.05	8	0.008	240	0.05	12	0.012	0.004
Residential HVAC Diagnostics and Tune-up	16	0.07	1	0.001	24	0.071	2	0.002	0.001
Commercial HVAC Diagnostics and Tune-up				2,720			3,413	3,413	0.693
TOTAL									
Winter Demand Impact without System Loss:									
Commercial Incentive	151	5.4	KW	MW	250	5.4	KW	MW	MW
Residential Efficient Products			815	0.815			1,350	1,350	0.535
Standard CFL	206765	0.005	1,034	1.034	240000	0.005	1,200	1,200	0.166
Specialty CFL	25378	0.006	152	0.152	20000	0.006	120	0.120	(0.032)
LED	115	0	0	0.000	4500	0	0	0.000	0.000
Mobile Home High Efficiency Heat Pump	190	1.434	272	0.272	220	1.434	315	0.315	0.043
Mobile Home New Construction	126	0.146	18	0.018	155	0.146	23	0.023	0.005
High Efficiency Heat Pump									
Resistance Heat	174	0.732	127	0.127	165	0.732	121	0.121	(0.006)
Non Resistance Heat	378	0.952	360	0.360	430	0.952	409	0.409	0.049
Targeted Energy Efficiency									
All Electric	113	0.51	58	0.058	145	0.51	74	0.074	0.016
Baseload	17	0.14	2	0.002	20	0.14	3	0.003	0.001
Modified Energy Fitness	1200	0.329	395	0.395	2000	0.329	658	0.658	0.263
Community Outreach Compact Fluorescent Lighting	5016	0.067	336	0.336	5000	0.067	335	0.335	(0.001)
Energy Education for Students	2230	0.045	100	0.100	2200	0.045	99	0.099	(0.001)
Commercial High Efficiency Heat Pump/Air Conditioning									
Air Conditioning	0	0	0	0.000	5	0	0	0.000	0.000
Heat Pump	11	0.532	6	0.006	10	0.532	5	0.005	(0.001)
Residential and Commercial HVAC Diagnostics and Tune-up	156	0.20	31	0.031	240	0.203	49	0.049	0.018
Residential HVAC Diagnostics and Tune-up	16	0.30	5	0.005	24	0.302	7	0.007	0.002
Commercial HVAC Diagnostics and Tune-up				3,713			4,768	4,768	1.055
TOTAL									

1. Gross participant impact savings are based on 2011 and 2012 Program Evaluation Reports (i.e. Case 2011-00300 and Case 2012-00367)
 2. The 2014 gross participant impacts will be updated following approval of evaluation report to be filed August 15, 2014.



KENTUCKY
POWER

A unit of American Electric Power

RECEIVED

AUG 15 2011

PUBLIC SERVICE
COMMISSION

Kentucky Power
101A Enterprise Drive
P O Box 5190
Frankfort, KY 40602-5190
KentuckyPower.com

Jeff R. Derouen, Executive Director
Kentucky Public Service Commission
P. O. Box 615
211 Sower Boulevard
Frankfort, KY 40602

August 15, 2011

Dear Mr. Derouen:

Re: Case No. 2011-_____

In the Matter of the Joint Application Pursuant to 1994 House Bill No. 501 for the Approval of Kentucky Power Company Collaborative Demand-Side Management Programs, and for Authority to Implement a Tariff to Recover Costs, Net Lost Revenues and Receive Incentives associated with the Implementation of the Kentucky Power Company Collaborative Demand-Side Management Programs.

Pursuant to the Commission's Order dated May 22, 1996, enclosed are an original and ten copies of the Joint Applicants' status report. This report describes the operation and progress of the Demand-Side Management Plan.

The Joint Applicants seek authority for Kentucky Power Company or KPCo, in conjunction with its utility services and pursuant to the 1994 House Bill No. 501, to implement the enclosed revised electric tariff to recover costs associated with the implementation of demand-side management programs, which include net lost revenues and incentives related to those programs.

The DSM Collaborative is requesting Commission approval to significantly decrease annual participation levels for the following programs. The actual participant levels for the first half of 2011 were lower than expected. As a result, a decrease in annual participants based on a revised projection for the last half of the year was prudent.

- o Small Commercial AC HP Program from 120 to 65 participants per year.
- o Residential & Commercial Load Management Program from 1,040 to 550 participants per year.

August 15, 2011
Jeff R. Derouen

Page 2 of 3

In this filing, the DSM Collaborative is requesting Commission approval for a three-year extension of Kentucky Power's Targeted Energy Efficiency, Community Outreach CFL, Energy Education for Students, Mobile Home Heat Pump, Mobile Home New Construction, and High Efficiency Heat Pump programs through 2014. Evaluation reports for the first two years of the previous three-year extension (2009-2010) have been provided to justify the continuation of the programs.

The DSM Collaborative is also requesting Commission approval in this filing, for a two-year extension of the Kentucky Power Modified Energy Fitness Program. A program evaluation report is recommended for development beginning January 1st through June 30th, 2013, based on the program operation for years 2011 and 2012. The evaluation reports for the first two years of the previous three-year extension (2009-2010) have been provided to justify the continuation of the program.

The DSM collaborative recommends 2012 Evaluation, Measurement, and Verification, or EM&V, services for 5 DSM programs to be provided by an external vendor. The EM&V services will begin October 2011 with the evaluation report to be developed through June 30, 2012. The evaluation reports will be filed with the August 15, 2012 filing for the following 5 programs; Residential Efficient Products, Commercial High Efficiency Heat Pump/Air Conditioner, Residential and Commercial HVAC Diagnostic and Tune-up, Commercial Incentive, and Residential and Commercial Load Management programs.

The revised DSM Adjustment clause factor for the residential sector has been agreed upon and is proposed by the DSM Collaborative (see Exhibit C, Column 4, Line 13). The proposed factor for the residential sector is the midpoint between the ceiling and the floor calculations as demonstrated on Exhibit C. The floor was calculated by taking the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4 Line 2) and dividing by the adjusted estimated sector KWH sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 11). The ceiling was calculated by taking the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 4) and dividing by the adjusted estimated sector KWH sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 11).

The revised DSM Adjustment clause factor for the commercial sector has been agreed upon and is proposed by the DSM Collaborative (see Exhibit C, Column 4, Line 26). The proposed factor for the commercial sector is the midpoint between the ceiling and the floor calculations as demonstrated on Exhibit C. The floor was calculated by taking the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 16) and dividing by the adjusted estimated sector KWH sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 24). The ceiling was calculated by taking the Collaborative projected remaining fourth quarter position (see Exhibit C, Column 4, Line 18) and dividing by the adjusted estimated sector KWH sales for the remaining fourth quarter (see Exhibit C, Column 4, Line 24).

August 15, 2011
Jeff R. Derouen

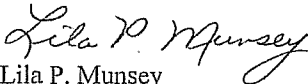
Page 3 of 3

The Joint Applicants request the Commission to approve the following:

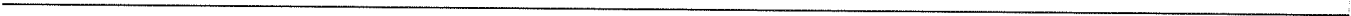
- (1) A three-year extension of the Targeted Energy Efficiency, Community Outreach CFL, Energy Education for Students, Mobile Home Heat Pump, Mobile Home New Construction, and High Efficiency Heat Pump programs.
- (2) A two-year extension of the Modified Energy Fitness program.
- (3) The reduced participant levels for the Residential & Commercial Load Management Program and Small Commercial AC HP Program.
- (4) The DSM Electric Tariff to become effective September 28, 2011.
~~This will allow the Company to utilize the new residential and commercial factors with the first billing cycle in October 2011.~~

As is customary, the Company requests the Commission return a stamped copy of the revised tariff sheet upon arrival. If you have any questions, please contact me at (502) 696-7010.

Sincerely,


Lila P. Munsey
Manager, Regulatory Services

enclosure



KENTUCKY POWER COMPANY
Demand Side Management
Status Report
 As of June 30, 2011

INDEX

PAGE	DESCRIPTION
1	Definitions
2	Summary Information (All Programs)
3	Summary Energy/Demand Information (All Programs)

DSM Programs:

Residential Programs

4	Targeted Energy Efficiency
5	High Efficiency Heat Pump - Mobile Home
6	Mobile Home New Construction
7	Modified Energy Fitness Program
8	High Efficiency Heat Pump
9	Community Outreach Compact Fluorescent Lamp (CFL)
10	Energy Education for Students
11	Residential HVAC Diagnostic and Tune-up
12	Residential Load Management
13	Residential Efficient Products
14	Energy Fitness - Inactive
15	Compact Fluorescent Bulb - Inactive
16	High Efficiency Heat Pump Retrofit - Inactive

Commercial Programs

17	Commercial HVAC Diagnostic and Tune-up
18	Commercial Load Management
19	High Efficiency Heat Pump/Air Conditioner
20	Commercial Incentive
21	Smart Audit - Inactive
22	Smart Incentive - Inactive

Industrial Programs

23	Smart Audit - Inactive
24	Smart Incentive - Inactive

DEFINITIONS

- 1) YTD Costs - Year-to-Date costs recorded through June 30, 2011.
- 2) YTD Impacts - Estimated in place load impacts for Year-to-Date participants.
- 3) PTD Costs - Costs recorded from the inception of the program through June 30, 2011
- 4) PTD Impacts - Estimated in place load impacts for Program-to-Date participants.

COMMENTS

Our calculations are based on actual participants and costs as of June 30, 2011. The Residential DSM costs in this status report do not agree with the total costs in the Financial Report due to a one month lag in reporting.

The estimated actual in-place energy (kWh) savings is the summation of the monthly average net energy savings associated with participating customers of each DSM program (including T&D losses). The average monthly net energy savings is the product of 1/12 of the annual kWh per participant (shown in Exhibit E) and 1/2 of the new participants for the current month, plus the cumulative participants from the previous months. The average monthly net energy savings is then increased by 10% to include T&D losses. The estimated actual in-place energy (kWh) savings are calculated in accordance with the Sunset Provision contained in the joint application, filed September 27, 1995.

The estimated anticipated peak demand (kW) reduction is a product of the number of net participating customers (excluding free riders) and projected winter/summer demand reductions filed for each program (refer to Section III to V of the joint application). The anticipated peak demand (kW) reductions includes 11% T&D loss savings.

The calculation of YTD and PTD estimated in place energy (kWh) savings and anticipated peak demand (kW) reductions contained in this status report reflect, wherever applicable, the program evaluation results of each individual program as described in the August 16, 1999, June 30, 2002, June 30, 2005, June 30, 2008, June 30, 2010, and August 15, 2011 DSM collaborative report.

The individual DSM lost revenue, efficiency incentive and maximizing incentives as of June 30, 1997 are calculated based on the initial values from Exhibit E in the joint application, filed September 27, 1995. A retroactive adjustment of the initial values of the efficiency incentives and net lost revenue KWH impacts was used for each program for the first eighteen months (1/1/96 to 6/30/97). The lost revenue, efficiency incentive and maximizing incentive for the period 1/1/2011 to 12/31/2011 are calculated using the revised values contained in Schedule C of this status report.

The program lost revenue is the product of the number of participating customers, the average net energy savings (kWh) per customer and the net lost revenue (\$/kWh). The number of participating customers is equal to 1/2 of the new participants for the current month, plus the cumulative participants from the previous months. The program-to-date lost revenues are calculated in accordance with the Sunset Provision contained in the joint application, filed September 27, 1995.

The efficiency incentive is the product of the number of participants for the month and the efficiency rate (\$/participant). The maximizing incentive is calculated as 5% of actual program cost for the month.

**KENTUCKY POWER COMPANY
 SUMMARY INFORMATION (ALL PROGRAMS)**

As of June 30, 2011

DESCRIPTION	YTD	PTD
Total Revenue Collected	<u>\$2,159,716</u>	<u>\$19,104,829</u>
Total Program Costs	788,106	12,600,290
Total Lost Revenues	258,694	4,375,063
Total Efficiency / Maximizing Incentive	<u>137,200</u>	<u>1,485,904</u>
HEAP - Kentucky Power's Information Technology Implementation Costs (Case No 2006 - 00373, Dated December 14, 2006)	0	58,968
HEAP - KACA's Information Technology Implementation Costs	<u>0</u>	<u>15,700</u>
Total DSM Costs As of June 30, 2011	<u>\$1,184,009</u>	<u>\$18,535,925</u>

KENTUCKY POWER COMPANY
SUMMARY INFORMATION (ALL PROGRAMS)
 As of June 30, 2011

DESCRIPTION	YTD		PTD	
Actual In-Place Energy Savings:	3,098,615	kWh	637,549,877	kWh
w/ T&D Line Losses:	3,408,477	kWh	701,304,865	kWh
<hr/>				
Total kW Reductions:				
Winter	805	kW	23,616	kW
w/ T&D Line Losses:	893	kW	26,214	kW
Summer	1,150	kW	6,246	kW
w/ T&D Line Losses:	1,276	kW	6,933	kW

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Targeted Energy Fitness
PARTICIPANT DEFINITION:	Number of Households
CUSTOMER SECTOR:	Residential - Low Income
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	All Electric	Non All Electric
Jan	13	2
Feb	24	0
Mar	21	1
Apr	15	1
May	14	2
Jun	23	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	110	6
PTD	3,180	1,056

Impacts	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	221,796	100,016,701
Anticipated Peak Demand (kW) Reduction:		
Summer	36	686
Winter	63	2,986

Costs	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	6,922.00	0.00	260,249.00
Equipment/Vendor:	70,042.00	0.00	3,242,317.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	9,553.00
Total Program Costs	76,964.00	0.00	3,512,119.00
Lost Revenues:	54,465.00	1,944.00	737,287.00
Efficiency Incentive:	16,253.00	184.00	99,902.00
Maximizing Incentive:	42.00	0.00	123,239.00
Total Costs	147,724.00	2,128.00	4,472,547.00

COMMENTS:

The Targeted Energy Efficiency Program provides a variety of services, including a home energy audit, weatherization and seal-up to targeted low income customers.

The Equipment / Vendor cost categories includes the cost of labor and materials of measures installed, participant energy education costs and vendor administration costs. The YTD costs are \$76,123 for all-electric and \$841 for non-all-electric homes.

The YTD Estimated in Place Energy (kWh) Savings for all-electric participants and non-all-electric participants is 215,376 and 6,420 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for all-electric and non-all-electric participants is 34/62 and 1/1 respectively.

The YTD Lost Revenue for all-electric participants and non-all-electric participants is \$49,111 and \$5,354 respectively.

The YTD Efficiency Incentive for all-electric participants is \$16,253.
 The YTD Maximizing Incentive for non-all-electric participants is \$42.

The projected participant and budgetary level for 2011 is 350 all-electric homes, 55 non-all-electric homes and \$400,000.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	High Efficiency Heat Pump - Mobile Home
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	19
Feb	10
Mar	9
Apr	18
May	27
Jun	11
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	94
PTD	2,374

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	144,760	97,870,349
Anticipated Peak Demand (kW) Reduction:		
Summer	48	381
Winter	79	3,997

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	5,748.00	0.00	52,122.00
Equipment/Vendor:	4,650.00	0.00	70,155.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	36,800.00	0.00	1,014,000.00
Other Costs:	0.00	0.00	1,167.00
Total Program Costs	47,198.00	0.00	1,137,444.00
Lost Revenues:	35,657.00	5,820.00	515,159.00
Efficiency Incentive:	27,615.00	16,331.00	213,023.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	110,470.00	24,151.00	1,865,626.00

COMMENTS:

The High Efficiency Heat Pump - Mobile Home program provides incentives to customers, encouraging them to install the highest efficiency equipment practical.

The projected participant and budgetary level for 2011 is 230 and \$113,500 respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Mobile Home New Construction
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	Heat Pump	Air Conditioner
	Jan	17
Feb	2	0
Mar	18	0
Apr	12	0
May	12	0
Jun	7	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	68	0
PTD	2,213	2

Impacts	Year-To-Date	Program-To-Date
	Estimated in Place Energy (kWh) Savings	123,209
Anticipated Peak Demand (kW) Reduction:		
Summer	34	637
Winter	18	5,105

Costs	Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
		Total Evaluation	6,150.00	0.00
Equipment/Vendor:	3,600.00	0.00	133,563.00	
Promotional:	0.00	0.00	3,939.00	
Customer Incentives:	36,500.00	0.00	1,117,950.00	
Other Costs:	0.00	0.00	4,616.00	
Total Program Costs	46,250.00	0.00	1,296,512.00	
Lost Revenues:	26,205.00	0.00	574,587.00	
Efficiency Incentive:	6,393.00	0.00	164,170.00	
Maximizing Incentive:	0.00	0.00	2,580.00	
Total Costs	78,848.00	0.00	2,037,849.00	

COMMENTS:

The Collaborative has devised and implemented a plan in conjunction with trade allies to offer a financial incentive to new mobile home buyers and trade allies to encourage the installation of high efficiency heat pumps and upgraded insulation packages in new mobile homes.

The revised projected participant and budgetary level for 2011 is 205 heat pumps and \$123,000 respectively

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Modified Energy Fitness
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	88
Feb	88
Mar	120
Apr	101
May	120
Jun	128
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	645
PTD	7,635

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	476,786	97,445,347
Anticipated Peak Demand (kW) Reduction:		
Summer	-21	1,037
Winter	172	4,240

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	4,393.00	0.00	31,499.00
Equipment/Vendor:	197,564.00	0.00	2,739,342.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	21,547.00	0.00	21,547.00
Total Program Costs	223,504.00	0.00	2,792,388.00
Lost Revenues:	49,469.00	0.00	709,136.00
Efficiency Incentive:	9,456.00	0.00	299,990.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	282,429.00	0.00	3,801,514.00

COMMENTS:

The Modified Energy Fitness program provides energy audits, blower door testing, duct sealing and direct installation of low cost conservation measures to residential customers with electric space heating and electric water heating.

The equipment / vendor cost category includes the cost of labor and materials of measures installed, the cost of promotion by the vendor and vendor administration costs including customer education.

The projected participants for 2011 is 1,211 at a budgeted expense of \$455,000.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	High Efficiency Heat Pumps
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	<u>Resistance</u>	<u>Non Resistance</u>
Jan	28	53
Feb	24	20
Mar	26	20
Apr	18	17
May	28	47
Jun	30	55
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	154	212
PTD	497	938

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	356,815	4,582,224
Anticipated Peak Demand (kW) Reduction:		
Summer	29	209
Winter	228	1,690

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	11,849.00	0.00	11,849.00
Equipment/Vendor:	16,850.00	0.00	95,400.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	132,000.00	0.00	532,100.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	160,699.00	0.00	639,349.00
Lost Revenues:	45,993.00	0.00	108,411.00
Efficiency Incentive:	37,063.00	0.00	201,052.00
Maximizing Incentive:	0.00	0.00	17,177.00
Total Costs	243,755.00	0.00	965,989.00

COMMENTS:

This program was implemented to reduce residential electric consumption by replacing older, less efficient electric heating systems with high efficiency heat pumps. Customers are provided an incentive encouraging them to promote the highest efficiency equipment practical.

The YTD Estimated in Place Energy (kWh) Savings for resistance heat replacement and non-resistance heat replacement participants is 190,307 and 166,508, respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for resistance heat replacement and non-resistance heat replacement participants is 0/89 and 0/139 respectively.

The YTD Lost Revenue for resistance heat replacement and non-resistance heat replacement participants is \$13,725 and \$32,268 respectively.

The Efficiency Incentive for resistance heat replacement participants is \$12,030 and for the non-resistance heat replacement participants is \$25,033.

The projected participants and budgeted expense for 2011 is 272 resistance heat replacement customers, 500 non-resistance heat replacement customers and \$363,300 respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Community Outreach Compact Fluorescent Lamp
PARTICIPANT DEFINITION:	Number of Customers
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	0
Feb	29
Mar	252
Apr	234
May	1,187
Jun	816
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	2,518
PTD	11,073

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	79,670	888,711
Anticipated Peak Demand (kW) Reduction:		
Summer	145	155
Winter	137	355

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	9,605.00	0.00	18,411.00
Equipment/Vendor	40,154.00	0.00	107,358.00
Promotional:	420.00	0.00	13,966.00
Administration:	0.00	0.00	1,699.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	50,179.00	0.00	141,432.00
Lost Revenues:	15,695.00	0.00	62,652.00
Efficiency Incentive:	9,871.00	0.00	52,561.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	75,745.00	0.00	256,645.00

COMMENTS:

The Community Outreach Compact Fluorescent Lighting (CFL) program is designed to educate and influence residential customers to purchase and use compact fluorescent lighting in their homes. A package of 4 high efficiency CFLs are distributed to customers at scheduled community outreach events.

The projected participant and budgetary level for 2011 is 4,800 customers and \$60,500, respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Energy Education For Students
PARTICIPANT DEFINITION:	Number of Students
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	237
Feb	81
Mar	163
Apr	0
May	457
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	938
PTD	3,615

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	59,194	348,016
Anticipated Peak Demand (kW) Reduction:		
Summer	56	59
Winter	34	103

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	6,081.00	0.00	10,260.00
Equipment/Vendor:	5,554.00	0.00	34,757.00
Promotional:	0.00	0.00	0.00
Education Workshops	0.00	0.00	10,000.00
Administration	0.00	0.00	4,562.00
Total Program Costs	11,635.00	0.00	59,579.00
Lost Revenues:	5,579.00	0.00	17,084.00
Efficiency Incentive:	1,513.00	0.00	14,944.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	18,827.00	0.00	91,607.00

COMMENTS:

The Energy Education for Students program is designed to partner with the National Energy Education Development Project (NEED) to implement an energy education program for 7th grade students at participating middle schools. The students will be provided a package of four 23 watt CFLs to install in their homes. The program will influence residential customers to purchase and use compact fluorescent lighting in their homes.

The projected participant and budgetary level for 2011 is 2,000 students and \$31,000.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Residential HVAC Diagnostic and Tune-up
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants			
		Heat Pump	Air Conditioner
Jan		13	0
Feb		12	0
Mar		72	13
Apr		98	13
May		50	14
Jun		45	24
Jul		0	0
Aug		0	0
Sep		0	0
Oct		0	0
Nov		0	0
Dec		0	0
YTD		290	64
PTD		318	64

Impacts			
		Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings		175,909	175,909
Anticipated Peak Demand (kW) Reduction:			
Summer		70	70
Winter		66	66

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	0.00
Equipment/Vendor:	12,050.00	0.00	13,500.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	12,100.00	0.00	13,500.00
Administration:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	24,150.00	0.00	27,000.00
Lost Revenues:	3,326.00	1,944.00	3,390.00
Efficiency Incentive:	3,384.00	184.00	3,703.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	30,860.00	2,128.00	34,093.00

COMMENTS:

The Residential HVAC Diagnostic and Tune-up Program provides incentives to customers for a variety of HVAC services including over and under refrigerant charge and other diagnostic performance checks on residential unitary central air conditioning and heat pump units.

The projected participant and revised budgetary level for 2011 is 180 central air conditioners and 400 heat pumps at a budgeted program expense of \$63,760.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Residential Load Management
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants		
	A/C Switches	Water Heater SW
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	0	0

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	0.00
Equipment/Vendor:	0.00	0.00	0.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	0.00	0.00	0.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	0.00	0.00	0.00

COMMENTS:

The Residential Load Management Program will determine whether peak demand can be effectively reduced through the installation of load control devices on central air conditioners, heat pumps, and/or electric water heaters.

The projected participant and budgetary level for 2011 is 250 air conditioners or heat pumps and 250 water heating switches at \$260,650 respectively. The vendor contract was effective on June 1, 2011 with program participants targeted for remainder of year.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Residential Efficient Products
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	CFL	Specialty Bulbs	LED Lights
Jan	0	0	0
Feb	0	0	0
Mar	3,299	0	0
Apr	23,439	0	0
May	29,148	0	0
Jun	21,878	0	0
Jul	0	0	0
Aug	0	0	0
Sep	0	0	0
Oct	0	0	0
Nov	0	0	0
Dec	0	0	0
YTD	77,764	0	0
PTD	77,764	0	0

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	1,734,741	1,734,741
Anticipated Peak Demand (kW) Reduction:		
Summer	863	863
Winter	86	86

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	0.00
Equipment/Vendor:	41,694.00	0.00	41,694.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	100,383.00	0.00	100,383.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	142,077.00	0.00	142,077.00
Lost Revenues:	20,573.00	0.00	20,573.00
Efficiency Incentive:	24,107.00	0.00	24,107.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	186,757.00	0.00	186,757.00

COMMENTS:

The Residential Efficient Products Program will provide incentives and marketing support through retailers to build market share and usage of ENERGY STAR lighting products. Designed to produce long-term energy savings in the residential sector by increasing the market share of ENERGY STAR CFLs and (or) other ENERGY STAR lighting products

The projected levels for 2011 is 135,945 ENERGY STAR CFLs and 800 other lighting products
 The budgeted expense for 2011 \$387,876

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Energy Fitness - Inactive
PARTICIPANT DEFINITION:	Number of Households
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	2,812

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	0	65,360,221
Anticipated Peak Demand (kW) Reduction:		
Summer	0	441
Winter	0	1,932

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	18,189.00
Equipment/Vendor:	0.00	0.00	665,964.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	960.00
Total Program Costs	0.00	0.00	685,113.00
Lost Revenues:	0.00	(19,322.00)	363,029.00
Efficiency Incentive:	0.00	(46,349.00)	63,482.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	0.00	(65,671.00)	1,111,624.00

COMMENTS:

This program was discontinued May 14, 1999.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Compact Fluorescent Bulb - Inactive
PARTICIPANT DEFINITION:	Number of Bulbs Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	269

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	0	280,416
Anticipated Peak Demand (kW) Reduction:		
Summer	0	3
Winter	0	3

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	60.00
Equipment/Vendor:	0.00	0.00	15,021.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	0.00	0.00	15,081.00
Lost Revenues:	0.00	25.00	1,605.00
Efficiency Incentive:	0.00	8.00	433.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	0.00	33.00	17,119.00

COMMENTS:

This program was discontinued December 31, 1996

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	High Efficiency Heat Pumps Retro - Inactive
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants			
	Resistance	Non Resistance	
Jan	0	0	
Feb	0	0	
Mar	0	0	
Apr	0	0	
May	0	0	
Jun	0	0	
Jul	0	0	
Aug	0	0	
Sep	0	0	
Oct	0	0	
Nov	0	0	
Dec	0	0	
YTD	0	0	
PTD	1,367	929	

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	0	71,026,985
Anticipated Peak Demand (kW) Reduction:		
Summer	0	851
Winter	0	2,995

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	12,885.00
Equipment/Vendor:	0.00	0.00	129,767.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	70,500.00
Other Costs:	0.00	0.00	1,160.00
Total Program Costs	0.00	0.00	214,312.00
Lost Revenues:	0.00	(269.00)	368,960.00
Efficiency Incentive:	0.00	(2,196.00)	48,017.00
Maximizing Incentive:	0.00	0.00	5.00
Total Costs	0.00	(2,465.00)	631,294.00

COMMENTS:

This program was discontinued December 31, 2001.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Commercial HVAC Diagnostic and Tune-up
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants			
	Heat Pump	Air Conditioner	
Jan	0	0	
Feb	0	0	
Mar	6	0	
Apr	3	0	
May	6	0	
Jun	3	1	
Jul	0	0	
Aug	0	0	
Sep	0	0	
Oct	0	0	
Nov	0	0	
Dec	0	0	
YTD	18	1	
PTD	19	1	

Impacts			
	Year-To-Date	Program-To-Date	
Estimated in Place Energy (kWh) Savings	22,481	22,481	
Anticipated Peak Demand (kW) Reduction:			
Summer	10	10	
Winter	7	7	

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	0.00
Equipment/Vendor:	500.00	0.00	550.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	800.00	0.00	875.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	1,300.00	0.00	1,425.00
Lost Revenues:	424.00	0.00	424.00
Efficiency Incentive:	539.00	0.00	569.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	2,263.00	0.00	2,418.00

COMMENTS:

The Commercial HVAC Diagnostic and Tune-up Program provides a variety of HVAC services, including diagnostic performance checks on commercial unitary central air conditioning and heat pump units.

The Equipment / Vendor cost includes the cost of incentives for participating HVAC dealers promotion of the program. The customer incentives are \$75 per program participant. YTD cost for the program are \$0 for central air conditioning and \$1,300 for heat pump.

The projected participant and budgetary level for 2011 is 60 central air conditioners and 40 heat pumps and \$24,120 respectively.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Commercial Load Management
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	Heat Pump	Air Conditioner
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	0	0

Impacts	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

Costs	Description	Year-To-Date	Retroactive	Program-To-Date
			Adjustment	
	Total Evaluation	0.00	0.00	0.00
	Equipment/Vendor:	0.00	0.00	0.00
	Promotional:	0.00	0.00	0.00
	Customer Incentives:	0.00	0.00	0.00
	Other Costs:	0.00	0.00	0.00
	Total Program Costs	0.00	0.00	0.00
	Lost Revenues:	0.00	0.00	0.00
	Efficiency Incentive:	0.00	0.00	0.00
	Maximizing Incentive:	0.00	0.00	0.00
	Total Costs	0.00	0.00	0.00

COMMENTS:

The Commercial Load Management Program will determine whether peak demand can be effectively reduced through the installation of load control devices on central air conditioners, heat pumps, and/or electric water heaters.

The projected participant and budgetary level for 2011 is 25 A/C and 25 water heating switches and \$28,976 respectively. The vendor contract was effective on June 1, 2011 with program participants targeted for remainder of year.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Commercial High Efficiency HP/AC
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	Heat Pump	Air Conditioner
	Jan	0
Feb	0	0
Mar	0	0
Apr	5	0
May	6	1
Jun	4	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	15	1
PTD	15	1

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	13,116	13,116
Anticipated Peak Demand (kW) Reduction:		
Summer	6	6
Winter	3	3

Costs			
Description	Year-To-Date	Retroactive	
		Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	0.00
Equipment/Vendor:	600.00	0.00	600.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	3,550.00	0.00	3,550.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	4,150.00	0.00	4,150.00
Lost Revenues:			
Efficiency Incentive:	1,308.00	0.00	1,308.00
Maximizing Incentive:	873.00	0.00	873.00
Total Costs	6,331.00	0.00	6,331.00

COMMENTS:

The Commercial High Efficiency Heat Pump/Air Conditioner program offers financial incentive to small commercial customers (< 100 kW demand) who upgrade to a new qualifying central air conditioner or heat pump with a Consortium for Energy Efficiency (CEE) rating. Applicable for 5 ton units or less

The Equipment / Vendor cost includes incentive payments for participating HVAC dealers. Customer incentives are included with the program and a promotional expense of \$12,000 is included with the 2011 budget with newspaper advertisement beginning in July

The projected participant and budgetary level is revised for 2011 to include 25 central air conditioners and an increase to 40 heatpumps with a program budget of \$47,100. The revised budget includes an increase for 2011 evaluation expense from \$2,000 to \$5,305.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Commercial Incentive
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	0

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	0.00
Equipment/Vendor:	0.00	0.00	0.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	0.00	0.00	0.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	0.00	0.00	0.00

COMMENTS:

The Commercial Incentive program offers energy savings for all commercial business customers through promotion of high efficiency electric lighting, HVAC, pumps, and motors. Primary objectives include; increasing the market share and installation rate of high efficiency technologies, and improving the operating efficiencies of existing long life equipment for commercial customers.

The projected participant and budgetary level for 2011 is 88 customers and \$910,560. The vendor contract was effective February 1, 2011 and the program is continuing to acquire new customers with program energy savings to be recorded following verification of customer installed projects

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Smart Audit - Commercial - Inactive
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants			
	Class I	Class II	
Jan	0	0	
Feb	0	0	
Mar	0	0	
Apr	0	0	
May	0	0	
Jun	0	0	
Jul	0	0	
Aug	0	0	
Sep	0	0	
Oct	0	0	
Nov	0	0	
Dec	0	0	
YTD	0	0	
PTD	1,952	194	

Impacts		
	Year-To-Date	Program-To-Date
Estimated In Place Energy (kWh) Savings	n/a	n/a
Anticipated Peak Demand (kW) Reduction:		
Summer	n/a	n/a
Winter	n/a	n/a

Description	Costs		
	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	30,661.00
Equipment/Vendor:	0.00	0.00	1,268,176.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	(8,156.00)
Total Program Costs	0.00	0.00	1,290,681.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	64,533.00
Total Costs	0.00	0.00	1,355,214.00

COMMENTS:

This program was discontinued December 31, 2002.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Smart Incentive - Commercial - Inactive
PARTICIPANT DEFINITION:	Number of Incentives
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants		
	Existing Building	New Building
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	182	69

Impacts		
	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	0	125,682,085
Anticipated Peak Demand (kW) Reduction:		
Summer	0	1,519
Winter	0	2,640

Costs			
Description	Year-To-Date	Retroactive Adjustment	Program-To-Date
Total Evaluation	0.00	0.00	144,039.00
Equipment/Vendor:	0.00	0.00	21,504.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	399,592.00
Other Costs:	0.00	0.00	691.00
Total Program Costs	0.00	0.00	565,826.00
Lost Revenues:	0.00	442.00	891,458.00
Efficiency Incentive:	0.00	1,078.00	88,039.00
Maximizing Incentive:	0.00	0.00	281.00
Total Costs	0.00	1,520.00	1,545,604.00

COMMENTS:

This program was discontinued December 31, 2002.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Smart Audit - Industrial - Inactive
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Industrial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	Class I	Class II
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	60	4

Impacts	Year-To-Date	Program-To-Date
Estimated in Place Energy (kWh) Savings	n/a	n/a
Anticipated Peak Demand (kW) Reduction:		
Summer	n/a	n/a
Winter	n/a	n/a

Costs	Description	Year-To-Date	Retroactive	Program-To-Date
			Adjustment	
	Total Evaluation	0.00	0.00	5,741.00
	Equipment/Vendor:	0.00	0.00	37,786.00
	Promotional:	0.00	0.00	0.00
	Customer Incentives:	0.00	0.00	0.00
	Other Costs:	0.00	0.00	161.00
	Total Program Costs	0.00	0.00	43,688.00
	Lost Revenues:	0.00	0.00	0.00
	Efficiency Incentive:	0.00	0.00	0.00
	Maximizing Incentive:	0.00	0.00	2,185.00
	Total Costs	0.00	0.00	45,874.00

COMMENTS:

This program was discontinued December 31, 1998.

KENTUCKY POWER COMPANY

PROGRAM INFORMATION	
PROGRAM:	Smart Incentive - Industrial - Inactive
PARTICIPANT DEFINITION:	Number of Incentives
CUSTOMER SECTOR:	Industrial
REPORTING PERIOD:	January 1, 2011 - December 30, 2011

New Participants	<u>General</u>	<u>Compressed Air</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	1	0

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	170,625
Anticipated Peak Demand (kW) Reduction:		
Summer	0	6
Winter	0	6

Costs	<u>Retroactive</u>		
	<u>Year-To-Date</u>	<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	28,385.00
Equipment/Vendor:	0.00	0.00	3,288.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	441.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	0.00	0.00	32,114.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	383.00
Maximizing Incentive:	0.00	0.00	655.00
Total Costs	0.00	0.00	33,152.00

COMMENTS:

This program was discontinued December 31, 1998.

KENTUCKY POWER COMPANY

Canceling 3rd Revised Sheet No. 22-2
2nd Revised Sheet No. 22-2

P.S.C. ELECTRIC NO. 9

TARIFF D.S.M.C.
(DEMAND-SIDE MANAGEMENT ADJUSTMENT CLAUSE) (Cont'd.)

RATE. (Cont'd.)

5. The DSM adjustment shall be filed with the Commission ten (10) days before it is scheduled to go into effect, along with all the necessary supporting data to justify the amount of the adjustments, which shall include data, and information as may be required by the Commission.
6. Copies of all documents required to be filed with the Commission under this regulation shall be open and made available for public inspection at the office of the Public Service Commission pursuant to the provisions of KRS 61.870 to 61.884.
7. The resulting range for each customer sector per KWH during the three-year Experimental Demand-Side Management Plan is as follows:

CUSTOMER SECTOR

	<u>RESIDENTIAL</u> (\$ Per KWH)	<u>COMMERCIAL</u> (\$ Per KWH)	<u>INDUSTRIAL*</u>	
Floor Factor =	0.000108	0.000444	- 0 -	(I) (I
Ceiling Factor =	0.001658	0.002637	- 0 -	(R) (I

8. The DSM Adjustment Clause factor (\$ Per KWH) for each customer sector which fall within the range defined in Item 7 above is as follows:

CUSTOMER SECTOR

	<u>RESIDENTIAL</u>	<u>COMMERCIAL</u>	<u>INDUSTRIAL*</u>	
<u>DSM (c)</u>	561,601	556,333	- 0 -	(R) (F
S (c)	\$ 636,014,500	361,020,800	- 0 -	(R) (F
Adjustment Factor	\$ 0.000883	\$ 0.001541	- 0 -	(I) (I

*The Industrial Sector has been discontinued pursuant to the Commission's Order dated September 28, 1999.

DATE OF ISSUE August 15, 2011 EFFECTIVE DATE Service rendered on or after September 28, 2011

ISSUED BY Lila P. Munsey
LILA P MUNSEY MANAGER REGULATORY SERVICES FRANKFORT, KENTUCKY
 NAME TITLE ADDRESS

Issued by authority of an Order of the Public Service Commission in Case No. 2011-XXXXX dated XXXXXX





Evaluation Report

Kentucky Power Company Targeted Energy Efficiency

Evaluation Report for 2009-2010

July 2011

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	6
Summary	6
Promotional Effectiveness.....	6
Delivery Mechanism	6
Data Tracking.....	7
Free Riders and Spillover	7
Market Potential	7
Customer Satisfaction	8
Impact Evaluation	9
All-Electric Results	9
Non-All-Electric Results	10
Total Results	11
Net to Gross Complications	12
<hr/> Cost Effectiveness Evaluation.....	<hr/> 13
All-Electric Results	15
Non-All-Electric Results	15
Total Results	16
Prospective Analysis	17
Recommendations.....	18
References	19
Appendix – Impact Analysis and Methods.....	20
Impact Methodology	20
Billing Analysis	20
Analysis Results	25
Analysis Graphs.....	26
Control Group Analysis.....	29
Appendix - Engineering Estimates.....	32
Engineering Estimate Methodology	32
Technology Descriptions.....	32
Validation Rules	38
Program Assumptions	38
Appendix – Exhibits.....	39
Exhibit 1 – Fact Sheet.....	39
Exhibit 2 – Data Collection Form Page 1	40
Exhibit 3 – Data Collection Form Page 2	40
Appendix – All-Electric Survey	42
Appendix – Non-All-Electric Survey	45
Appendix – EE/DR Analytics Team Members.....	48
Load Research.....	48
EE and Consumer Programs.....	48
Marketing.....	48

Executive Summary

The Kentucky Power Company (KPC) Targeted Energy Efficiency (TEE) program is designed to improve energy efficiency for low-income customers through energy audits coupled with installation of various energy conservation measures. The program specifically targets electric space heating and electric water heating measures, although other types of savings measures are utilized as well. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. Two iterations of the current and prospective cost-benefit tests were run, one that included the Weatherization Assistance Program (WAP) dollars and one that did not. This was done to account for all expenses incurred for items installed on program participants, regardless of the source of the funds. For 2009 and 2010, the TEE program weatherized the homes of 742 customers, providing 1,307 MWh of net annualized energy savings, 200 kW in summer peak demand reductions, and 328 kW of winter peak demand reductions. The process evaluation concluded that the promotion was effective, but the delivery mechanism could use further evaluation to ensure KPC and WAP funds are being used efficiently. The WAP funds expire on March 31, 2012, so they were not included in the prospective analysis.

Based on the results of the evaluation, the TEE program was determined to be cost-effective for the cost-benefit tests used in the California Standard Practice Manual. The prospective analysis of the program for 2012-2014 also predicts the program will be cost-effective. KPC should work with the Kentucky DSM Collaborative to suggest future utilization.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio (KPC)	Winter Peak Ratio (KPC)	Summer Peak Ratio (KPC+WAP)	Winter Peak Ratio (KPC+WAP)
Program Administrator Cost (PACT)	1.42	1.59	1.42	1.59
Total Resource Cost (TRC)	1.42	1.59	0.63	0.71
Ratepayer Impact Measure (RIM)	0.51	0.58	0.51	0.58
Participant Cost (PCT)	N/A	N/A	N/A	N/A

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	1.95
Total Resource Cost (TRC)	1.95
Ratepayer Impact Measure (RIM)	0.68
Participant Cost (PCT)	N/A

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Kentucky Targeted Energy Efficiency program was developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on December 4, 1995 (Case No. 95-427) to help meet Kentucky Power's goals.

Kentucky Power Company's Program was designed to improve energy efficiency through energy audits coupled with installation of various energy conservation measures. The program specifically targets electric space heating and electric water heating measures, although other types of savings measures are utilized as well. Measures installed in all-electric premises and non-all-electric premises include:

-
- 1) Energy audit and inspection of heating equipment (all households)
 - 2) First-line weatherization (weather-stripping and caulking windows and exterior doors)
 - 3) Blower door analysis with air and duct sealing measures
 - 4) Domestic hot water heater measures (water heater blanket, pipe insulation, and thermostat setback)
 - 5) Attic, floor, and wall insulation
 - 6) Compact fluorescent bulbs
 - 7) Structural repairs that have energy efficiency value; i.e., holes in outside walls, outer doors, windows, and ceilings (\$100 maximum)

To implement this program, Kentucky Power Company utilizes existing not-for-profit agencies that focus on weatherizing low-income households. The major goals of the Targeted Energy Efficiency program are to:

- 1) Reduce energy consumption of electrically heated homes
- 2) Assist and encourage home owners to improve heating, ventilation, and air conditioning (HVAC) efficiency by installing weatherization measures
- 3) Increase customer satisfaction and services
- 4) Reduce Kentucky Power's long-range peak demand.

Process and Market Evaluation

Summary

The Program has been in place for many years, and therefore a detailed review of the basic program processes was deemed unnecessary. Rather, the primary emphasis related to the process and market evaluation was whether the program continues to utilize the time of the KPC in an optimal manner given the cooperation with Community Action Agencies (CAA). The 2011 survey of participants indicated that just over 32% of the all-electric and 38% of the non-all-electric participants would likely have purchased similar energy efficiency measures without the program, but were not treated as free riders due to the nature of a low income weatherization program such as the TEE. The promotion method employed was effective. The delivery mechanism continues to be effective; however the costs incurred indicate operational efficiencies can continue to be incorporated when found. Customer satisfaction was very high.

Promotional Effectiveness

KPC promoted the program solely through an established network of Community Action Agencies. Five (5) agencies are involved with the TEE program, but only three (3) participate actively. Participation results were near KPC's expected goals, so it is assumed the promotional work done by the agencies is effective.

Delivery Mechanism

Community Action agencies are responsible for implementing the TEE program in the customers home. Each agency handled all facets of the installation and provided KPC with customer installation reports once per month. KPC staff entered the information into an Access database for participant tracking, including matching customer account numbers, and logging payments made by both KPC and the CAA. On-site inspections were performed to verify the measures were installed and to maintain a quality control check. KPC staff rated the quality of the relationship with the agencies (on a scale of one-to-five, five being best) a four. The relationship was not rated a five because the goals of the CAA is not always the same as those of KPC, and so some funds are not always spent by the agencies in a manner completely consistent with KPC's goals.

Total costs to implement the program indicate that operational efficiencies can be found. Costs attributable to KPC are within reason for a low income weatherization program; however, costs attributed to government stimulus indicate much of the items they installed did not provide much savings above the items that KPC performed, which reduced the savings per dollar ratio. While the

total costs do not affect KPC ratepayers directly, any improved processes benefit all parties involved. As an example, if a process were improved that saved 5%, that money could be allocated to help weatherize more customers.

Data Tracking

Data collection and tracking could be improved. Participation numbers filed with the Collaborative were much higher than the detail implementation data. Sporadic pieces of data were missing -- such as heating source, blower door results, and heat pump EER -- that are required to produce engineering estimates.

A discrepancy in the participation tracking spreadsheet led to underestimated demand savings by 61% in Collaborative reports, but up-to-date summer and winter demand per participant savings data from the last two evaluations could alleviate this problem. Lower per participant estimates led to underreporting of 2009 summer demand savings by 21 kW and winter demand savings by 103 kW. Demand savings from 2010 were reported correctly.

Free Riders and Spillover

A free rider is a participant who would have installed energy efficiency measures had they not participated in the Program. Spillover refers to additional energy efficiency measures adopted by participants as a result of the program. Free ridership was determined by dividing the total survey responses by the positive responses to the questions "Had you planned on installing any weatherization measures before you heard about the program?" and "Would you have installed weatherization measures if the program was not available?" From the survey responses, 17% of all-electric and 16% of non-all-electric participants indicated they would have installed some measures without the program. However, they were not classified as free riders in this program because the basic premise of the low income program is that the participant cannot afford to install any measures without the program. Free ridership was calculated using the combination of customers that answered in the affirmative to the two questions asking if the customer would have installed measures outside the program, and at that time. No information on possible spillover effects was captured in the survey..

Market Potential

In the current U.S. marketplace, there will always be some economic winners and economic losers. Therefore it is anticipated that there will always be a low income segment to society that can benefit from having measures provided to them that helps with energy efficiency. However, since a large portion of the funds for measure installation were provided through government subsidy, it is expected that participation will be lower the next few years. Setting a goal of weatherizing 200 all-electric and 50 non-all-electric customers in each of the next two years seems reasonable.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was very high, with 85% of the all-electric survey respondents indicating they were very satisfied (39%) or satisfied (46%) with the program. For non-all-electric customers, 88% were either very satisfied (41%) or satisfied (47%). No all-electric respondents were very dissatisfied and only one was dissatisfied. Two (2) non-all-electric respondents were very dissatisfied and one was dissatisfied. From the comments received the source of the dissatisfaction was the recent KPC rate increase and an installer not returning to address a complaint.

Impact Evaluation

The TEE evaluation consisted of a billing analysis coupled with engineering estimates of the implementation data collected by KPC. The billing analysis was used to determine net savings by participant. The engineering estimates were used to develop gross measure savings by participant. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. To effectively capture the change in usage patterns, an evaluation needs both pre- and post-installation billing data. The per-participant billing analysis savings are compared to the per-participant engineering estimates to determine an estimated Net-to-Gross ratio. In theory, the billing analysis results should capture the free ridership and spillover behaviors of participant group. Those results are then compared to the survey results to see if the free ridership and spillover questions asked corroborate the analysis. Further details of the billing analysis and engineering estimates can be found in the appendixes.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. Once a valid set of customers was determined, the next step was to perform a billing analysis and create engineering estimates using the algorithms for installed measures (Appendix – Engineering Estimates) to determine an average per-participant energy, summer peak, and winter peak savings value. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings are in the below table.

2009 and 2010 Average Net Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
All-Electric Per Participant Savings	1,962	0.28	0.51
Non-All-Electric Per Participant Savings	873	0.22	0.14

All-Electric Results

For 2009, KPC had goals of weatherizing 210 all-electric homes and saving KPC customers 427 MWh. The program weatherized 259 all-electric homes, and produced net annualized total program savings of 508 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The summer peak demand reductions were 73 kW, and the winter peak demand reductions were 132 kW. KPC met 123% of the participant target and 119% of the energy target. No goals were provided for summer or winter demand savings.

For 2010, KPC had goals of weatherizing 415 all-electric homes and saving KPC customers 843 MWh. The program weatherized 346 all-electric homes, and produce net annualized total program savings of

679 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The summer peak demand savings were 97 kW, and the winter peak demand reductions were 176 kW. KPC met 83% of the participant target, and 80% of the energy target. No goals were provided for summer or winter demand savings.

For 2009 and 2010 of the TEE program, KPC weatherized 605 all-electric homes, producing net annualized program savings of 1,187 MWh of energy savings, reduction of 169 kW at summer peak and 309 kW at winter peak. KPC met 97% of the participant target and 93% of the energy target. Participation and annual energy savings were below the expected goals due to a large influx of WAP dollars to the CAAs, reducing the need for KPC dollars. The WAP dollars expire March 31, 2012.

Impact Evaluation Results by Year for All-Electric Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	210	259	259	123%
Energy (MWh)	427	526	508	119%
Summer Demand (kW)	-	-	73	-
Winter Demand (kW)	-	-	132	-
2010				
Participants	415	346	346	83%
Energy (MWh)	843	703	679	80%
Summer Demand (kW)	-	-	97	-
Winter Demand (kW)	-	-	176	-
Total				
Participants	625	605	605	97%
Energy (MWh)	1,270	1,229	1,187	93%
Summer Demand (kW)	-	-	169	-
Winter Demand (kW)	-	-	309	-

Non-All-Electric Results

For 2009, KPC had goals of weatherizing 78 non-all-electric homes and saving KPC customers 89 MWh. The program weatherized 83 non-all-electric homes, and produced net annualized total program savings of 72 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The summer peak demand reductions were 18 kW, and the winter peak demand reductions were 12 kW. KPC met 106% of the participant target and 82% of the energy target. No goals were provided for summer or winter demand savings.

For 2010, KPC had goals of weatherizing 78 non-all-electric homes and saving KPC customers 89 MWh. The program weatherized 54 homes, and produced net annualized total program savings of 47 MWh of

energy savings, including transmission and distribution losses, persistence, and free ridership. The summer peak demand reductions were 12 kW, and the winter peak demand reductions were 8 kW. KPC met 69% of the participant target, and 53% of the energy target.

For 2009 and 2010 of the TEE program, KPC weatherized 137 non-all-electric homes, producing net annualized program savings of 120 MWh of energy savings, 30 kW in summer peak reductions, and 19 kW in winter peak reductions. KPC met 88% of the participant target and 68% of the energy target. Again, participation and annual energy savings were below the expected goals due to a large influx of WAP dollars to the CAAs, reducing the need for KPC dollars. The WAP dollars expire March 31, 2012.

Impact Evaluation Results by Year for Non-All-Electric Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	78	83	83	106%
Energy (MWh)	89	94	72	82%
Summer Demand (kW)	-	-	18	-
Winter Demand (kW)	-	-	12	-
2010				
Participants	78	54	54	69%
Energy (MWh)	89	61	47	53%
Summer Demand (kW)	-	-	12	-
Winter Demand (kW)	-	-	8	-
Total				
Participants	156	137	137	88%
Energy (MWh)	177	156	120	68%
Summer Demand (kW)	-	-	30	-
Winter Demand (kW)	-	-	19	-

Total Results

For 2009 and 2010, the TEE program, KPC goals were to weatherize 781 homes and save KPC customers 1,447 MWh. The program weatherized 742 customers, and produced net annualized total program savings of 1,307 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. KPC met 95% of the participant target and 90% of the energy target. No goals were provided for summer or winter demand savings, however summer demand savings were 200 kW and winter demand savings were 328 kW. Participation and annual energy savings were slightly below the expected goals.

Impact Evaluation Results by Year for TEE Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	288	342	342	119%
Energy (MWh)	515	621	581	113%
Summer Demand (kW)	-	-	91	-
Winter Demand (kW)	-	-	144	-
2010				
Participants	493	400	400	81%
Energy (MWh)	932	764	726	78%
Summer Demand (kW)	-	-	109	-
Winter Demand (kW)	-	-	184	-
Total				
Participants	781	742	742	95%
Energy (MWh)	1,447	1,385	1,307	90%
Summer Demand (kW)	-	-	200	-
Winter Demand (kW)	-	-	328	-

Net to Gross Complications

Because the TEE program is implemented in conjunction with community agencies that install more measures beyond what KPC requests, the billing analysis cannot be properly compared to the engineering estimate calculations. For the All-Electric participants, the billing analysis estimated per participant savings of 1,761 kWh and the engineering estimate algorithms calculated a per participant savings of 428 kWh. Because there is less certainty in the engineering estimates than in the billing analysis, the billing analysis is still used for all calculations, but all costs incurred by the community agencies must be accounted for in the cost-benefit analysis, if the costs were used to install items that would generate energy savings.

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects (see References). Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included for recovery purposes, unless new labor was utilized incrementally and specifically for DSM program implementation. For the TEE program, all costs of the implementation of the program are considered for cost-benefit tests, even if KPC did not bear the costs. All Weatherization Assistance Program (WAP) dollars were included to account for the government involvement in the program.

The expenditure goal for 2009 in the Collaborative Report was \$233,430 for 210 all-electric and 78 non-all-electric participants. The total program costs as filed were \$273,480 all listed as Equipment/Vendor costs. The costs were split into vendor admin and incentive costs of \$78,364 and \$195,116 respectively, using \$737 as the average incentive cost. Unrecoverable administrative costs from KPC staff and AEPSC staff were not filed, but included for analysis. \$7,000 was included under administration to account for unrecoverable costs; bringing the total to \$280,480 in actual costs related to the program. The expenditure goal for 2010 in the Collaborative Report was \$448,025 for 415 all-electric and 78 non-all-electric participants. The total filed program costs were \$347,248, all listed as Equipment/Vendor costs. The costs were split into vendor admin and incentive costs of \$89,492 and \$257,756 respectively. To account for unrecoverable admin costs another \$7,000 was included for 2010, bringing the total to \$354,248 in actual costs related to the program. \$25,000 was added in 2011 evaluation costs. WAP expenditures were included to account for the assistance provided to help install measures beyond what KPC performed. For 2009, \$269,624 was included, and for 2010, \$547,648 was added to account for incentive payments for installing extra measures.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analyses attempted to account for all costs related to the program. The following table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	KPC Total	WAP Total	TEE Total
2009	\$7,000	\$78,364	\$195,116	\$-	\$280,480	\$269,624	\$550,104
2010	\$7,000	\$89,492	\$257,756	\$-	\$354,248	\$547,648	\$901,896
2011	\$-	\$-	\$-	\$25,000	\$25,000	\$-	\$25,000

Goals were reported as total amounts respective to the winter peak only, however, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP ~~generation pool that experiences summer peaking conditions~~, and winter to account for KPC's maximum system load that occurs in the winter. Benefit costs tests were performed by All-Electric, Non-All-Electric, and Total participation. Results were near break-even, and unremarkable; which is expected in low-income programs.

All-Electric Results

Program goals for the All-Electric portion of the program were to have a Program Administrator Cost (PACT) ratio of 1.99, a Total Resource Cost (TRC) ratio of 1.99, and a Ratepayer Impact Measure (RIM) ratio of 0.78. The Participant Cost (PCT) ratio is not presented when the participant has no costs out of pocket. Goals were not included for ratios that include WAP dollars, because WAP dollars had never been included in program tests before. It is important to capture all costs related to the program, regardless of whether they were paid by KPC, or whether they had previously been recorded. Results for benefit cost ratios at summer peak are 1.61 for the PACT, 1.61 for the TRC without WAP dollars, 0.64 for the TRC with WAP dollars, and 0.53 for the RIM. Results for benefit cost ratios at winter peak are 1.84 for the PACT, 1.84 for the TRC without WAP dollars, 0.73 for the TRC with WAP dollars, and 0.61 for the RIM.

2009 and 2010 Summer Peak Cost Effectiveness Analysis – All-Electric Only

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.61	\$ 316,132	\$ 831,226	\$ 515,094
Total Resource Cost (TRC)	1.61	\$ 316,132	\$ 831,226	\$ 515,094
Ratepayer Impact Measure (RIM)	0.53	\$ (725,912)	\$ 831,226	\$ 1,557,138
Participant Cost (PCT)	N/A	\$ 1,078,774	\$ 1,078,774	\$ -
TRC with WAP	0.64	\$ (461,112)	\$ 831,226	\$ 1,292,338
PCT with WAP	N/A	\$ 1,822,780	\$ 1,822,780	\$ -

2009 and 2010 Winter Peak Cost Effectiveness Analysis – All-Electric Only

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.84	\$ 432,321	\$ 947,414	\$ 515,094
Total Resource Cost (TRC)	1.84	\$ 432,321	\$ 947,414	\$ 515,094
Ratepayer Impact Measure (RIM)	0.61	\$ (609,724)	\$ 947,414	\$ 1,557,138
Participant Cost (PCT)	N/A	\$ 1,078,774	\$ 1,078,774	\$ -
TRC with WAP	0.73	\$ (344,924)	\$ 947,414	\$ 1,292,338
PCT with WAP	N/A	\$ 1,822,780	\$ 1,822,780	\$ -

Non-All-Electric Results

Program goals for the Non-All-Electric portion of the program were to have a Program Administrator Cost (PACT) ratio of 7.83, a Total Resource Cost (TRC) ratio of 7.83, and a Ratepayer Impact Measure (RIM) ratio of 1.90. The Participant Cost (PCT) ratio is not presented when the participant has no costs out of pocket. Results for benefit cost ratios at summer peak are 0.55 for the PACT, 0.55 for the TRC without WAP dollars, 0.54 for the TRC with WAP dollars, and 0.33 for the RIM. Results for benefit cost ratios at winter peak are 0.50 for the PACT, 0.50 for the TRC without WAP dollars, 0.49 for the TRC with WAP dollars, and 0.31 for the RIM.

2009 and 2010 Summer Peak Cost Effectiveness Analysis – Non-All-Electric Only

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	0.55	\$ (52,467)	\$ 64,190	\$ 116,657
Total Resource Cost (TRC)	0.55	\$ (52,467)	\$ 64,190	\$ 116,657
Ratepayer Impact Measure (RIM)	0.33	\$ (127,880)	\$ 64,190	\$ 192,070
Participant Cost (PCT)	N/A	\$ 60,367	\$ 60,367	\$ -
TRC with WAP	0.54	\$ (54,429)	\$ 64,190	\$ 118,619
PCT with WAP	N/A	\$ 62,201	\$ 62,201	\$ -

2009 and 2010 Winter Peak Cost Effectiveness Analysis – Non-All-Electric Only

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	0.50	\$ (57,979)	\$ 58,677	\$ 116,657
Total Resource Cost (TRC)	0.50	\$ (57,979)	\$ 58,677	\$ 116,657
Ratepayer Impact Measure (RIM)	0.31	\$ (133,392)	\$ 58,677	\$ 192,070
Participant Cost (PCT)	N/A	\$ 60,367	\$ 60,367	\$ -
TRC with WAP	0.49	\$ (59,941)	\$ 58,677	\$ 118,619
PCT with WAP	N/A	\$ 62,201	\$ 62,201	\$ -

Total Results

Total program benefit cost results were cost-effective from Program Administrator, and Total Resource perspectives. Program design did not produce total program ratios, so nothing existed to which to compare.

2009 and 2010 Summer Peak Cost Effectiveness Analysis – All Participants

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.42	\$ 263,665	\$ 895,415	\$ 631,750
Total Resource Cost (TRC)	1.42	\$ 263,665	\$ 895,415	\$ 631,750
Ratepayer Impact Measure (RIM)	0.51	\$ (853,792)	\$ 895,415	\$ 1,749,208
Participant Cost (PCT)	N/A	\$ 1,139,141	\$ 1,139,141	\$ -
TRC with WAP	0.63	\$ (515,541)	\$ 895,415	\$ 1,410,957
PCT with WAP	N/A	\$ 1,884,981	\$ 1,884,981	\$ -

2009 and 2010 Winter Peak Cost Effectiveness Analysis – All Participants

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.59	\$ 374,341	\$ 1,006,092	\$ 631,750
Total Resource Cost (TRC)	1.59	\$ 374,341	\$ 1,006,092	\$ 631,750
Ratepayer Impact Measure (RIM)	0.58	\$ (743,116)	\$ 1,006,092	\$ 1,749,208
Participant Cost (PCT)	N/A	\$ 1,139,141	\$ 1,139,141	\$ -
TRC with WAP	0.71	\$ (404,865)	\$ 1,006,092	\$ 1,410,957
PCT with WAP	N/A	\$ 1,884,981	\$ 1,884,981	\$ -

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, the program will remain cost-effective in future years. Any number of a multitude of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the TEE program, results from the current evaluation were used as the starting point for the cost-benefit analysis. WAP dollars are set to expire on March 31, 2012, so they were not included in the prospective analysis. Due to KPC being a winter peaking utility, only the winter peak cost benefit analysis was run. Free ridership was kept at 0% during the prospective analysis and is not expected to increase, regardless of survey results. In general, low-income programs are treated as having zero free ridership due to not having the money to cover the normal incremental cost. KPC-only results were positive, and based solely on KPC's participation, the program should continue. However, since the program is implemented in cooperation with the CAAs, determination for continuing the program is reserved to KPC staff and the DSM Collaborative.

2012-2014 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.95	\$ 993,214	\$ 2,039,229	\$ 1,046,015
Total Resource Cost (TRC)	1.95	\$ 993,214	\$ 2,039,229	\$ 1,046,015
Ratepayer Impact Measure (RIM)	0.68	\$ (960,280)	\$ 2,039,229	\$ 2,999,508
Participant Cost (PCT)	N/A	\$ 1,898,661	\$ 1,898,661	\$ -

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the TEE program.

- 1) Results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective. It is our recommendation that this program be continued.
- 2) Future costs should be captured in a more organized and delineated manner. Each program should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.
- 3) On-going program management should be handled by KPC staff, including tracking of customer participation and estimating ex-ante savings.
- 4) KPC staff labor time spent on the Program should be captured so that the true total cost of delivering the program can be known.
- 5) A snapback effect analysis should be conducted in the next evaluation to see if the customer's bills stay lower after the measures are installed, or if the customer uses the extra money to live at a higher comfort level.
- 6) KPC should consider adding another employee to help with in-the-field audits and ride-along trips so that current KPC staff can focus on program management.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.
- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual. Ohio TRM – Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.

- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template. Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline. MS Excel Workbook. 20 May 2010.
- VII. AEP Load Research Analysis. Cost/Benefit Evaluation Results Targeted Energy Efficiency Program - Program Period: January 2006 – December 2007. Kentucky Power Company. August, 2008.
- VIII. RLW Analytics, Inc. Kentucky Power Company Targeted Energy Efficiency Program 2006-2007 Load Impact Evaluation Report. June 27, 2008.
- IX. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- X. Mohr, Lawrence B. Impact Analysis For Program Evaluation. 2nd Ed. 1995
- XI. The SAS Institute The EXPAND Procedure.
http://support.sas.com/documentation/cdl/en/etsug/60372/HTML/default/viewer.htm#expand_toc.htm
- XII. DeBoor, Carl (1981), A Practical Guide to Splines, New York: Springer-Verlag.
- XIII. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- XIV. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XV. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix - Impact Analysis and Methods

Impact Methodology

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long-term savings from the specific installations. Only customers that passed certain validation criteria were used for analysis, however, this does not preclude them from being counted towards total program impact savings. All methods used for determining savings produce a set of per participant savings numbers. These numbers are then applied to all customers found in the implementation data, regardless of their usage in the actual analysis.

Billing Analysis

Impact evaluation consists of two stages, interim impact evaluation and full impact evaluation. Engineering estimates are used to develop measure savings without post-consumption data. Implementation data is utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. The full impact evaluation consists of a billing analysis. This analysis utilizes relevant weather data and billing data with the statistical regression models to determine the savings impact of the program. A comparison of customers' bills before and after the implementation of the program is used to determine changes in usage and demand that can be attributed to the program. In order to isolate the effects of the program from unassociated changes in consumption, a Participant Group and a distinct but similar Control Group is compared. The Control Group will not contain program participants, but its customers will be similar in consumption to the program participants. After defining these research groups, billing data is weather-normalized to eliminate any effects due to weather differences before and after program implementation. Finally, regression models will be used to analyze the normalized data and provide savings values.

The first step of the billing analysis is to create a valid participant list from which to analyze. Each customer is checked to ensure that data existed for at least one year pre and post measure installation. Participants were also required to have data for all of 2008 to develop a set of comparison metrics for

drawing the control group. Any customers that did not have the requisite billing data, or were inactive at the time of analysis, were discarded from analysis.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. Participants that do not pass validation are still credited towards total program savings calculations, but are not usable when performing the impact calculations. However, only those participants listed in the implementation data were used for total program savings.

The first phase of validation is determining participants per year based on the implementation data provided by KPC. Each participant is assigned a year based on the date of the first measure installed on site due to energy savings beginning with the installation of the first measure. Because of this, some participants may move from the year they were filed with the Collaborative to a different year based on the implementation data. The Collaborative report for 2009 showed that 259 all-electric and 83 non-all-electric customers participated, however, the implementation data showed 258 all-electric and 90 non-all electric. The 2010 Collaborative report showed 346 all-electric, and 54 non-all-electric customers participated, however, the implementation data showed 273 all-electric and 87 non-all-electric. In total, implementation data for the all-electric customers showed 531 customers, while KPC reported that 605 customers had participated, and data for the non-all-electric customers showed 177 customers, while KPC reported 137 customers had participated. The missing 74 all-electric customers, having not been found in the implementation data, could not be verified to have participated and were not included in total program savings calculations. The increase in 40 customers in non-all-electric customers were added to the total program savings calculations, even though they were not reported in the Collaborative Report.

For 2009, the implementation data provided showed that 258 all-electric and 90 non-all-electric customers participated. Forty-five (45) all-electric and 12 non-all-electric customers were not found in AEP Customer Information System (CIS). In all, 213 all-electric and 78 non-all-electric customers were available for analysis. In 2010, after validation, 24 all-electric and 10 non-all-electric customers were not found in the AEP CIS. This left 249 all-electric and 77 non-all-electric customers available for analysis. In total there were 462 all-electric and 155 non-all-electric customers in the implementation data that were valid for analysis.

After the participant list was created, a set of energy statistics was developed to compare to the control group. For each customer, an annual kWh, summer peak month kWh, and winter peak month kW (formulas below) were calculated using 2008 billing data. KPC summer and winter peaks were pulled from the AEP Load Research system peak data and applied to each customer bill that contained that date, and was used to create a summer and winter monthly demand value.

Formula for determining comparison statistics between participant and control group

$$kWh_{annual} = 365 \times \frac{\sum kWh_per_Bill}{\sum Days_per_Bill} \quad kW_s = 31 \times \frac{kWh_per_Bill_s}{Days_per_Bill_s} \quad kW_w = 31 \times \frac{kWh_per_Bill_w}{Days_per_Bill_w}$$

After participant group selection is complete, the KPC population is validated to provide a list of potential control group customers. The population is usually constrained by one or more of program class (residential, C&I, etc...), building characteristics (single-family, mobile home, etc...), fuel type (all-electric, natural gas, etc...), and income level (HEAP, non-HEAP, all). Customers are removed from consideration if they are not continuously active from January 1, 2008 until current. After the control population has been validated, comparison statistics are calculated using the above formulas.

After the control population group has been established, and both the control population's and participant group's comparison statistics have been calculated, the control population's customers are compared to the participants to provide a baseline comparison. Each participant customer is matched to all control population customers, and the top 50 most accurate matches are kept for further analysis. Matching is determined by calculating an Absolute Relative Deviation (ARD) for the Annual kWh, summer kWh, and winter kWh comparison statistics. The customers with the lowest combined ARD are kept for further validation. For each of the 50 control customers, they are assigned the same installation date as the participant customer. Each of the 50 customers is then validated using the same pre/post rules as the participant customers. Each control customer must have at least one year of data pre and post the pseudo-installation of the measure.

Formula for comparing control population customer to participant

$$ARD = ARD_{kWha} + ARD_{kWhs} + ARD_{kWhw}$$

$$ARD_{kWha} = \frac{|kWha_{ctrl} - kWha_{part}|}{kWha_{ctrl}} \quad ARD_{kWhs} = \frac{|kWhs_{ctrl} - kWhs_{part}|}{kWhs_{ctrl}} \quad ARD_{kWhw} = \frac{|kWhw_{ctrl} - kWhw_{part}|}{kWhw_{ctrl}}$$

After the 50 customers have been compared to the participant, the top 20 are kept for further evaluation. Twenty control groups are used for comparison because of the variance of the population. The population variance is high because the AEP CIS does not contain enough demographic data on the customer to create a very accurate regression model. There are too many lurking variables in a

billing analysis if enough data is not included, which can bias the results. Once the 20 control groups have been selected, each group is run, pairwise, with the participant group through the entire billing analysis process. Final results for each run of the analysis are compared to ensure that none of the control groups are extreme in either direction (load savings or load growth). Using an alpha of .05 for Type I error testing, and a beta of .10 for Type II, or power testing, checks are completed to ensure that the control group methodology is valid. Once the methodology is verified, the first control group, being the most accurate, is used for the regression portion and official savings calculations. If there are concerns about uncertainty, all 20 control groups will be run and the numbers will be aggregated as a replicated analysis.

The regression analysis is conducted by constructing two models, a baseline and treatment weather normalized panel model. A panel analysis is a two-dimensional time-series and cross-sectional model ~~used to evaluate changes in the effects of a treatment on a treatment group compared to a control group over time.~~ Weather Normal, or Typical Meteorological Year, data is created by the U.S. National Renewable Energy Laboratory (NREL) to represent weather data for a typical year. The TMY2 dataset was used for all KPC billing analysis, and is derived from the 1961-1990 National Solar Radiation Data Base (NSRDB).

The baseline model is created using at least one year of billing data pre-installation to develop a weather normalized billing function (see formula below). The treatment model is created using at least one year of billing data post-installation. Each customer is assigned a weather station, average daily temperature, cooling degree day, and heating degree day summaries to each bill. Degree days are calculated by summing the number of hours per day by the degrees per hour above or below a temperature break point. For heating degree days, the breakpoint temperature is set at 65 degrees Fahrenheit. Cooling degree days are calculated using 70 degrees Fahrenheit as the breakpoint. Once the necessary data has been created, an autoregressive model is fit to the data for each customer to create the betas necessary to predict data. Each beta represents the multiplier coefficient for the incremental value of each model variable. To forecast or estimate new kWh, multiply the regression betas by the new data.

Weather normalized regression model

$$kWh = (\beta_{daily_kwh} \times Days) + (\beta_{ADT} \times ADT) + (\beta_{CDD} \times CDD) + (\beta_{HDD} \times HDD) + (\beta_{CDD^2} \times CDD^2) + (\beta_{HDD^2} \times HDD^2) + \epsilon$$

Once the baseline and treatment models have been determined, the model betas are multiplied by weather normal data to create baseline weather normalized bills for each customer. Once the bills have been forecasted, the data is aggregated to create annualized normal energy usage per

customer. Each customer has an estimated baseline and treatment annualized kWh. The difference between the estimated baseline and treatment kWh is the energy savings due to the program. The annualized energy estimates are then summarized by participant group and control group, and multiple t-tests are completed to compare the savings of each group, and their pairwise difference.

Once the annualized savings numbers have been calculated, the forecasted bills are used to create monthly and daily load shapes for DSMore. The monthly load shape is created by temporally disaggregating the bills from a cycle month to a calendar month. Traditional load research techniques use linear interpolation method of determining an average energy usage per day per bill, then creating a stepped daily load shape. This method maintains transformation under integration, meaning one can move from cycle month to billing month without loss of accuracy; however the ability to detect peaks using this method is very limited. The second method, utilized in this evaluation, is to create a daily load shape using cubic splines. This method is also closed under integration, and is the preferred method for temporal disaggregation when using SAS (Statistical Analysis Software®). AEP Load Research has compared the accuracy of both methods in predicting daily load shapes of interval metered customers, and found that the cubic spline disaggregation is more accurate when using goodness-of-fit statistics. However, the primary reason for using cubic splines is the ability to put more load on the peak days of the month. Using the cubic spline method, the forecasted bills are disaggregated to a 365 day daily load shape for each customer. Using the daily load shape, the customers are aggregated using traditional load research methods, to determine a domain load shape. For the TEE program, there are two domains: All-Electric and Non-All-Electric.

Next, the peak day history for KPC is used to create a typical peak day for both the summer and winter peak. This is done by averaging the day per year for each year to determine the average day-per-year. As an example, if the last five winter peaks occurred between January 11th and January 15th, it is expected that the average day-per-year peak day will be January 13th. After the typical peak date for the summer and winter peaks has been determined, the KPC Residential Load Research class load shape, as determined by AEP Load Research, is retrieved for each peak date. Using the Residential class load shape, the proportion of energy used at the peak hour, relative to the total energy for the day is determined as a load factor. To determine the summer and winter peaks, the daily energy from the cubic spline disaggregation is divided by the load factor and 24 (hours per day) to determine the average peak demand reduction for each season. The formula is below:

Peak demand reduction formulas

$$kWs = \frac{kWh_{peakdayS}}{24} \div LF_S \qquad kWw = \frac{kWh_{peakdayW}}{24} \div LF_W$$

Analysis Results

The below graphs contain the summary panel, profile plot, and agreement plot from SAS, created during the PROC TTEST procedure. Particular attention should be paid to the uncertainty of the parameter estimate for the mean. Because of the uncertainty involved in the model, any savings estimate within the Lower Confidence Level (LCL) and Upper Confidence Level (UCL) is within plus or minus two standard errors of the mean. What this means is that the findings of the billing analysis show that the *ex-ante* savings estimate of 2,032 kWh per all-electric participant is not statistically different from the *ex post* savings estimate to the 95% confidence level, and the *ex-ante* savings estimate of 1,136 kWh per non-all-electric participant is not statistically different from the *ex post* savings estimate to the 95% confidence level

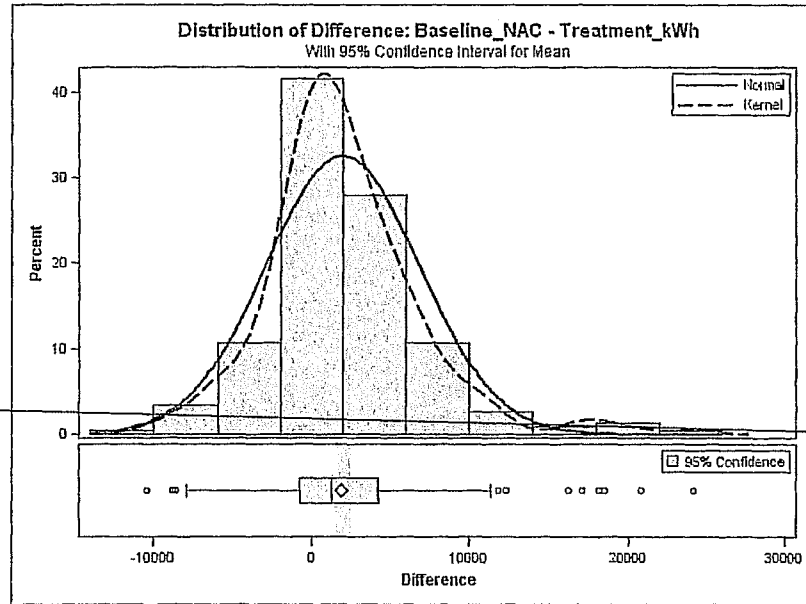
All twenty control groups were ran and aggregated. A cursory glance of the control group baseline and treatment comparisons show extreme variability. Had only one control group been run, the savings for all-electric could have been as low as 1,105 kWh or as high as 1,818 kWh. A single control group run for non-all-electric could have found savings as low as 940 kWh or as high as 1,919 kWh. Running multiple iterations of the billing analysis allows us to take advantage of the Central Limit Theorem and create a better estimate of the per participant savings. Control group variation numbers are presented after the charts and graphics.

Summary Statistics: By Sub Group

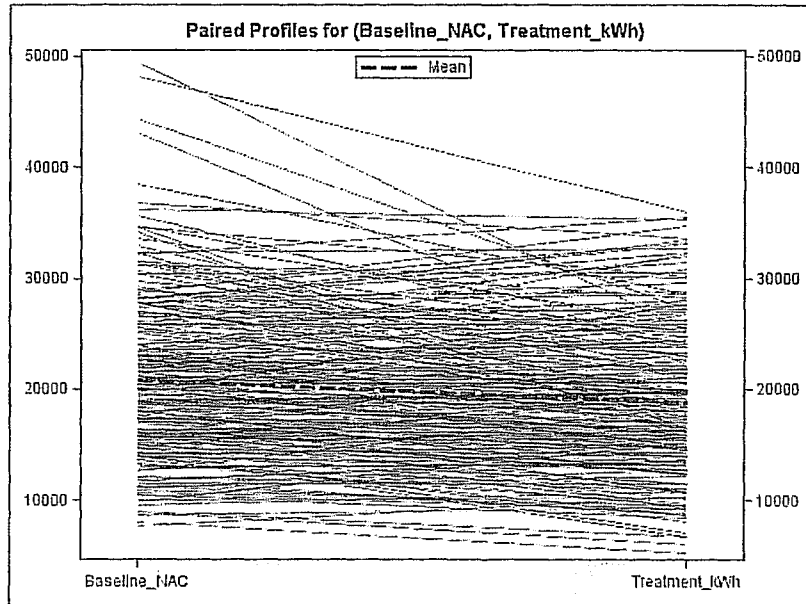
Sub Group	N	Mean	Std Dev	Std Err	95% CL Mean		Summer kW	Winter kW
All-Electric	233	1,962.0	4,899.8	321.0	1,329.5	2,594.4	0.280	0.510
Non-All-Electric	85	873.4	4,658.0	505.2	-131.3	1,871.1	0.220	0.140

Analysis Graphs

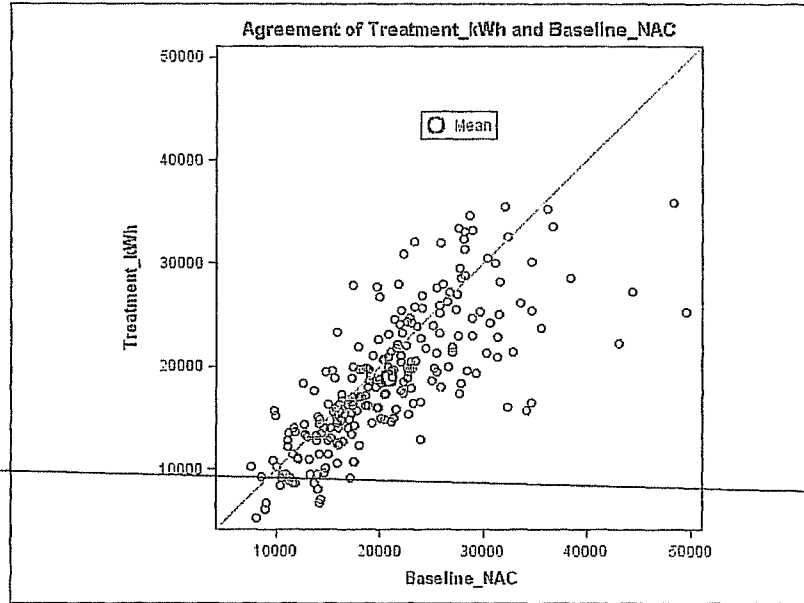
Summary Panel: All-Electric Only



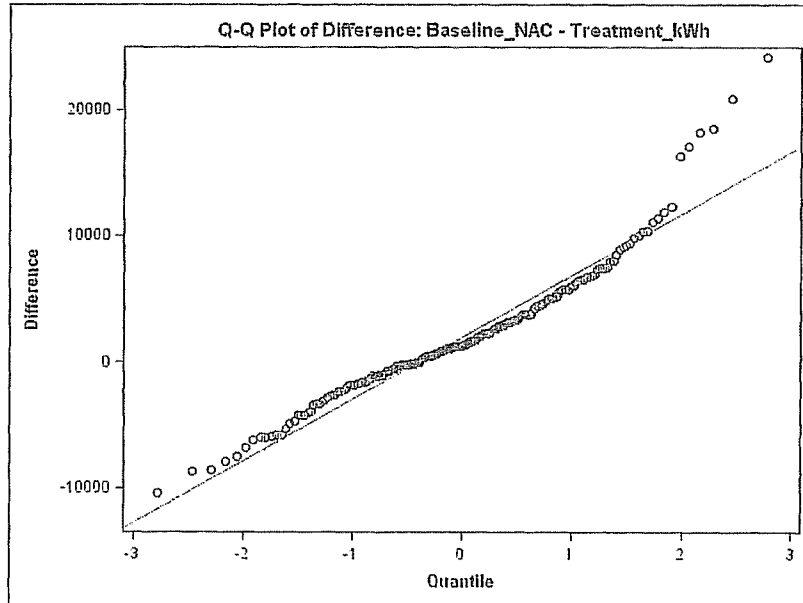
Profile Plot: All-Electric Only



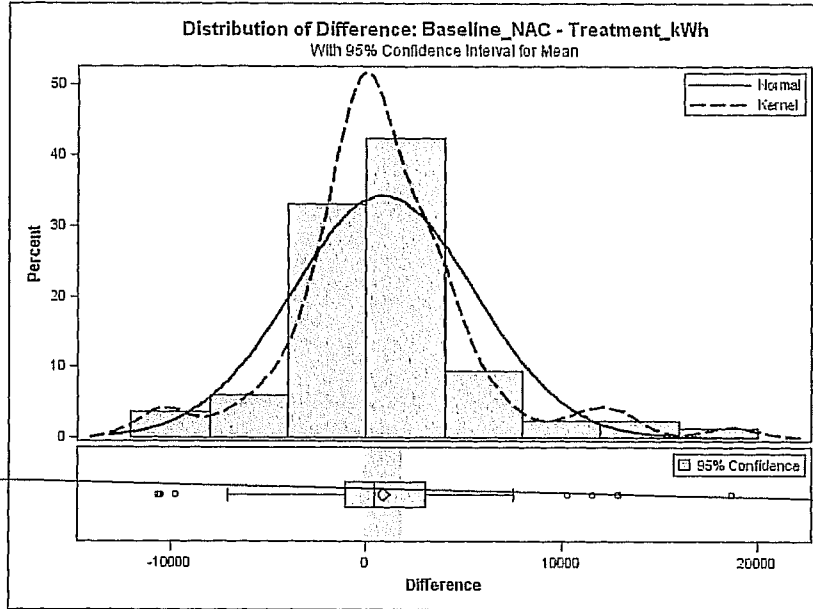
Agreement Plot: All-Electric Only



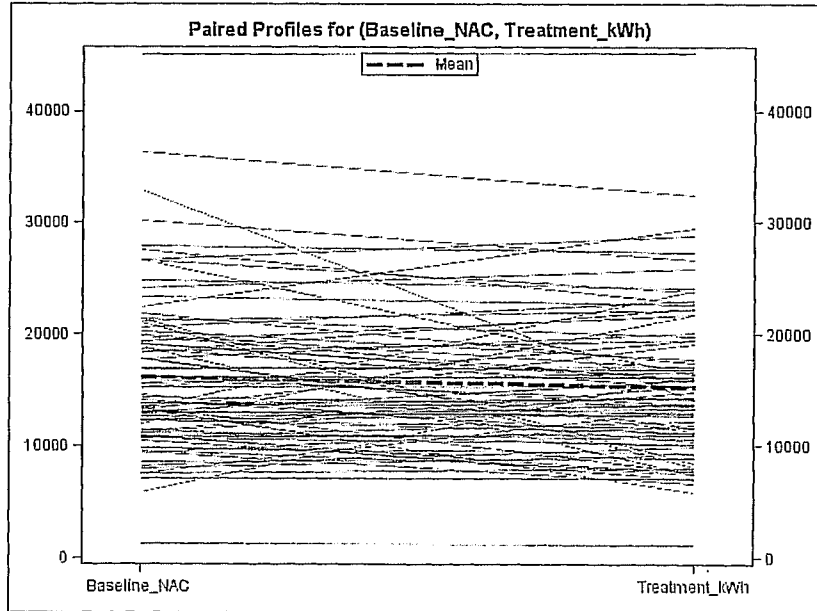
Q-Q Plot: All-Electric Only



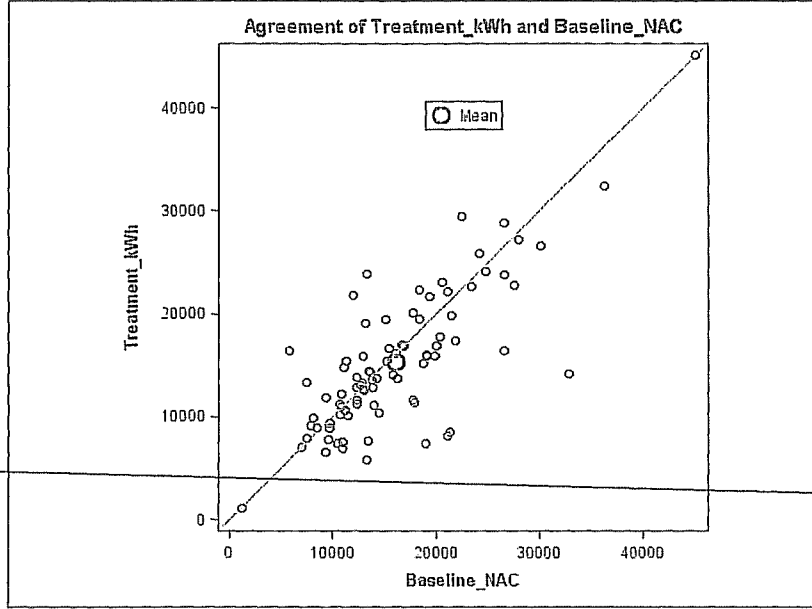
Summary Panel: Non-All-Electric Only



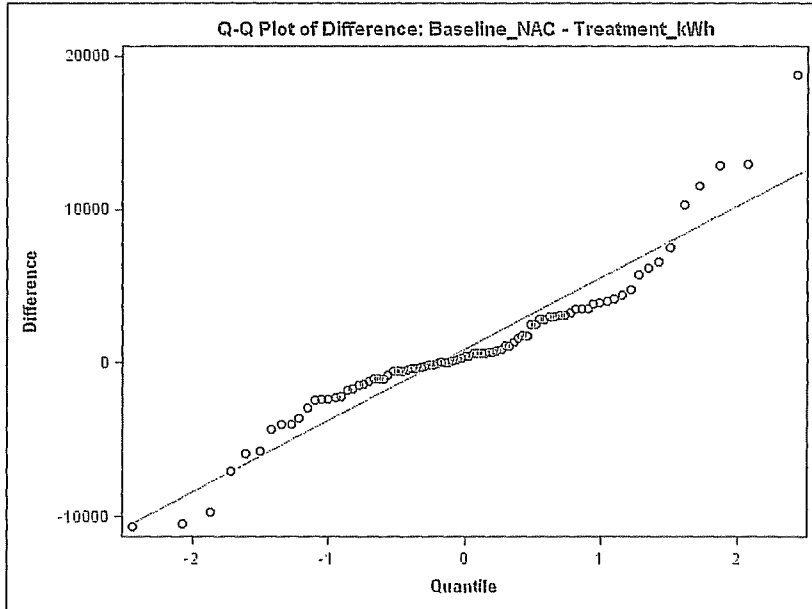
Profile Plot: Non-All-Electric Only



Agreement Plot: Non-All-Electric Only



Q-Q Plot: Non-All-Electric Only



Control Group Analysis

When performing a billing analysis to determine the impacts for program evaluation, the participant group needs to be matched to a set of control customers. For historical analyses, the literature suggests

a single control group be matched to the participant list in order to provide a valid set of customers from which to compare. This is done to remove any activities that are related to free ridership: i.e. those activities that would have occurred without the program. However, this author feels that without a robust set of demographic data to make customers comparisons more accurate than AEP's current CIS contains, a billing analysis must treat the control group selection as a replication of quasi-experimental designs. Quasi-experimental design, or "before and after" design, is distinguished by the non-randomness of the control and participant selection groups. However, given the limited demographic data, we substitute the rigorous selection with an increase in replications. Classical statistics (sometimes called Frequentist statistics) is predicated on the notion of repeated trials to infinity, e.g. the relative frequency of a statistics as the trials near infinity. However, in practice, most statistics that is performed is done using a single trial without replication. In many cases, and disciplines, this is an accepted, even celebrated practice. However, in impact analysis of programs, the usage uncertainty and disparity of customer demographics at a premise (number televisions, HVAC usage, work schedule, occupants, etc....) demands that more than one replication be undertaken. Below is the list of control groups generated for this analysis and how each iteration would have compared to the per participant savings calculated in the billing analysis.

Control Group Comparison to Per Participant kWh – All-Electric Only

Analysis Group	Baseline Mean	Treatment Mean	Ratio	Per Participant kWh if Chosen	Loss/Gain From Mean
Control_01	21,695	20,465	94.3%	1,585	(377)
Control_02	21,152	20,566	97.2%	2,213	251
Control_03	21,214	20,360	96.0%	1,942	(20)
Control_04	21,822	21,141	96.9%	2,138	176
Control_05	21,717	20,666	95.2%	1,765	(197)
Control_06	21,725	20,686	95.2%	1,778	(184)
Control_07	21,828	20,913	95.8%	1,906	(56)
Control_08	21,182	20,924	98.8%	2,549	587
Control_09	21,413	21,251	99.2%	2,648	686
Control_10	21,291	20,342	95.5%	1,848	(114)
Control_11	21,117	20,084	95.1%	1,754	(208)
Control_12	20,745	19,526	94.1%	1,541	(421)
Control_13	21,222	20,763	97.8%	2,344	382
Control_14	20,795	19,817	95.3%	1,795	(167)
Control_15	20,901	20,247	96.9%	2,135	173
Control_16	20,930	19,761	94.4%	1,604	(358)
Control_17	21,249	19,993	94.1%	1,533	(429)
Control_18	21,604	20,871	96.6%	2,078	116
Control_19	21,327	20,536	96.3%	2,010	48
Control_20	21,634	20,886	96.5%	2,064	102

Control Group Comparison to Per Participant kWh – Non-All-Electric Only

Analysis Group	Baseline Mean	Treatment Mean	Ratio	Per Participant kWh if Chosen	Loss/Gain From Mean
Control_01	16,563	17,302	104.5%	2,025	1,151
Control_02	17,436	15,826	90.8%	(246)	(1,119)
Control_03	16,828	15,797	93.9%	270	(604)
Control_04	15,846	15,527	98.0%	952	79
Control_05	15,890	15,502	97.6%	880	7
Control_06	16,639	16,674	100.2%	1,320	447
Control_07	16,136	15,800	97.9%	940	67
Control_08	16,075	16,180	100.7%	1,394	521
Control_09	15,896	16,227	102.1%	1,631	757
Control_10	15,772	15,376	97.5%	870	(4)
Control_11	16,037	15,220	94.9%	440	(433)
Control_12	16,241	15,693	96.6%	725	(148)
Control_13	15,670	15,717	100.3%	1,335	462
Control_14	16,049	15,731	98.0%	957	84
Control_15	16,641	15,388	92.5%	37	(836)
Control_16	16,885	16,456	97.5%	864	(9)
Control_17	16,121	15,810	98.1%	965	92
Control_18	17,029	16,018	94.1%	301	(572)
Control_19	16,385	15,997	97.6%	893	19
Control_20	15,046	14,863	98.8%	1,083	210

Appendix - Engineering Estimates

Engineering Estimate Methodology

To calculate annualized energy savings, an average per-measure savings must be determined based on the heating and cooling savings from the increased efficiency of the heat pump. Heating savings are determined by the inverse difference of the Heating Seasonal Performance Factors (HSPF) between the baseline heat pump and the increased efficiency heat pump. Cooling savings are determined by the inverse difference of the Seasonal Energy Efficiency Rating (SEER) between the baseline and upgraded heat pumps. Each savings value is scaled based on the size of the heat pump by tonnage or British Thermal Unit Hours (BtuH) to determine the per-participant, per-year usage. The per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. This number is compared to the billing analysis values to see if the survey free ridership and spillover questions are comparable to the analytically determined values.

Technology Descriptions

ENERGY STAR CFL Bulbs

Description

A low wattage ENERGY STAR qualified compact fluorescent screw-in bulb (CFL) is purchased through a retail outlet in place of an incandescent screw-in bulb. The incremental cost of the CFL compared to the incandescent light bulb is offset via either rebate coupons or via upstream markdowns. Assumptions are based on a time of sale purchase, not as a retrofit or direct install installation. This characterization assumes that the CFL is installed in a residential location. Where the implementation strategy does not allow for the installation location to be known and absent verifiable evaluation data to support an appropriate residential versus commercial split, it is recommended to use this residential characterization for all purchases to be appropriately conservative in savings assumptions.

Algorithms

$$kWh = \frac{(W_{have} - W_{replace})}{1000} \times (H \times 365) \times (1 + IF)$$

$$kW = \frac{(W_{have} - W_{replace})}{1000} \times CF \times (1 + IF)$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
W_{base}	Wattage of bulb being removed
$W_{replace}$	Wattage of bulb being installed
H	Average Daily hours-of-use
IF	Interactive Factor
CF	Coincidence Factor

Assumptions:

The expected measure life is 8 years.

Air Sealing

Description

This measure characterization is for the improvement of a building's air-barrier, which together with its insulation defines the thermal boundary of the conditioned space. Air-leakage in buildings represents from 5% to 40% of the space conditioning costs but is also very difficult to control. The measure assumes that a trained auditor, contractor or utility staff member is on location, and will measure and record the existing air leakage rate and post air-sealing leakage using a blower door, and the efficiency of the heating and cooling system used in the home.

Algorithms

$$kWh = \frac{\left(\frac{(CFM50_{Exist} - CFM50_{New})}{Nfactor} \times 60 \times CDH \times DUA \times 0.018 \right)}{1000 \times \eta_{Cool}}$$

$$kW = \frac{\Delta kWh}{FLH_{cool}} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
$CFM50_{exist}$	Existing cubic feet per minute at 50 Pascal pressure differential as measured by the blower door before air sealing
$CFM50_{new}$	New cubic feet per minute at 50 Pascal pressure differential as measured by the blower door after air sealing
Nfactor	Conversion factor to convert 50 Pascal air flows to natural airflow

60	Constant to convert cubic feet per minute to cubic feet per hour
CDH	Cooling Degree Hours
DUA	Discretionary Use Adjustment to account for the fact that people do not always operate their air conditioning system when the outside temperature is greater than 75°F
0.018	The volumetric heat capacity of air
η_{Cool}	Efficiency of Air Conditioning equipment
FLH_{cool}	Full load cooling hours
CF	Coincidence Factor

Assumptions

The expected measure life is 15 years.

Attic, Roof, Ceiling Insulation

Description

This measure characterization is for the installation of new additional insulation in the attic/roof/ceiling of a residential building. The measure assumes that an auditor, contractor or utility staff member is on location, and will measure and record the existing and new insulation depth and type (to calculate R-values), the surface area of insulation added, and the efficiency of the heating system used in the home.

Algorithms

$$kWh = \frac{\left(\left(\frac{1}{R_{exist}} - \frac{1}{R_{new}} \right) \times CDH \times DUA \times Area \right)}{1000 \times \eta_{Cool}}$$

$$kW = \frac{\Delta kWh}{FLH_{cool}} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
R_{exist}	Existing effective whole-assembly thermal resistance value or R-value
R_{new}	New total effective whole-assembly thermal resistance value or R-value
CDH	Cooling Degree Hours
DUA	Discretionary Use Adjustment to account for the fact that people do not always operate their air conditioning system when the outside temperature is greater than 75°F
Area	Square footage of insulated area
η_{Cool}	Efficiency of Air Conditioning equipment
FLH_{cool}	Full load cooling hours
CF	Coincidence Factor

Assumptions:

The expected measure life is 8 years.

Duct Sealing

Description

This measure describes evaluating the savings associated with performing duct sealing using mastic sealant or metal tape to the distribution system of homes with either central air conditioning or a ducted heating system.

Algorithms

$$kWh = kWh_{AC} + kWh_{HP} + kWh_{ER}$$

$$kWh_{AC} = \frac{\Delta V_{DL} \times 60 \times CDD_{75°F} \times 24 \times 0.018}{1,000 \times SEER}$$

$$kWh_{HP} = \frac{\Delta V_{DL} \times 60 \times HDD_{60°F} \times 24 \times 0.018}{1,000 \times HSPF}$$

$$kWh_{ER} = \frac{\Delta V_{DL} \times 60 \times HDD_{60°F} \times 24 \times 0.018}{3,413}$$

$$kW = \frac{kWh}{FLH_{cool}} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
CDD	Cooling Degree Days
HDD	Heating Degree Days
SEER	SEER of existing system
HSPF	Heating Season Performance Factor
IF	Interactive Factor
FLH _{cool}	Full Load Cooling Hours
CF	Coincidence Factor

Assumptions:

The expected measure life is 20 years.

Water Heater Wrap

Description

This measure relates to a Tank Wrap or insulation "blanket" that is wrapped around the outside of a hot water tank to reduce stand-by losses. This measure applies only for homes that have an electric water heater that is not already well insulated. Generally this can be determined based upon the appearance of the tank.

Algorithms

$$kWh = kWh_{base} \times \frac{(EF_{new} - EF_{base})}{EF_{new}}$$

$$kW = \frac{\Delta kWh}{8,760}$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
kWh _{base}	Average kWh consumption of electric domestic hot water tank.
EF _{new}	Assumed efficiency of electric tank with tank wrap installed.
EF _{base}	Assumed efficiency of electric tank without tank wrap installed.
8,760	Number of hours in a year.

Assumptions

The expected measure life is 5 years.

Pipe Wrap

Description

This measure describes adding insulation to un-insulated domestic hot water pipes. The measure assumes the pipe wrap is installed to the first length of both the hot and cold pipe up to the first elbow.

Algorithms

$$kWh = \frac{\left(\left(\frac{1}{R_{exist}} - \frac{1}{R_{new}} \right) \times L \times C \times \Delta T \times 8,760 \right)}{\eta_{DHW} \times 3,413}$$

$$kW = \frac{\Delta kWh}{8,760}$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
ISR	In Service Rate or fraction of units that get installed
R_{exist}	Pipe heat loss coefficient of non-insulated pipe (existing)
R_{new}	Pipe heat loss coefficient of insulated pipe (new)
L	Length of pipe from water heating source covered by pipe wrap (ft.)
C	Circumference of pipe (ft.)
ΔT	Average temperature difference between supplied water and outside air temperature (°F)
η_{DHW}	Recovery efficiency of electric hot water heater
3,413	Conversion from Btu to kWh
8,760	Number of hours in a year

Assumptions

The expected measure life is 15 years.

Low Flow Showerhead

Description

This measure relates to the installation of a low flow showerhead in a home. This is a retrofit direct install measure or a new installation. Both electric and fossil fuel savings are provided, although only savings corresponding to the hot water heating fuel should be claimed.

Algorithms

$$kWh = ISR \times (GPM_{base} - GPM_{low}) \times \frac{kWh}{GPM_{reduced}}$$

$$kW = \frac{\Delta kWh}{Hours} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
ISR	In Service Rate or fraction of units that get installed.
GPM _{base}	Gallons per minute of baseline faucet.
GPM _{low}	Gallons per minute of low flow faucet.
kWh/GPM _{reduced}	Assumed kWh savings per GPM reduction.
$\Gamma_{install}$	Rate of install.
$\Gamma_{persist}$	Rate of persistence.
Hours	Average number of hours per year spent using faucet.
CF	Coincidence Factor.

Assumptions

The expected measure life is 15 years.

Validation Rules



Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis (or the end of the measure's expected life).
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Program Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Free Ridership	0%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%

Appendix – Exhibits

Exhibit 1 – Fact Sheet



Program Overview

The Kentucky Power Targeted Energy Efficiency Program provides weatherization and energy efficiency services to qualifying residential customers who need help reducing their energy bills. Kentucky Power provides funding for this program through the Kentucky Community Action network of not-for-profit community action agencies. The program funding is supplemental to the Weatherization Assistance Program offered by your community action agency.


If you're having trouble managing your energy cost, this Kentucky Power funded program can offer assistance. It will provide energy saving improvements to your existing home if you meet the eligibility qualifications. You'll enjoy the long-term benefits of reduced energy cost due to these home energy saving measures.

Program services can include these items, as applicable and per program guidelines:

- Energy audit
- Air infiltration diagnostic test to find air leaks
- Air leakage sealing
- Attic, floor, side-wall insulation
- Dust sealing and insulation
- High efficiency compact fluorescent light bulbs (CFLs)
- Domestic hot water heating insulation (electric)
- Customer education on home energy efficiency

Customer Eligibility

Customers who have primary electric heat and use an average of 700 kWh per month may be eligible for extensive weatherization and energy conservation measures through this program. Customers without primary electric heating may also be eligible for limited efficiency measures if they have electric water heating and use an average of 700 kWh from November through March. To qualify, a household's



income cannot exceed the designated poverty guidelines as administered by your community action agency. To determine if you qualify for this program, please contact the local community action agency in your county of residence.

How to Participate

Find the contact information for your community action agency at kaca.org or by calling 1-800-456-3452. Then, contact your community action agency to determine if you qualify for this energy saving program.

Other Opportunities

Kentucky Power offers a suite of SMART Programs, which are energy efficiency programs for homes, businesses and schools. For more information on this program or other SMART Programs, call 1-800-572-1113 or visit KentuckyPower.com/save.

SMART Programs – Saving Money And Resources TogetherSM




Exhibit 2 - Data Collection Form Page 1

American Electric Power/Kentucky Region
TEL Program: Wx Data Collection Form

Customer Name: _____

Account Holder Name: _____

Electric Company Account Number: _____

Address: _____

Agency: _____

Job Number: _____

Initial Contact Date: ____/____/____

All Work Completed Date: ____/____/____

Phone Number: _____

Housing Type: Site-built Mobile Home Modular Combination

Primary Heat: Electricity Type of Primary System: _____

Secondary Heat: _____ Type of Secondary System: _____

1/4 of heat supplied by electricity: _____ HSPF: _____ (if heat pump)

Air Conditioning (AC)? Yes No Number: Window _____ Central _____ Heat Pump _____

Cooling Capacity 1st AC Unit: _____ Btu SEER or EER 1st Unit: _____ (N/A if missing)

Cooling Capacity 2nd AC Unit: _____ Btu SEER or EER 2nd Unit: _____ (N/A if missing)

of Occupants: _____ # of Conditioned Rooms: _____

Conditioned Volume: _____ ft³ Total Conditioned Floor Area: _____ ft²

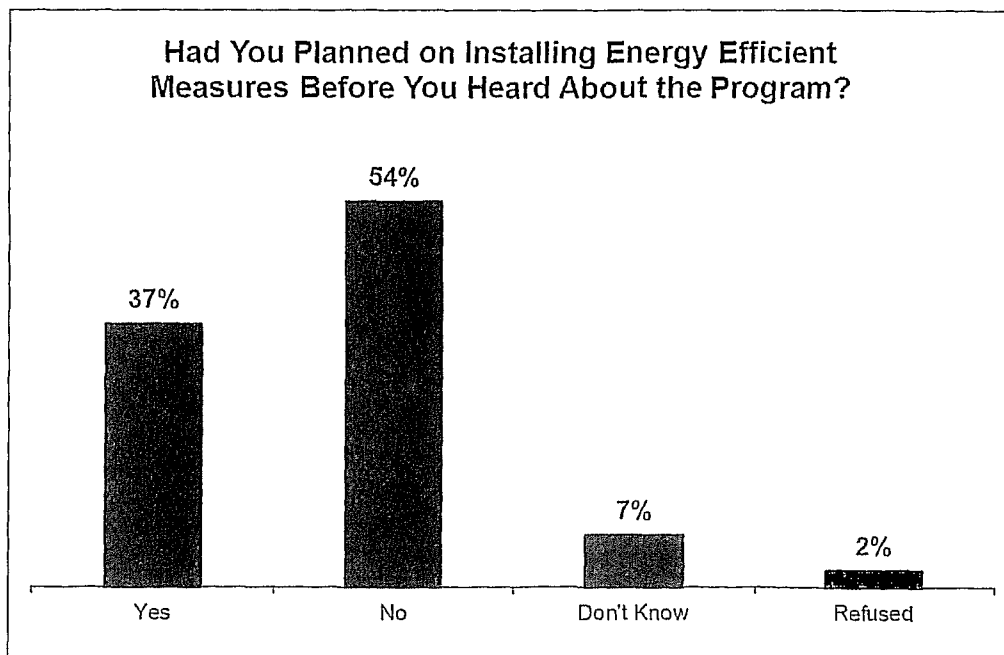
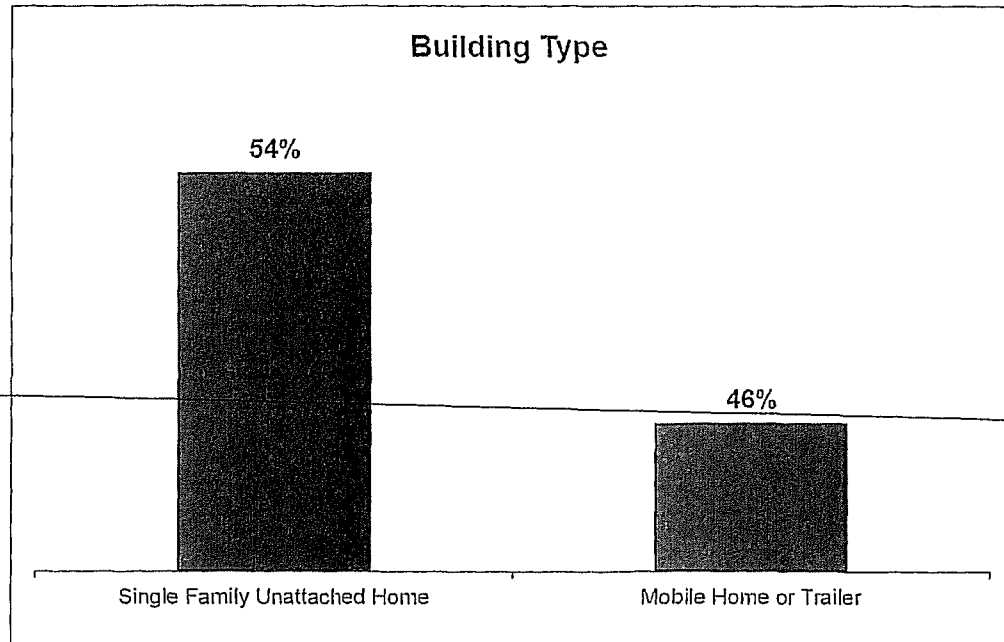
Blower Door Information:	Pre-Weatherization	Post-Weatherization
Shielding: _____ exposed	CFM50 _____	Post Duct Sealing CFM50 _____
_____ average	Blocked Duct CFM 50 _____	Final CFM50 _____
_____ shielded		
# of stories: _____		

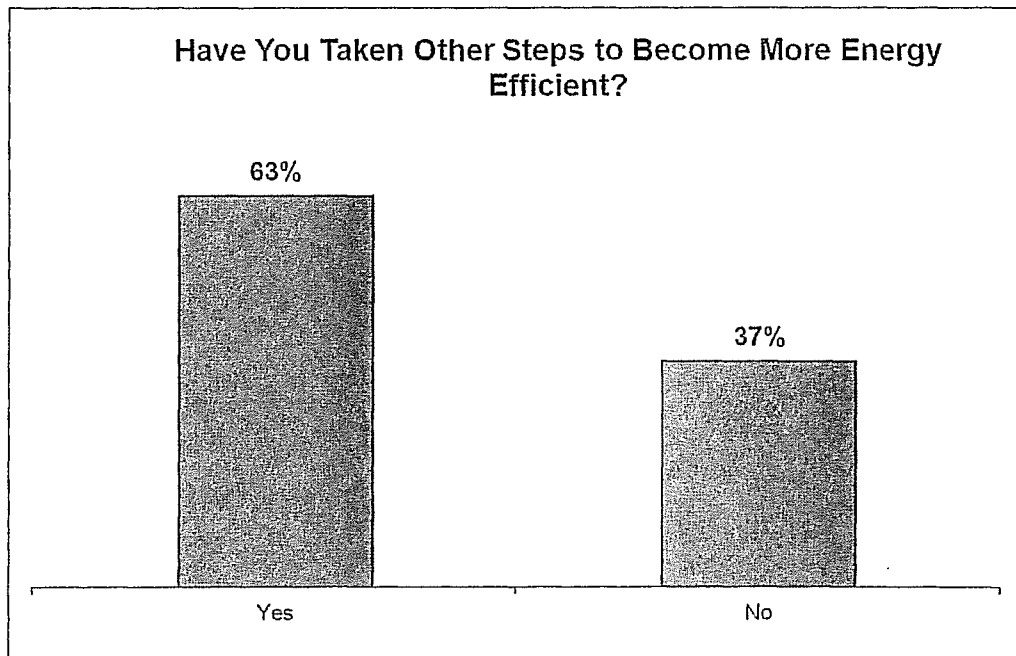
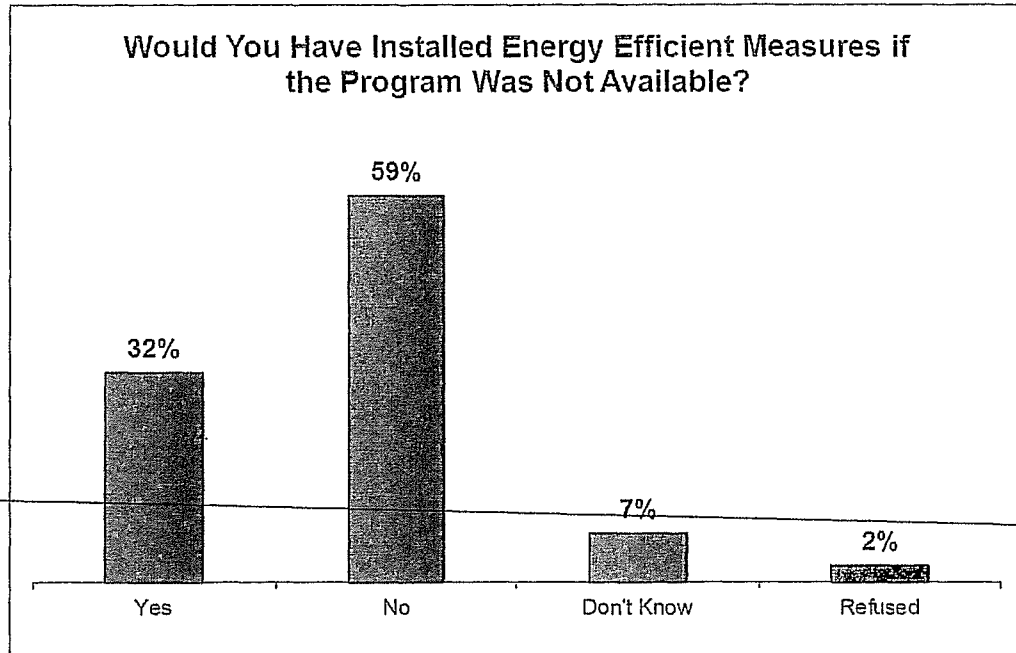
	Yes	No	Cost:	SKPCO	SWAP	Other
Heating Repair work done?						
Filter			Cost:			
Cooling work done?			Cost:			
Filter			Cost:			
Safety work done?			Cost:			
Repair work done?			Cost:			
Air leakage sealing done?			Cost:			
CFM50 reduction attained: _____						
Duct sealing performed?			Cost:			
CFM50 reduction attained: _____						
Attic insulation installed?			Cost:			
Attic 1 area _____ ft ² Pre-R _____ Post-R _____						
Attic 2 area _____ ft ² Pre-R _____ Post-R _____						
Attic 3 area _____ ft ² Pre-R _____ Post-R _____						
Sidewall insulation installed?			Cost:			
Wall 1 Area _____ ft ² Pre-R _____ Post-R _____						
Wall 2 Area _____ ft ² Pre-R _____ Post-R _____						
Floor insulation installed?			Cost:			
Floor 1 area _____ ft ² Pre-R _____ Post-R _____						
Floor 2 area _____ ft ² Pre-R _____ Post-R _____						

Exhibit 3 - Data Collection Form Page 2

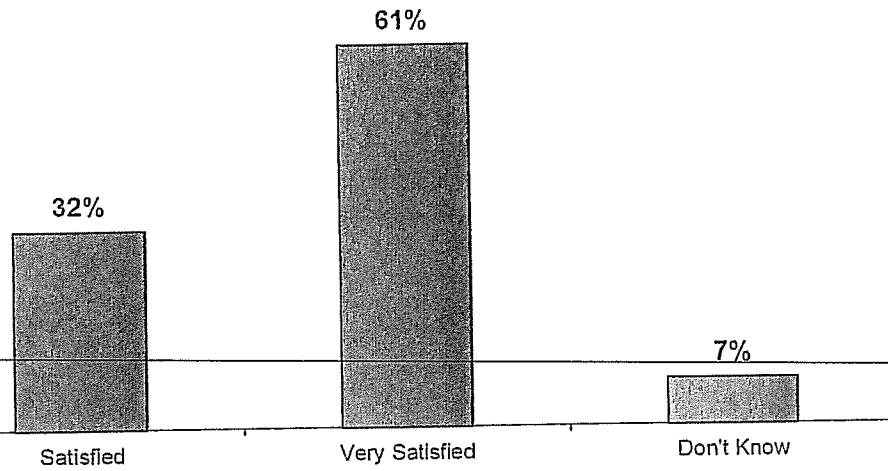
					SKPCO	SWAP	Other
Ducts/Boiler Pipes insulated? Yes No Cost:							
Diameter/ Perimeter	Length	R-installed	Location(s): (U)unconditioned (S)semi-conditioned				
_____	_____	_____	_____				
_____	_____	_____	_____				
Heating system replacement? Yes No Cost:							
Electric Furnace Replacement with Heat Pump							
New Heat Pump Size: _____							
This month Consumer Energy Education Provided? Yes No							
Original day setback: _____ F		Original night setback: _____ F					
New day setback: _____ F		New Night setback: _____ F					
# hours day setback: _____		# hours night setback: _____					
Water bed covers installed? Yes No Cost:							
# installed _____							
Domestic hot water measures performed? Yes No Cost:							
Fuel Type (check one): <input type="checkbox"/> electric <input type="checkbox"/> gas							
Tank capacity: _____ gallons		Tank age: _____ years					
Temperature: original _____		Setback to: _____					
# of feet of pipe insulation installed: _____							
Insulation jacket installed? Yes No							
If NO, reason why? _____							
Number of low-flow shower head(s) installed: _____							
Compact Fluorescent bulb(s) installed? Yes No Cost:							
Wattage of bulb #1 installed: _____		Hours of Use: _____					
Wattage of bulb #1 replaced: _____		Location of bulb #1: _____					
Wattage of bulb #2 installed: _____		Hours of Use: _____					
Wattage of bulb #2 replaced: _____		Location of bulb #2: _____					
Wattage of bulb #3 installed: _____		Hours of Use: _____					
Wattage of bulb #3 replaced: _____		Location of bulb #3: PORCH					
Consumer Energy Education provided? Yes No Cost:					\$80.00		
TEE Administrative Fee:					\$175.00		
DOE Weatherization Overhead, Support and DNR Costs							
TOTAL COSTS FOR EACH COLUMN:							

Appendix - All-Electric Survey

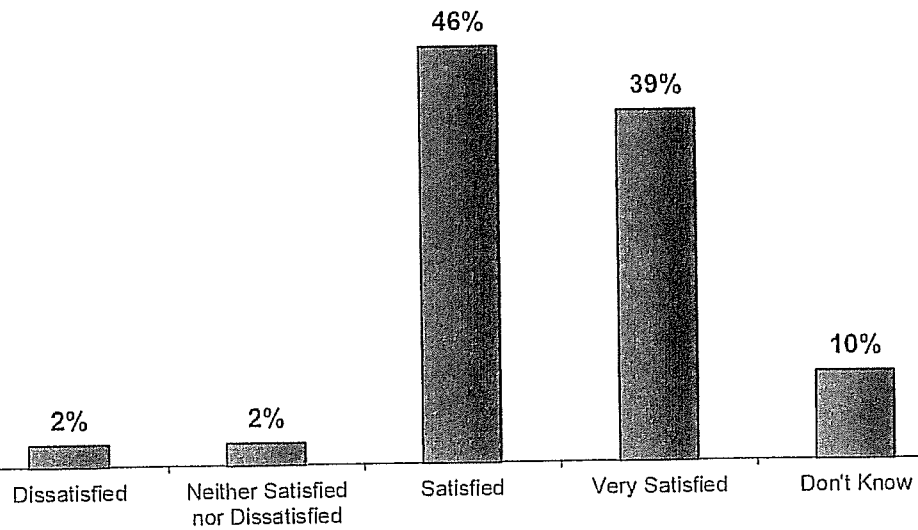




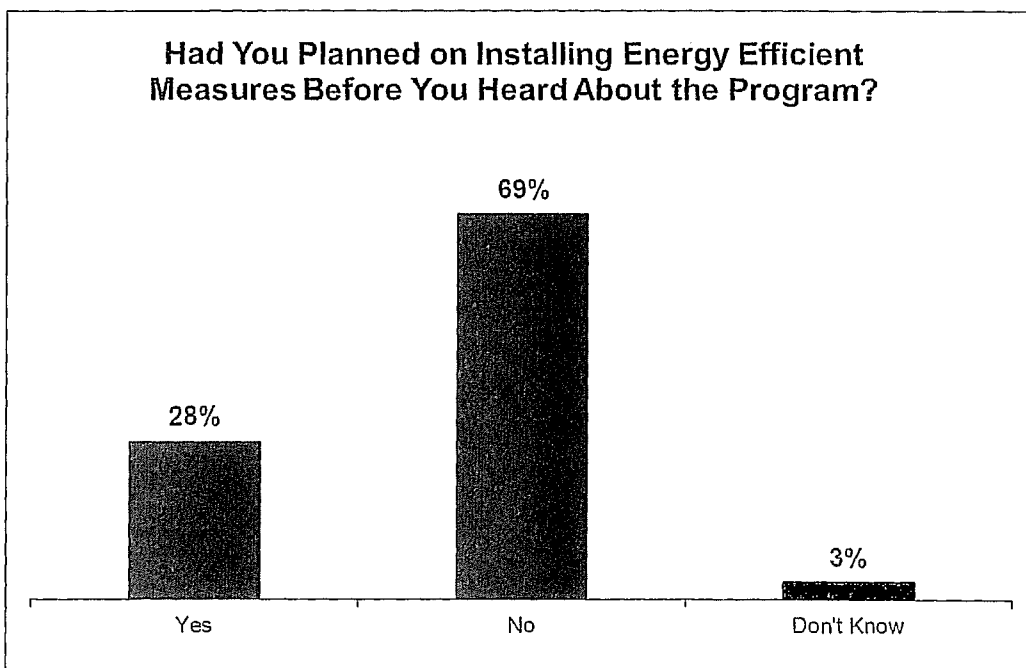
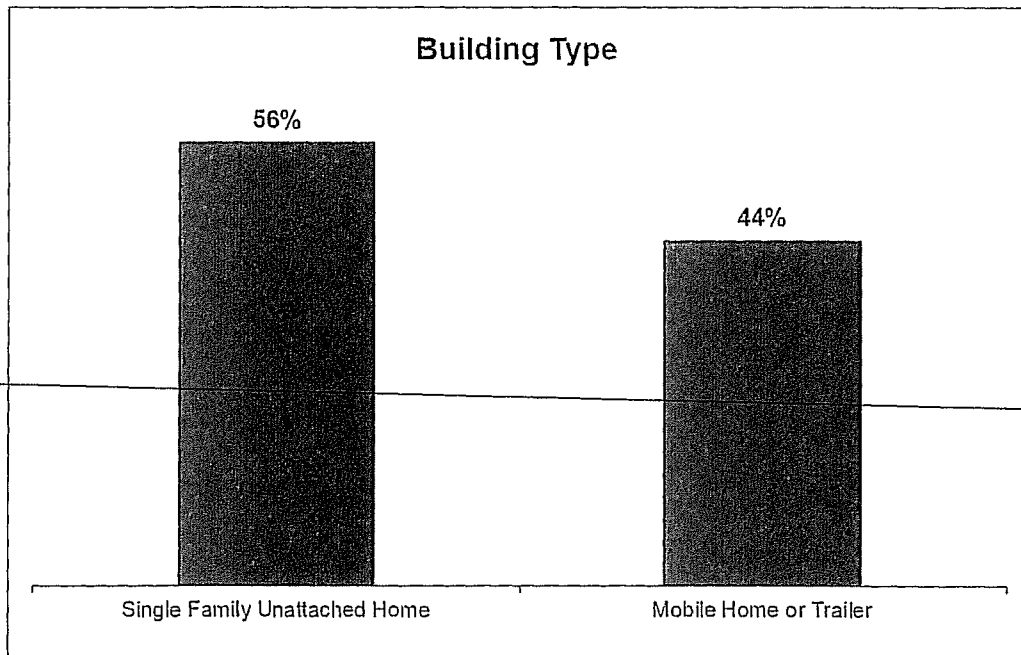
How Satisfied are You with the Dealer that Installed Your Energy Efficient Measures?

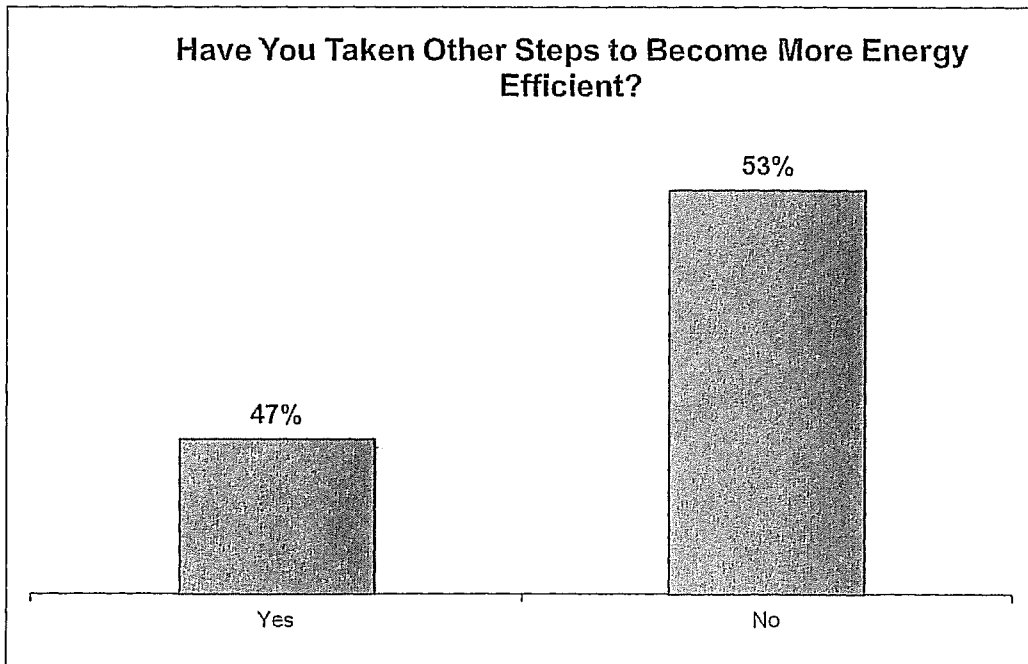
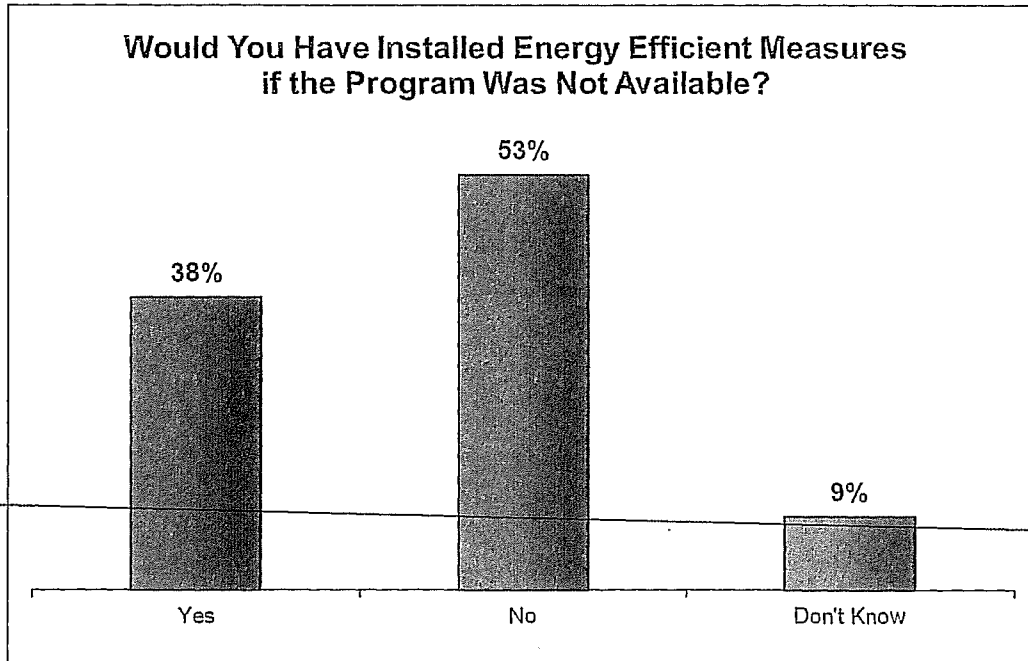


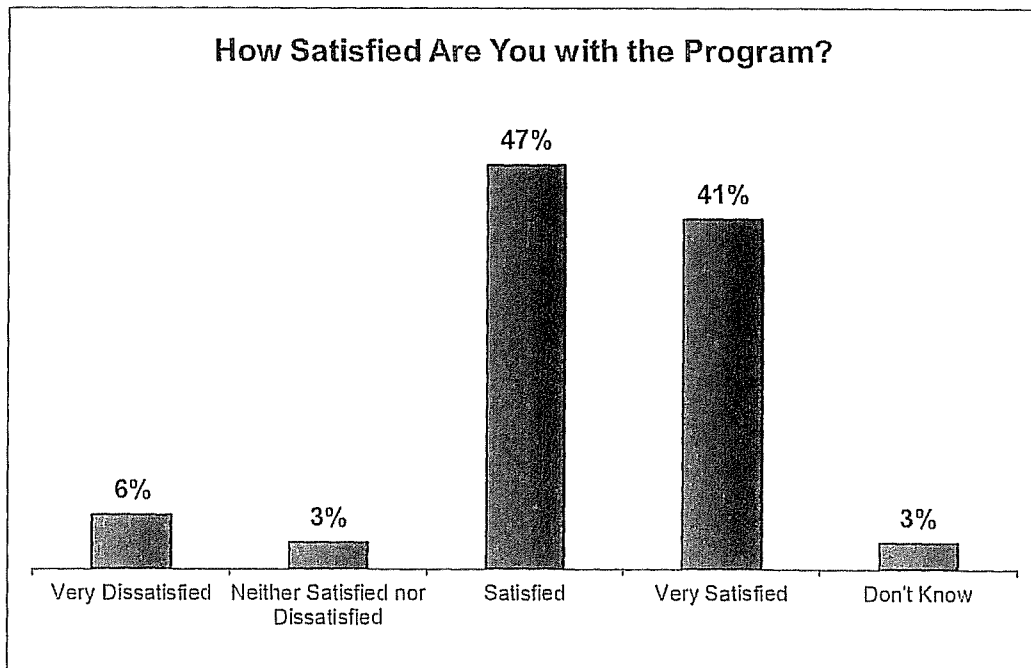
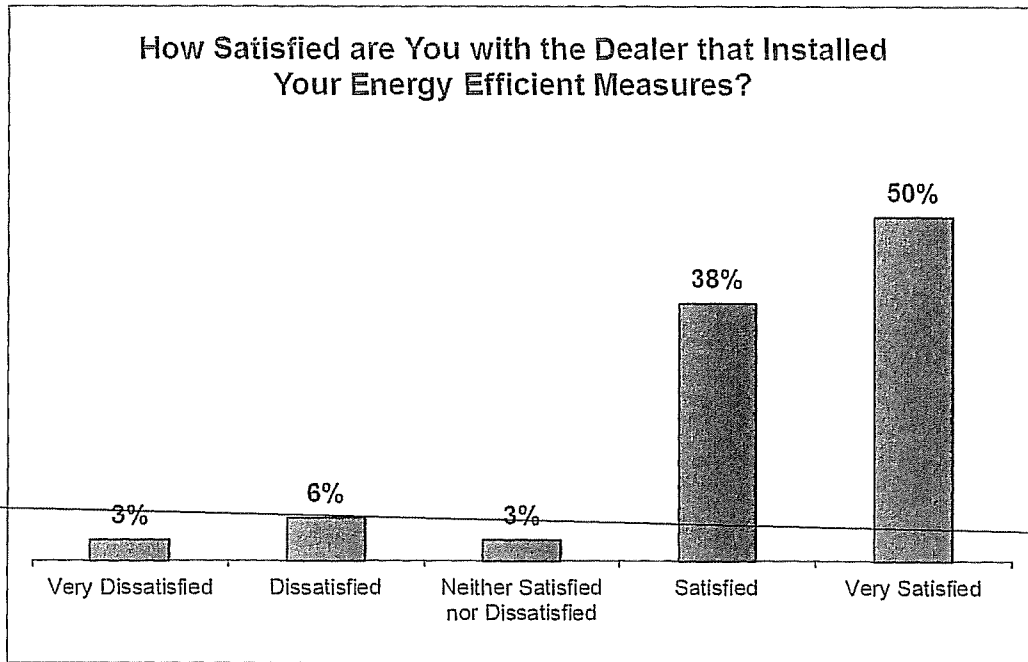
How Satisfied Are You with the Program?



Appendix – Non-All-Electric Survey







Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
argraves@aep.com

Joseph Chambers
Contractor
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kivass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrniecek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com




The logo for AEP (American Electric Power) is displayed in white text on a dark, textured rectangular background.

Evaluation Report

Kentucky Power Company Mobile Home Heat Pump

Evaluation Report for 2009-2010

July 2011

A decorative horizontal bar with a textured, stippled appearance is located at the bottom of the page.

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	6
Summary	6
Promotional Effectiveness.....	6
Delivery Mechanism	6
Data Tracking.....	7
Free Riders and Spillover	7
Market Potential	7
Customer Satisfaction	8
Impact Evaluation	9
Impact Results	10
Cost Effectiveness Evaluation.....	11
Prospective Analysis	13
Recommendations.....	14
References	15
Appendix – Impact Methods and Assumptions	16
Impact Methodology.....	16
Billing Analysis.....	16
Analysis Results.....	20
Analysis Graphs.....	21
Control Group Analysis.....	23
Appendix - Engineering Estimates.....	24
Estimation Methodology.....	24
Technology Description	24
Algorithms	25
Terms	25
Validation Rules	25
Assumptions.....	25
Appendix – Exhibits.....	26
Exhibit 1 – Fact Sheet	26
Appendix – Survey	27
Appendix – Heat Pump Dealers.....	29
Appendix – EE/DR Analytics Team Members	32
Load Research.....	32
EE and Consumer Programs.....	32
Marketing.....	32

Executive Summary

The Kentucky Power Company (KPC) Mobile Home Heat Pump (MHHP) program is designed to promote a more efficient HVAC system for mobile home owners. Approximately one third of all the Company's electric space heating residential customers live in mobile homes. Many of these mobile homes are heated and cooled by relatively inefficient HVAC systems. A significant gain in efficiency can be obtained by upgrading these HVAC systems with high efficiency heat pumps. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. For 2009 and 2010, the MHHP program replaced 393 heat pumps, providing 1,015 MWh of net annualized energy savings, 181 kW of summer peak demand savings, and 299 kW of winter peak demand reductions. The process evaluation concluded that the promotion and delivery processes continue to be effective.

Based on the results of the evaluation, the MHHP program was determined to be cost-effective for three of the cost-benefit tests used in the California Standard Practice Manual and KPC should continue to utilize the program through the remainder of the current program life (2011). The prospective analysis of the program for 2012-2014 predicts the program will be cost-effective and should be continued.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio	Winter Peak Ratio
Program Administrator Cost (PACT)	3.28	3.72
Total Resource Cost (TRC)	4.61	5.23
Ratepayer Impact Measure (RIM)	0.65	0.74
Participant Cost (PCT)	8.00	8.00

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	4.72
Total Resource Cost (TRC)	6.41
Ratepayer Impact Measure (RIM)	0.88
Participant Cost (PCT)	8.24

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Kentucky Mobile Home Heat Pump program was developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on December 4, 1995 (Case No. 95-427) to help meet Kentucky Power's goals.

Kentucky Power Company promoted the program through HVAC contractors and paid incentives to both the contractor and the customers who purchased a high-efficiency heat pump to replace their existing electric furnace. The major goals of the Mobile Home Heat Pump program are to:

- 1) Reduce energy consumption of electrically heated mobile homes
- 2) Assist and encourage mobile home owners to improve heating, ventilation, and air conditioning (HVAC) efficiency by installing high efficiency heat pumps
- 3) Increase customer satisfaction and services
- 4) Reduce Kentucky Power's long-range peak demand.

Process and Market Evaluation

Summary

The Program has been in place for many years, and therefore a detailed review of the basic program processes was deemed unnecessary. Rather, the primary concern related to the process and market evaluation was whether the program continues to influence purchasing decisions or whether the market has been fully transformed to the point where new heating system purchases would normally be high-efficiency heat pumps without the program. The 2011 survey of participants indicated that just over 50% of the participants would likely have purchased an equivalent high efficiency heat pump without the program, thus it can be inferred that the program still influenced the decision making of about 50% of customers making heating system replacement decisions in 2009 and 2010.

~~The promotion method employed was effective, but improvements in promotion could be considered.~~
The delivery mechanism continues to be effective, as customer satisfaction levels were high.

Promotional Effectiveness

KPC promoted the program solely through an established network of participating HVAC contractors. In 2010, KPC staff reviewed a database of all HVAC contractors in and near the KPC service territory, pursued recruitment of additional contractors, and successfully expanded the base of participating contractors. KPC staff estimated that 80% of HVAC contractors in KPC service territory are now participating in the program. Participants normally became aware of the program only after they contacted a participating HVAC contractor and inquired about heating system replacement. Some participants may have also heard about the program from neighbors and friends. A customer incentive of \$400, as requested by the Kentucky Demand Side Management Collaborative, and approved by the Kentucky Public Service Commission, was provided to offset a significant portion of the incremental cost of the high-efficiency upgrade. Dealers received a \$50 incentive for each installation to offset the cost of their time and effort. This promotional method is likely effective in reaching customers who need to replace their heating system, but direct program promotion to all customers could accelerate some heating system replacement decisions and provide a better understanding of the program for customers considering HVAC replacements.

Delivery Mechanism

To qualify for the program, each HVAC contractor was required to be licensed and certified. When contacted by a KPC customer, the HVAC contractor explained the program to the customer, described the incentive offered for installing a new high efficiency heat pump, and provided the

customer with the KPC provided marketing material. Once selected for the project, the contractor handled all facets of the installation and provided the Company with customer installation reports from which incentive payments were made to the customer and the contractor. KPC staff entered the information into an Excel spreadsheet for participant tracking, worked with the contractors to resolve any missing or questionable information, and processed the rebates. No on-site inspections were performed to verify the provided heat pump information and quality of contractor installation.

Data Tracking

As a whole, data collection and tracking were adequately performed. Sporadic pieces of data were missing that are required to produce engineering estimates for Air Source Heat Pumps. Each customer must have the baseline and replacement Heating Seasonal Performance Factor (HSPF), Seasonal Energy Efficiency Rating (SEER), Energy Efficiency Rating (EER), and size in tonnage or British thermal unit hours (BtuH). The implementation data for this program was missing the EER of the new heat pumps. Without EER, accurate demand estimates cannot be made.

Free Riders and Spillover

A free rider is a participant who installed a high-efficiency heat pump system, but would have installed the same system had they not participated in the Program. Spillover refers to additional energy efficiency measures adopted by participants as a result of the program. Free ridership was determined by dividing the total survey responses by the positive responses to the questions "Had you planned on installing a heat pump before you heard about the program?" and "Would you have installed a heat pump if the program was not available?" From the survey responses, 53% of participants indicated they would have purchased the same high-efficiency heat pump without the program and thus were classified as likely free riders in this program. No information on possible spillover effects was captured in the survey.

Market Potential

The 2010 Residential Customer Survey showed that approximately 20,000 KPC households reside in mobile homes which they own. Almost 70% use electricity for heating and over 50% of those currently heat with a central forced air furnace. Over 6,000 of the HVAC systems in those homes are more than ten years old, and over 2,000 are older than 15 years. The 2011 participant survey indicated that 53% of the participants would have purchased a high-efficiency heat pump without the program, indicating that the choice of a high-efficiency heat pump is becoming more common. Even though the choice is becoming more common, there is clearly still a continuing need for encouraging high-efficient heat pump installations as replacements for central furnace systems. Setting a goal of influencing at least 200 purchases in each of the next two years seems achievable.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was very high, with 95% of the survey respondents indicating they were very satisfied (45%) or satisfied (50%) with the program. One respondent was very dissatisfied and two were dissatisfied. From the comments received the source of the very dissatisfied and one of the dissatisfied responses was the recent KPC rate increase and not the MHHP program itself. The lone dissatisfaction with the program appeared to be related to the heat output of the MHHP, which is not unexpected for someone who was used to the warmer air produced by a forced air furnace.

Impact Evaluation

The MHHP evaluation consisted of a billing analysis coupled with engineering estimates of the implementation data collected by KPC. The billing analysis was used to determine net savings by participant. The engineering estimates were used to develop gross measure savings by participant. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. To effectively capture the change in usage patterns, an evaluation needs both pre- and post-installation billing data. The per-participant billing analysis savings are compared to the per-participant engineering estimates to determine an estimated Net-to-Gross ratio. In theory, the billing analysis results should capture the free ridership and spillover behaviors of participant group. Those results are then compared to the survey results to see if the free ridership and spillover questions asked corroborate the analysis. Further details of the billing analysis and engineering estimates can be found in the appendixes.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. Once a valid set of customers was determined, the next step was to perform a billing analysis and create engineering estimates using the algorithm for Air Source Heat Pumps (Appendix – Engineering Estimates) to determine an average per-participant energy, summer peak, and winter peak savings value. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings are in the below table.

2009 and 2010 Average Net Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
Per Participant Savings	2,583	0.460	0.760

For 2009, KPC had goals of replacing 110 customers' heat pumps and saving KPC customers 192 MWh, 40 kW in summer peak demand, and 80 kW in winter peak demand. The program replaced 160 heat pumps, and produce net annualized total program savings of 413 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized summer peak demand reductions were 74 kW, and the winter peak demand reductions were 122 kW. KPC met 145% of their participant target, 215% of their energy target, 184% of summer demand target, and 152% of their winter demand target.

For 2010, KPC had goals of replacing 150 heat pumps and saving KPC customers 262 MWh, 55 kW in summer peak demand, and 109 kW in winter peak demand. The program replace 233 heat pumps,

and produce net annualized total program savings of 602 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized summer peak demand reductions were 107 kW, and the winter peak demand reductions were 177 kW. KPC met 155% of their participant target, 229% of their energy target, 196% of their summer demand target, and 162% of their winter demand target.

For the first two years of the MHHP program, KPC replace 393 heat pumps, producing net annualized program savings of 1,015 MWh of energy savings, 181 kW in summer peak reductions, and 299 kW in winter peak reductions. KPC met 151% of their participant target, 223% of their energy target, 191% of their summer demand target, and 158% of their winter demand target. All numbers were at or above the expected goals.

Impact Results

The four key statistics used in an impact evaluation – number of participants, energy savings, summer peak demand reduction, winter peak demand reduction – are shown below. Included in the table are the program goals, the ex-ante savings, and the ex-post savings. Ex-ante savings are forecasted savings as reported by the program staff during the program's implementation. Ex-post savings are estimated savings as determined by the impact evaluation and reported in the evaluation report. Savings are presented by each segment of customers, resistance and replacement, and total savings are summarized at the end.

Below are the impact evaluation results for the customers that previously had resistance heating. The negative summer demand savings are actually load growth, not reduction.

Impact Evaluation Results by Year for MHHP Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	110	160	160	145%
Energy (MWh)	192	280	413	215%
Summer Demand (kW)	40	58	74	184%
Winter Demand (kW)	80	116	122	152%
2010				
Participants	150	233	233	155%
Energy (MWh)	262	408	602	229%
Summer Demand (kW)	55	85	107	196%
Winter Demand (kW)	109	170	177	162%
Total				
Participants	260	393	393	151%
Energy (MWh)	455	687	1,015	223%
Summer Demand (kW)	95	143	181	191%
Winter Demand (kW)	189	286	299	158%

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects. Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included for recovery purposes, unless new labor was utilized incrementally and specifically for DSM program implementation.

The expenditure goal for 2009 in the Collaborative Report was \$49,500 for 110 participants. The total program costs as filed were \$71,900 of which \$64,000 were listed as incentives for 160 participants. However, these costs do not include the unrecoverable administrative costs from KPC staff and AEPSC staff. An estimated \$17,091 was included under administration to account for unrecoverable costs, bringing the total to \$88,991 in actual costs related to the program. The expenditure goal for 2010 in the Collaborative Report was \$67,500 for 150 participants. The total filed program costs were \$104,800, of which \$83,300 were incentives for 233 participants. To account for unrecoverable admin costs and the costs from the 2011 evaluation, another \$11,775 was included for 2010 and \$10,000 was added in 2011 to account for admin and evaluation costs respectively.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analysis attempted to account for all costs related to program implementation and evaluation. Therefore an estimate of the value of KPC and AEP Service Corporation (AEPSC) staff time utilized to implement and evaluate the program was added to the reported costs. The below table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	Total
2009	\$17,091	\$7,900	\$64,000	\$-	\$88,991
2010	\$11,775	\$21,500	\$83,300	\$-	\$116,575
2011	\$-	\$-	\$-	\$10,000	\$10,000

Goals were reported as total amounts respective to the winter peak only, however, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP generation pool that experiences summer peaking conditions, and winter to account for KPC's maximum system load that occurs in the winter. Benefit costs tests were performed by Resistance Heat, Replacement, and Total participation. Results were lower than expected, though unremarkable. It is expected that prospective benefit cost ratios for some programs will be overestimated, sometimes wildly, due to the sunny disposition and uncertain nature of market potential studies.

Program goals were to have a Program Administrator Cost (PACT) ratio of 6.02, a Total Resource Cost (TRC) ratio of 9.79, a Ratepayer Impact Measure (RIM) ratio of 3.45, and a Participant Cost (PCT) ratio of 9.07. Results for benefit cost ratios at summer peak are 3.28 for the PACT, 4.61 for the TRC, 0.65 for the RIM, and 8.00 for the PCT. Results for benefit cost ratios at winter peak are 3.72 for the PACT, 5.23 for the TRC, 0.74 for the RIM, and 8.00 for the PCT.

Total program benefit cost results were cost-effective from Participant, Program Administrator, and Total Resource perspectives. All three ratios (PCT, PACT, and TRC) are considered greater than one, and cost beneficial, regardless of peak season.

2009 and 2010 Summer Peak Cost Effectiveness Analysis

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	3.28	\$ 470,444	\$ 676,565	\$ 206,121
Total Resource Cost (TRC)	4.61	\$ 529,875	\$ 676,565	\$ 146,690
Ratepayer Impact Measure (RIM)	0.65	\$ (361,547)	\$ 676,565	\$ 1,038,112
Participant Cost (PCT)	8.00	\$ 1,042,743	\$ 1,191,775	\$ 149,032

2009 and 2010 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	3.72	\$ 560,865	\$ 766,986	\$ 206,121
Total Resource Cost (TRC)	5.23	\$ 620,296	\$ 766,986	\$ 146,690
Ratepayer Impact Measure (RIM)	0.74	\$ (271,126)	\$ 766,986	\$ 1,038,112
Participant Cost (PCT)	8.00	\$ 1,042,743	\$ 1,191,775	\$ 149,032

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, there will be any changes to the cost effectiveness of the program in future years. Any number of a multitude of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the MHHP program, results from the current evaluation were used as the starting point for the cost-benefit analysis. Future savings values were discounted due to the nature of the program being a market transformation program. Free ridership was kept at 47% during the prospective analysis; it is not expected to increase at this time. The results were expected to be higher due to an increase in the cost of avoided energy in future years.

Due to KPC being a winter peaking utility, only the winter peak cost benefit analysis was run. The results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective and should be continued.

2012-2014 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	4.72	\$ 1,261,556	\$ 1,601,079	\$ 339,523
Total Resource Cost (TRC)	6.41	\$ 1,351,392	\$ 1,601,079	\$ 249,688
Ratepayer Impact Measure (RIM)	0.88	\$ (214,856)	\$ 1,601,079	\$ 1,815,936
Participant Cost (PCT)	8.24	\$ 1,797,976	\$ 2,046,184	\$ 248,208

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the MHHP program.

- 1) Results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective. It is our recommendation that this program be continued. SEER levels offered should continue as is, until the free ridership levels rise to near 50%.
- 2) Inclusion of EER for every heat pump installed, and if possible, the EER of the replacement heat pump should be collected.
- 3) Future costs should be captured in a more organized and delineated manner. Each program should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.

- 4) On-going program management should be handled by KPC staff, including tracking of customer participation and estimated ex-ante savings.
- 5) KPC staff labor time spent on the Program should be captured so that the true total cost of delivering the program can be known.
- 6) KPC should request AEP add fields or processes to capture HVAC information on their customers, specifically the current type heating and cooling systems in the home. This would provide a more accurate way of comparing the participant group to the population for billing analyses.
- 7) KPC should request AEP add fields or processes to capture building type on their customers. One of the greatest levels of uncertainty in the analysis is not being able to easily and accurately match participant customers to control customers constrained by a population of mobile home customers only.
- 8) Program participants should be surveyed shortly after the rebate is processed.
- 9) KPC staff should perform on-site installation audits for a small sample of participants. This may necessitate adding another employee.
- 10) KPC should gather information from the dealers about customers that were interested in the program but declined to participate. Using that information, KPC should then sample the customer list and perform a non-participant survey to find any reasons for non-participation.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.
- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual, Ohio TRM – Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.

- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template, Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline. MS Excel Workbook. 20 May 2010.
- VII. AEP Load Research Analysis Evaluation Report for the Mobile Home Heat Pump Program in Kentucky Power Company Program Period: January 2006 – December 2007. October 2008.
- VIII. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- IX. Mohr, Lawrence B. Impact Analysis For Program Evaluation. 2nd Ed. 1995
- X. The SAS Institute The EXPAND Procedure.
http://support.sas.com/documentation/cdl/en/etsua/60372/HTML/default/viewer.htm#expand_toc.htm
- XI. DeBoor, Carl (1981), A Practical Guide to Splines, New York: Springer-Verlag.
- XII. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- XIII. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XIV. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix – Impact Methods and Assumptions

Impact Methodology

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long-term savings from the specific installations.

Billing Analysis

Impact evaluation consists of two stages, interim impact evaluation and full impact evaluation. Engineering estimates are used to develop measure savings without post-consumption data. Implementation data is utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. The full impact evaluation consists of a billing analysis. This analysis utilizes relevant weather data and billing data with the statistical regression models to determine the savings impact of the program. A comparison of customers' bills before and after the implementation of the program is used to determine changes in usage and demand that can be attributed to the program. In order to isolate the effects of the program from unassociated changes in consumption, a Participant Group and a distinct but similar Control Group is compared. The Control Group will not contain program participants, but its customers will be similar in consumption to the program participants. After defining these research groups, billing data is weather-normalized to eliminate any effects due to weather differences before and after program implementation. Finally, regression models will be used to analyze the normalized data and provide savings values.

The first step of the billing analysis is to create a valid participant list from which to analyze. Each customer is checked to ensure that data existed for at least one year pre and post measure installation. Participants were also required to have data for all of 2008 to develop a set of comparison metrics for drawing the control group. Any customers that did not have the requisite billing data, or were inactive at the time of analysis, were discarded from analysis.

For 2009, the implementation data provided showed that 160 customers participated. One customer was not active in the AEP Customer Information System (CIS) at the time of installation, and 26 were not

found in the CIS at all. In all, 138 customers were available for analysis. In 2010, after validation, 22 customers were not in the AEP CIS; leaving 206 customers available for analysis. In total there were 344 customers in the implementation data that were valid for analysis.

After the participant list was created, a set of energy statistics was developed to compare to the control group. For each customer, an annual kWh, summer peak month kWh, and winter peak month kWh (formulas below) were calculated using 2008 billing data. KPC summer and winter peaks were pulled from the AEP Load Research system peak data and applied to each customer bill that contained that date, and was used to create a summer and winter monthly energy value.

Formula for determining comparison statistics between participant and control group

~~$$kWh_{annual} = 365 \times \frac{\sum kWh_per_Bill}{\sum Days_per_Bill} \quad kW_s = 31 \times \frac{kWh_per_Bill_s}{Days_per_Bill_s} \quad kW_w = 31 \times \frac{kWh_per_Bill_w}{Days_per_Bill_w}$$~~

After participant group selection is complete, the KPC population is validated to provide a list of potential control group customers. The population is usually constrained by one or more of program class (residential, C&I, etc...), building characteristics (single-family, mobile home, etc...), fuel type (all electric, natural gas, etc...), and income level (HEAP, non-HEAP, all). Customers are removed from consideration if they are not continuously active from January 1, 2008 until current. After the control population has been validated, comparison statistics are calculated using the above formulas.

After the control population group has been established, and both the control population's and participant group's comparison statistics have been calculated, the control population's customers are compared to the participants to provide a baseline comparison. Each participant customer is matched to all control population customers, and the top 40 most accurate matches are kept for further analysis. Matching is determined by calculating an Absolute Relative Deviation (ARD) for the Annual kWh, summer kWh, and winter kWh comparison statistics. The customers with the lowest combined ARD are kept for further validation. For each of the 40 control customers, they are assigned the same installation date as the participant customer. Each of the 40 customers is then validated using the same pre/post rules as the participant customers. Each control customer must have at least one year of data pre and post the pseudo-installation of the measure.

Formula for comparing control population customer to participant

$$ARD = ARD_{kWha} + ARD_{kWhs} + ARD_{kWhw}$$

$$ARD_{kWha} = \frac{|kWha_{ctrl} - kWha_{part}|}{kWha_{ctrl}} \quad ARD_{kWhs} = \frac{|kWhs_{ctrl} - kWhs_{part}|}{kWhs_{ctrl}} \quad ARD_{kWhw} = \frac{|kWhw_{ctrl} - kWhw_{part}|}{kWhw_{ctrl}}$$

After the 40 customers have been compared to the participant, the top 20 are kept for further evaluation. Twenty control groups are used for comparison because of the variance of the population. The population variance is high because the AEP CIS does not contain enough demographic data on the customer to create a very accurate regression model. There are too many lurking variables in a billing analysis if enough data is not included, which can bias the results. Once the 20 control groups have been selected, each group is run, pairwise, with the participant group through the entire billing analysis process. Final results for each run of the analysis are compared to ensure that none of the control groups are extreme in either direction (load savings or load growth). Using an alpha of .05 for Type I error testing, and a beta of .10 for Type II, or power testing, checks are completed to ensure that the control group methodology is valid. Once the methodology is verified, the first control group, being the most accurate, is used for the regression portion and official savings calculations. If there are concerns about uncertainty, all 20 control groups will be run and the numbers will be aggregated as a replicated analysis.

The regression analysis is conducted by constructing two models, a baseline and treatment weather normalized panel model. A panel analysis is a two-dimensional time-series and cross-sectional model used to evaluate changes in the effects of a treatment on a treatment group compared to a control group over time. Weather Normal, or Typical Meteorological Year, data is created by the U.S. National Renewable Energy Laboratory (NREL) to represent weather data for a typical year. The TMY2 dataset was used for all KPC billing analysis, and is derived from the 1961-1990 National Solar Radiation Data Base (NSRDB).

The baseline model is created using at least one year of billing data pre-installation to develop a weather normalized billing function (see formula below). The treatment model is created using at least one year of billing data post-installation. Each customer is assigned a weather station, average daily temperature, cooling degree day, and heating degree day summaries to each bill. Degree days are calculated by summing the number of hours per day by the degrees per hour above or below a temperature break point. For heating degree days, the breakpoint temperature is set at 65 degrees Fahrenheit. Cooling degree days are calculated using 70 degrees Fahrenheit as the breakpoint. Once the necessary data has been created, an autoregressive model is fit to the data for each customer to

create the betas necessary to predict data. Each beta represents the multiplier coefficient for the incremental value of each model variable. To forecast or estimate new kWh, multiply the regression betas by the new data.

Weather normalized regression model

$$kWh = (\beta_{daily_kwh} \times Days) + (\beta_{ADT} \times ADT) + (\beta_{CDD} \times CDD) + (\beta_{HDD} \times HDD) + (\beta_{CDD^2} \times CDD^2) + (\beta_{HDD^2} \times HDD^2) +$$

Once the baseline and treatment models have been determined, the model betas are multiplied by weather normal data to create baseline weather normalized bills for each customer. Once the bills have been forecasted, the data is aggregated to create annualized normal energy usage per customer. Each customer has an estimated baseline and treatment annualized kWh. The difference between the estimated baseline and treatment kWh is the energy savings due to the program. The annualized energy estimates are then summarized by participant group and control group, and multiple t-tests are completed to compare the savings of each group, and their pairwise difference.

Once the annualized savings numbers have been calculated, the forecasted bills are used to create monthly and daily load shapes for DSMore. The monthly load shape is created by temporally disaggregating the bills from a cycle month to a calendar month. Traditional load research techniques use linear interpolation method of determining an average energy usage per day per bill, then creating a stepped daily load shape. This method maintains transformation under integration, meaning one can move from cycle month to billing month without loss of accuracy; however the ability to detect peaks using this method is very limited. The second method, utilized in this evaluation, is to create a daily load shape using cubic splines. This method is also closed under integration, and is the preferred method for temporal disaggregation when using SAS (Statistical Analysis Software®). AEP Load Research has done studies comparing the accuracy of both methods in predicting daily load shapes of interval metered customers, and found that the cubic spline disaggregation is more accurate when using goodness-of-fit statistics. However, the primary reason for using cubic splines is the ability to put more load on the peak days of the month. Using the cubic spline method, the forecasted bills are disaggregated to a 365 day daily load shape for each customer. Using the daily load shape, the customers are aggregated using traditional load research methods, to determine a domain load shape. For the MHHP program, there were no domains below the program level, just mobile home customers.

Next, the peak day history for KPC is used to create a typical peak day for both the summer and winter peak. This is done by averaging the day per year for each year to determine the average day-per-year. As an example, if the last five winter peaks occurred between January 11th and January 15th, it is expected that the average day-per-year peak day will be January 13th. After the typical peak date for

the summer and winter peaks has been determined, the KPC Residential Load Research class load shape, as determined by AEP Load Research, is retrieved for each peak date. Using the Residential class load shape, the proportion of energy used at the peak hour, relative to the total energy for the day is determined as a load factor. To determine the summer and winter peaks, the daily energy from the cubic spline disaggregation is divided by the load factor and 24 (hours per day) to determine the average peak demand reduction for each season. The formula is below:

Peak demand reduction formulas

$$kW_S = \frac{kWh_{peakdayS}}{24} / LF_S \qquad kW_W = \frac{kWh_{peakdayW}}{24} / LF_W$$

Analysis Results

The below graphs contain the summary panel, profile plot, and agreement plot from SAS, created during the PROC TTEST procedure. Particular attention should be paid to the uncertainty of the parameter estimate for the mean. Because of the uncertainty involved in the model, any savings estimate within the Lower Confidence Level (LCL) and Upper Confidence Level (UCL) is within plus or minus two standard errors of the mean. What this means is that the findings of the billing analysis show that the *ex-ante* savings estimate of 1,749 kWh per participant is not statistically different from the *ex post* savings estimate to the 95% confidence level.

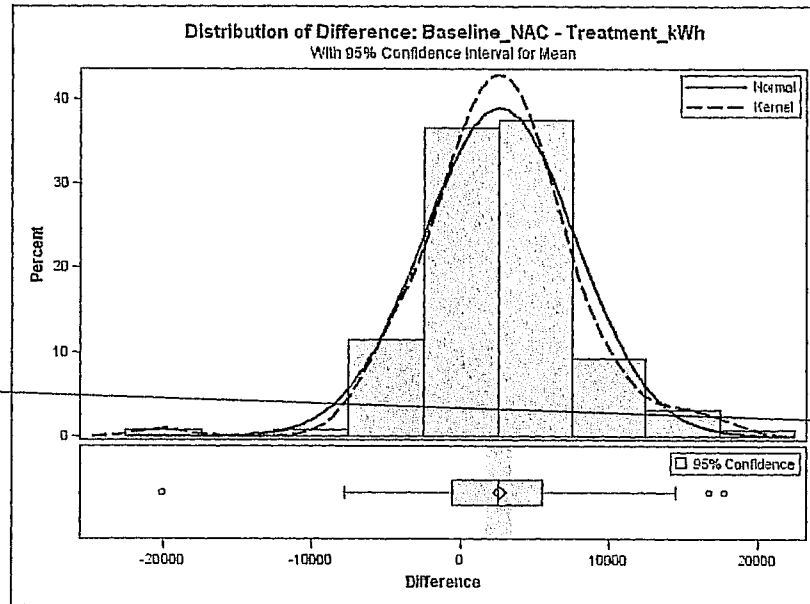
Because of the inability to produce a control group consisting of only mobile home customers, all twenty control groups were ran and aggregated. A cursory glance of the control group baseline and treatment comparisons show extreme variability. Had only one control group been run, the savings could have been as low as 1,229 kWh or as high as 2,323 kWh. Running multiple iterations of the billing analysis allows us to take advantage of the Central Limit Theorem and create a better estimate of the per participant savings. Control group variation numbers are presented after the charts and graphics.

Summary Statistics: All Customers

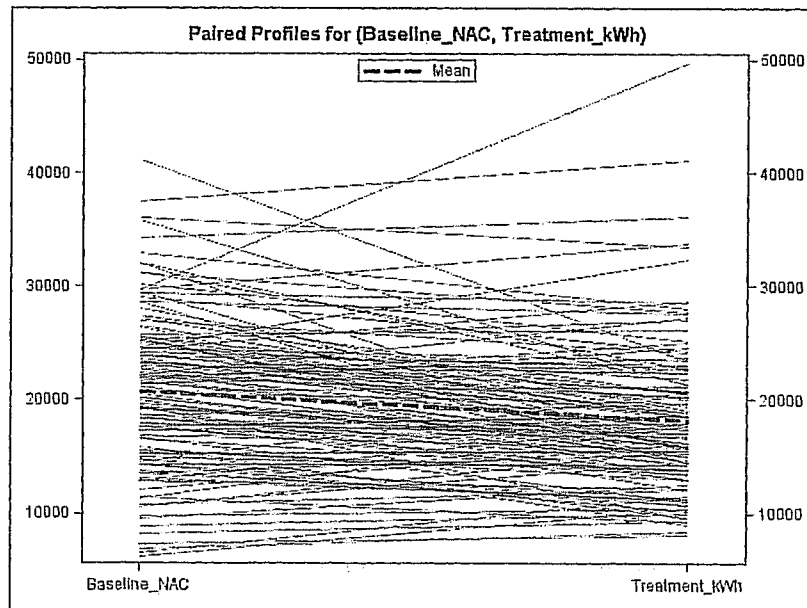
N	Mean	Std Dev	Std Err	95% CL Mean	Summer kW	Winter kW
131	2,583.1	5,127.9	448.0	1,696.8 3,469.5	0.460	0.760

Analysis Graphs

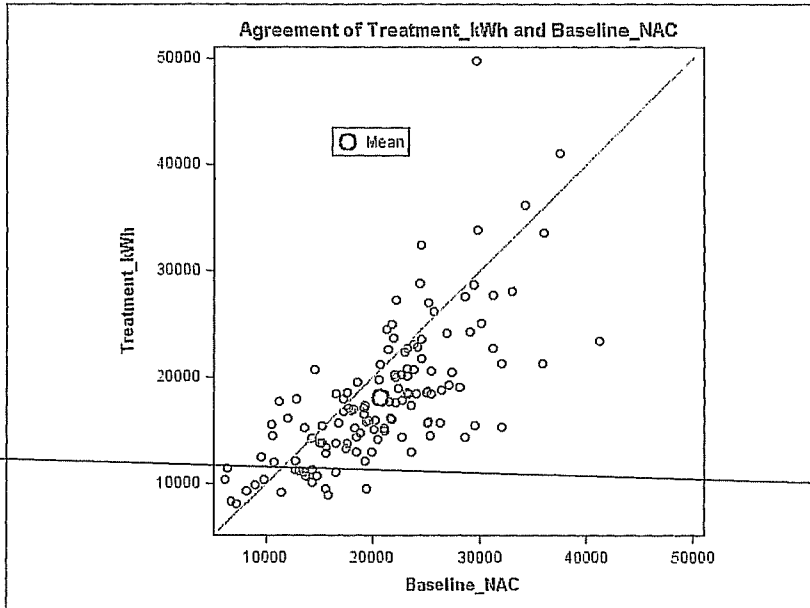
Summary Panel:



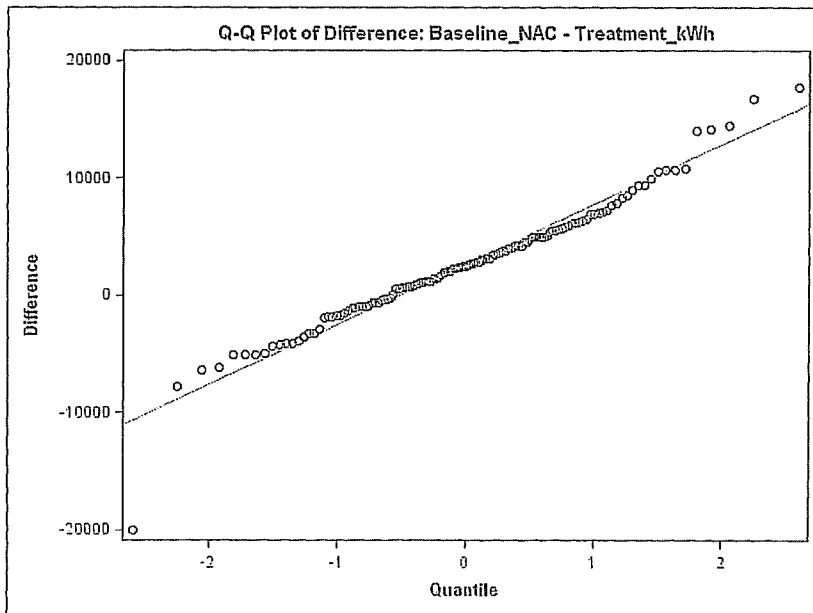
Profile Plot:



Agreement Plot:



Q-Q Plot:



Control Group Analysis

When performing a billing analysis to determine the impacts for program evaluation, the participant group needs to be matched to a set of control customers. For historical analyses, the literature suggests a single control group be matched to the participant list in order to provide a valid set of customers from which to compare. This is done to remove any activities that are related to free ridership: i.e. those activities that would have occurred without the program. However, this author feels that without a robust set of demographic data to make customers comparisons more accurate than AEP's current CIS contains, a billing analysis must treat the control group selection as a replication of quasi-experimental designs. Quasi-experimental design, or "before and after" design, is distinguished by the non-randomness of the control and participant selection groups. However, given the limited demographic data, we substitute the rigorous selection with an increase in replications. Classical statistics (sometimes called Frequentist statistics) is predicated on the notion of repeated trials to infinity, e.g. the relative frequency of a statistics as the trials near infinity. However, in practice, most statistics that is performed is done using a single repeated trial. In many cases, and disciplines, this is an accepted, even celebrated practice. However, in impact analysis of programs, the usage uncertainty and disparity of customer demographics at a premise (number televisions, HVAC usage, work schedule, occupants, etc....) demands that more than one replication be undertaken. Below is the list of control groups generated for this analysis and how each iteration would have compared to the per participant savings calculated in the billing analysis.

Control Group Comparison to Per Participant kWh

Analysis Group	Baseline Mean	Treatment Mean	Ratio	Per Participant kWh if Chosen	Loss/Gain From Mean
Control_01	21,472	20,600	95.94%	2,472	(111)
Control_02	21,120	20,288	96.06%	2,498	(85)
Control_03	21,819	20,995	96.22%	2,533	(51)
Control_04	21,109	20,658	97.86%	2,885	302
Control_05	20,966	20,528	97.91%	2,895	312
Control_06	22,422	21,638	96.51%	2,593	10
Control_07	22,346	21,374	95.65%	2,409	(174)
Control_08	21,273	20,689	97.26%	2,755	172
Control_09	21,517	20,977	97.49%	2,805	222
Control_10	21,414	20,591	96.16%	2,518	(65)
Control_11	21,204	19,731	93.05%	1,851	(732)
Control_12	21,222	21,206	99.93%	3,328	745
Control_13	21,742	21,347	98.19%	2,954	371
Control_14	21,330	20,534	96.27%	2,542	(41)
Control_15	21,878	20,926	95.65%	2,409	(174)
Control_16	21,454	20,770	96.81%	2,659	76
Control_17	20,857	19,767	94.77%	2,221	(362)
Control_18	22,090	20,779	94.07%	2,069	(514)
Control_19	20,963	19,622	93.60%	1,970	(613)
Control_20	21,365	21,329	99.83%	3,308	725

Appendix - Engineering Estimates

Estimation Methodology

To calculate annualized energy savings, an average per-measure savings must be determined based on the heating and cooling savings from the increased efficiency of the heat pump. Heating savings are determined by the inverse difference of the Heating Seasonal Performance Factors (HSPF) between the baseline heat pump and the increased efficiency heat pump. Cooling savings are determined by the inverse difference of the Seasonal Energy Efficiency Rating (SEER) between the baseline and upgraded heat pumps. Each savings value is scaled based on the size of the heat pump by tonnage or British Thermal Unit Hours (BtuH) to determine the per-participant, per-year usage. The per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. This number is compared to the billing analysis values to see if the survey free ridership and spillover questions are comparable to the analytically determined values.

Technology Description

A heat pump is a high efficiency year-round heating and cooling system operating entirely on electricity. The system is called a heat pump because it pumps or moves heat from one area to another. The basic components of a heat pump are a compressor; circulating fluid (refrigerant); and two heat exchangers, one outside and one inside. In winter, heat is extracted from cold outdoor air even when the temperature is well below freezing. The heat is absorbed by the refrigerant, and then is pumped through the compressor to the indoor coil (heat exchanger) where the refrigerant releases its heat to the indoor air. Since there is less heat available at low outdoor temperatures, the heat pump system includes a supplemental resistance heater that automatically provides additional heat when the outdoor air temperature is too low for the heat pump compressor to supply the home's total heating demand. In the summer, the heat is absorbed by the refrigerant in the indoor coil from the circulating indoor air. The heat-laden refrigerant from the indoor coil is pumped to the outdoor coil where the heat is transferred to the outdoor air. The heat pump system is the most efficient way to heat and cool electrically. The most significant energy savings are obtained during the heating season since it utilizes the "free" heat that already exists in the outdoor air. The heat pump energy efficiency is determined by the seasonal energy efficiency ratio (SEER) for summer and the heating seasonal performance factor (HSPF) for winter.

Algorithms

$$kWh = \left[\left(FLH_{cool} \times \frac{BtuH}{1000} \times \left(\frac{1}{SEER_{base}} - \frac{1}{SEER_{ev}} \right) \right) + \left(FLH_{heat} \times \frac{BtuH}{1000} \times \left(\frac{1}{HSPF_{base}} - \frac{1}{HSPF_{ev}} \right) \right) \right]$$

$$kW = \frac{\left(BtuH \times \left(\frac{1}{EER_{base}} - \frac{1}{EER_{ev}} \right) \right)}{1000} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
FLH _{cool}	Full Load Cooling Hours by closest weather related large city
FLH _{heat}	Full Load Heating Hours by closest weather related large city
BtuH	Size of equipment in British Thermal Unit Hours
SEER _{base}	SEER efficiency of baseline unit
SEER _{ev}	SEER efficiency of installed unit
HSPF _{base}	Heating Season Performance Factor for baseline unit
HSPF _{ev}	Heating Season Performance Factor for installed unit
EER _{base}	EER efficiency of baseline unit
EER _{ev}	EER efficiency of installed unit
CF	Coincidence Factor

Validation Rules

Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis.
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Free Ridership	47%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%
Measure's expected life in years	15
Fully Loaded Cooling Hours	1,150
Fully Loaded Heating Hours	1,975
Summer Coincidence Factor	0.7
Winter Coincidence Factor	0.5

Appendix – Exhibits

Exhibit 1 – Fact Sheet

AEP KENTUCKY POWER
A unit of American Electric Power

Mobile Home High Efficiency Heat Pump Program
Fact Sheet

Program Overview
Kentucky Power's Mobile Home Heat Pump Program offers \$400 to residential customers who live in a mobile home and upgrade their central electric resistance heating system with a new, high efficiency heat pump unit. To qualify, the new heat pump unit must have a minimum rating of 13 SEER (Seasonal Energy Efficiency Ratio) and 7.7 HSPF (Heating Seasonal Performance Factor).

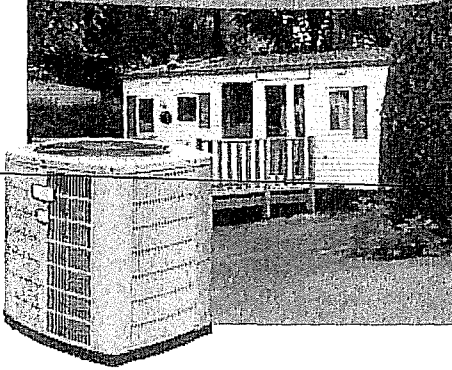
Electric resistance heat is a very efficient form of heating, but it can be costly. A heating element, like the inside of a toaster, heats up and a fan blows the heated air into your mobile home. Heat pumps can easily cut electricity use when compared with electric resistance heating.

Simply put, a heat pump is an air conditioner that is able to reverse cycle to provide heating. It is a very efficient and economical way to heat and cool your home using electricity. It's also a wise energy investment for mobile homeowners that can help reduce your monthly electric bills without sacrificing comfort.

Customer Eligibility
All residential customers who have had electric service with Kentucky Power for the past twelve months and who live in a mobile home with a central electric resistance heating system are eligible to participate.

How to Participate
Call our Customer Solution Center at 1-800-572-1113 or contact your local, licensed HVAC dealer who is participating in the Kentucky Power SMART Programs. Kentucky Power recommends getting at least two quotes and does not endorse any specific heating and cooling dealer.

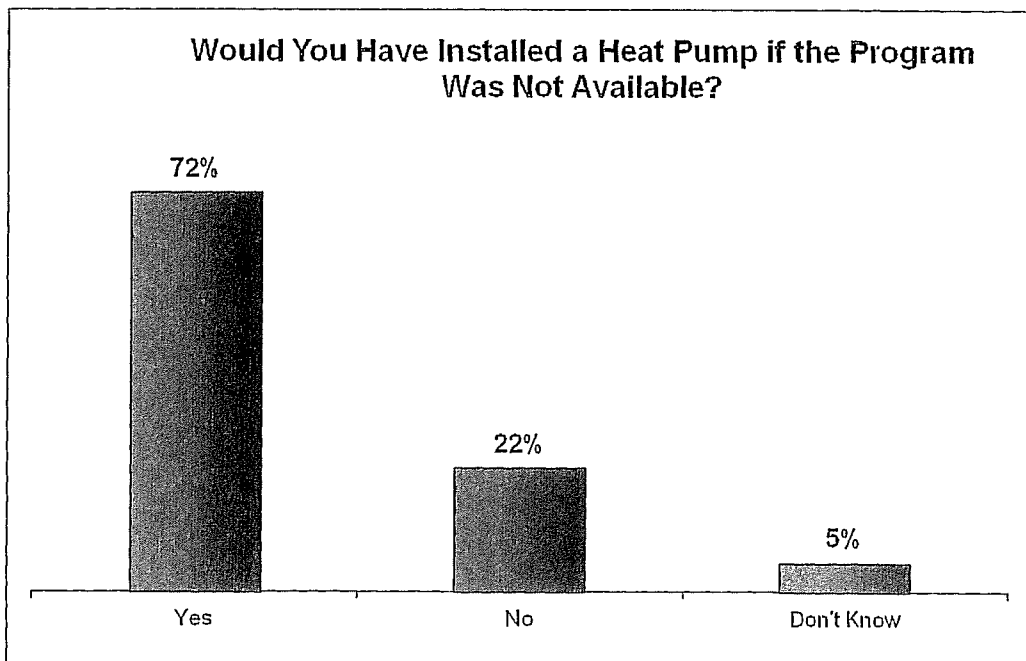
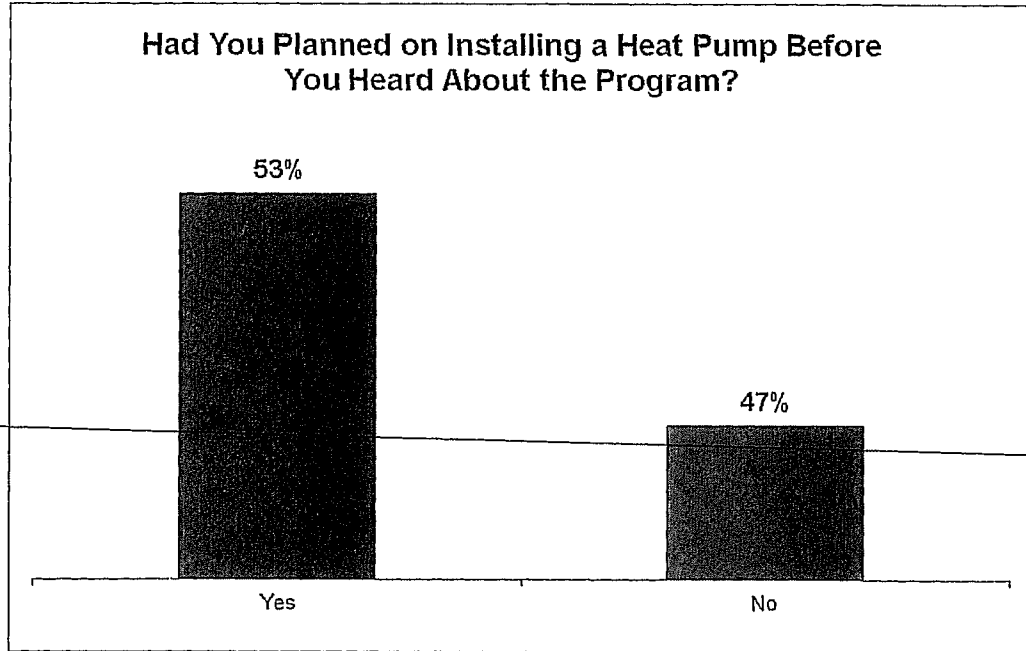
Other Opportunities
The High Efficiency Heat Pump Program is part of Kentucky Power's suite of SMART Programs, which are energy efficiency programs for homes, businesses and schools. For more information on this program or other SMART Programs, call 1-800-572-1113 or visit KentuckyPower.com/save.

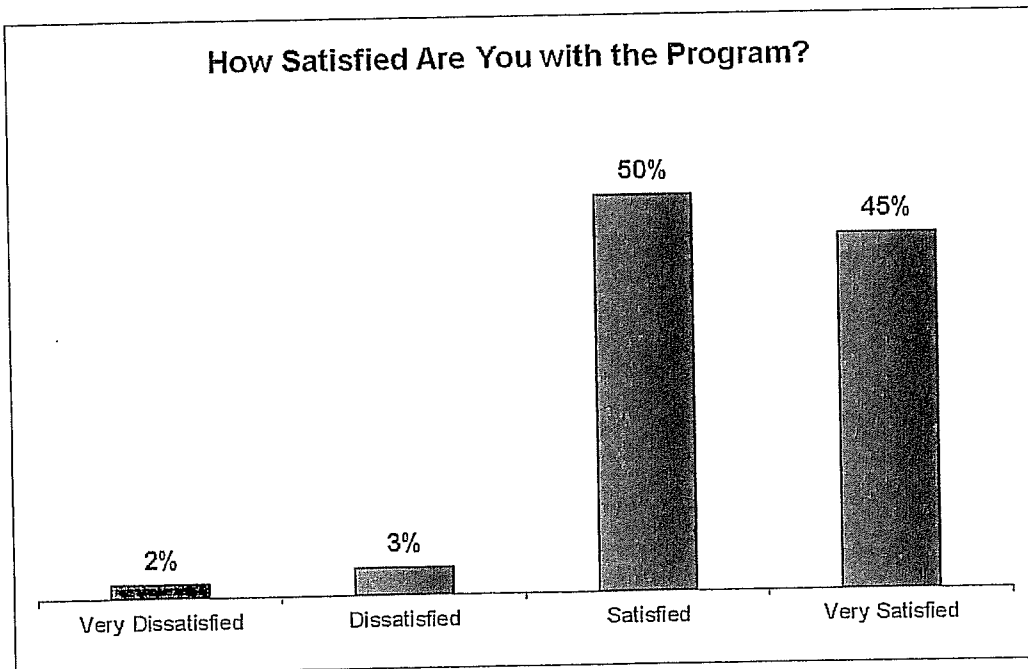
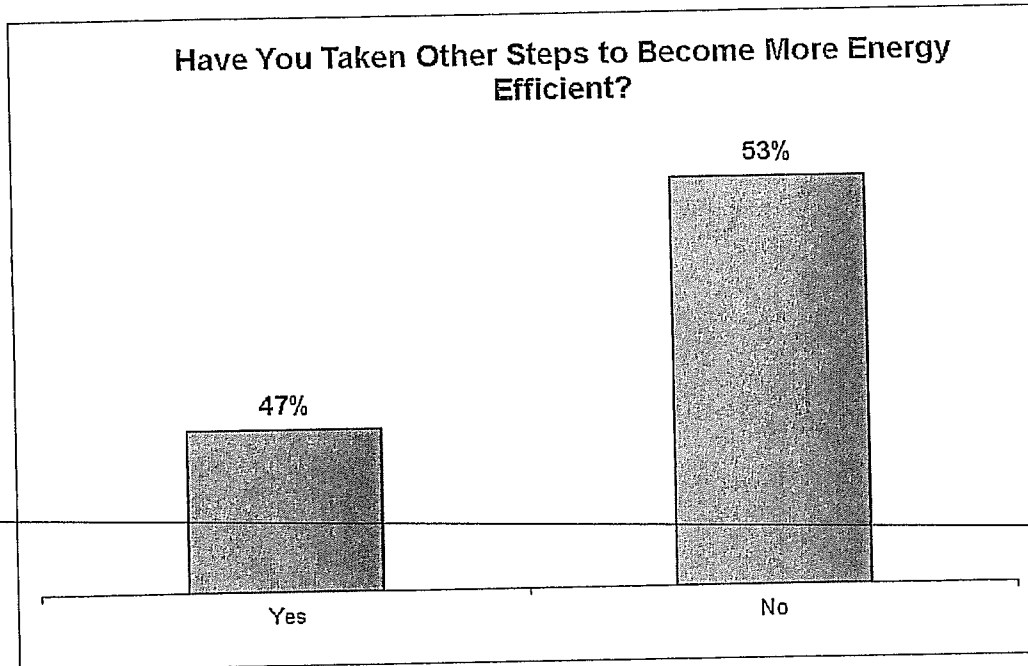


SMART Programs – Saving Money And Resources Together³

gridSMART
From Kentucky Power

Appendix – Survey





Appendix - Heat Pump Dealers

A W R
77 Cow Hollow
Drift, KY 41619
(606) 377-9730

Aire Serv
2106 1/2 13th Street
Ashland, KY 41101
(606) 324-1033

Appalachian Refrigeration
P. O. Box 400
Avawam, KY 41713
(606) 436-0682

B & B Heating & Cooling
P. O. Box 308
Harold, KY 41635
(606) 478-9400

Bobby Howard & Sons
P. O. Box 38
Whitesburg, KY 41858
(606) 633-9580

**Burcheit's Heating & Air
Conditioning**
P. O. Box 665
Wittensville, KY 41274
(606) 297-6224

**Cadco Heating & Air
Conditioning**
2181 Winchester Avenue
Ashland, KY 41101
(606) 928-3041

Clay's Heating & Cooling
P. O. Box 1764
Prestonsburg, KY 41653
(606) 874-2256

Crab Mechanical Services Inc
621 3rd Street

AAA Heating and Air Cond.
340 Amos Newsome Ln
Virgie, KY 41572
(606) 639-6860

American Heating & Cooling
P. O. Box 4321
Pikeville, KY 41502
(606) 639-4307

**Ar-iron Heating & Air
Conditioning**
2744 Roberts drive
Ashland, KY 41101
(606) 920-9700

Big Sandy Heating & Cooling
P. O. Box 330
Hager Hill, KY 41222
(606) 297-4328

Breathliff Plumbing & Heating
1261 Main Street
Jackson, KY 41339
(606) 666-4313

C & H Heating & Air Conditioning
P. O. Box 946
Flatwoods, KY 41139
(606) 833-1995

**Caldwell Heating & Air
Conditioning**
9630 Grandview Lake Road
Ashland, KY 41102
(606) 928-3618

Coleman Heating & Cooling
P. O. Box 580
Regina, KY 41559
(606) 754-5763

Cullop's Heating & Cooling
P. O. Box 2637

Adams Heating & Cooling
P. O. Box 719
Delbarton, WV 25670
(304) 475-3878

Appalachian Mfg & Cooling
P. O. Box 4141
Pikeville, KY 41502
(606) 422-5643

Ashland Furnace
2700 Winchester Avenue
Ashland, KY 41101
(606) 325-3211

Blanton Heating & AC
135 Railroad Street
Dwale, KY 41621
(606) 874-0130

Breeding's Plumbing & Electric
P. O. Box 86
Isom, KY 41824
(606) 633-5961

C.N.C. Services
895 Nebo Road
Cattlettsburg, KY 41129
(606) 686-2298

Castle Heating & Cooling
5917 Bybee Road
Ashland, KY 41102
(606) 928-1148

Cox Commercial
149 Clover lane
Greenup, KY 41144
(606) 473-1016

Delta Supply Heating & Cooling
455 Hambley Blvd.

Portsmouth, OH 45662
(740) 355-5300

Dils & Company
2359 Town Mountain Road
Pikeville, KY 41501
(606) 437-4609

Elliott Supply & Glass, Inc.
P. O. Box 3038
Pikeville, KY 41502
(606) 437-7368

Frederick & May Lumber & Supply
P. O. Box 218
West Liberty, KY 41472
(606) 743-3136

Grayson Mechanical HVAC
405 Robert & Mary Street
Grayson, KY 41143
(606) 474-4550

HCE Systems Inc.
P. O. Box 879
Norton, VA 24273
(276) 679-5829

Huff's HVAC
P. O. Box 547
Cornettsville, KY 41731
(606) 476-2942

Kentucky Wide Htg & Clg
P.O. Box 384
Thelma, KY 41260
(606) 424-5684

Maggard's Heating & Cooling
140 County Line Branch
Garrett, KY 41630
(606) 358-2466

Mooney's Heating & Cooling
P. O. Box 1313
Inez, KY 41224

Williamson, WV 25661
(606) 237-4823

East Hills Heating & Cooling
P. O. Box 135
Ivel, KY 41642
(606) 226-4593

**Fannin's Plumbing Heating
& Electric Company, Inc.**
432 Main Street
Paintsville, KY 41240
(606) 789-3696

G & W Heating & Cooling
273 Paul Road
Wurtland, KY 41144
(606) 922-8402

Griffith Plumbing & Heating
338 Broadway
Jackson, KY 41339
(606) 666-2316

HELP Air Conditioning & Htg
731 E. Main St.
Grayson, KY 41143
(606) 475-0826

Imperial Heating & Cooling
P.O. Box 526
Ashland, KY 41105
(606) 324-0610

Lafferty Heating & Cooling
P. O. Box 208
Dwale, KY 41621
(606) 874-9357

Marco Heating & Cooling
P. O. Box 585
Hyden, KY 41749
(606) 672-2431

Mulvaney & Son's Inc.
P. O. Box 368
Catlettsburg, KY 41129

Pikeville, KY 41501
(606) 432-0787

Elite Comfort HVAC Inc
8192 KY 1261
Campton, KY 41301
(606) 272-7141

Fletcher Services
1572 Ratliff Creek Rd
Pikeville, KY 41501
(606) 433-1151

**General Heating & Air
Conditioning**
P. O. Box 964
Flatwoods, KY 41139
(606) 836-8143

Haiton Heating & Cooling
69 Beagle Road
Whitesburg, KY 41858
(606) 632-2790

Howard's Heating & Air
P. O. Box 569
Baxter, KY 40806
(606) 573-2944

KB HVAC
145 Shady Creek
Greenup, KY 41144
(606) 923-7534

Mabry's Heating & Cooling
2423 Greenbriar Rd
Olive Hill, KY 41164
(606) 286-6007

Miller's Heating & Cooling
3752 Stone Coal Rd
Pikeville, KY 41501
(606) 432-9599

Patterson Repair Services, Inc.
4264 Marsh Hill Dr
Catlettsburg, KY 41129

(606) 298-4784

Pike's Heating & Cooling
490 Steerfork Road
Mallie, KY 41836
(606) 785-9430

**Randy Suffles General
Construction**
208 Miranda Lane
Grayson, KY 41143
(606) 474-9286

Roy's Electric Repair
4802 Roberson Road
Ashland, KY 41101
(606) 833-8019

Shelton Heating & Air
560 Shelton Dr.
Eolia, KY 40826
(606) 632-9542

Tennell Refrigeration
157 One Mile Branch
Hyden, KY 41749
(606) 672-5252

Tony's Electrical HVAC
P. O. Box 228
Melvin, KY 41650
(606) 452-4394

Tri-State Heating & cooling
P. O. Box 65
Banner, KY 41603
(606) 874-5472

(606) 739-4042

Praffs Heating & Cooling
317 Upper Doty Branch
Happy, KY 41746
(606) 476-9690

Ray Brown Inc.
726 National Ave.
Lexington, KY 40502
(859) 278-0281

Scurlock Heating & Cooling
1005 Woodland Drive
Paintsville, KY 41240
(606) 788-9188

Stone's Heating & Refrigeration
P. O. Box 82
Regina, KY 41559
(606) 432-3912

Thompson Heating & AC
6858 Mockingbird Trail
Catlettsburg, KY 41129
(606) 739-6880

Tri-County Heating & Air
P. O. Box 108
Salysersville, KY 41465
(606) 349-2308

Webb's Heating & Cooling
P. O. Box 146
Lowmansville, KY 41232
(606) 673-3050

(606) 571-1715

**Quality Air Conditioning &
Heating**
P. O. Box 751
Pound, VA 24279
(276) 796-5366

Roosevelt's Heating & Cooling
26595 Highway 32
Martha, KY 41159
(606) 652-4972

Service Incorporated
800 Old Flemingsburg Road
Morehead, KY 40351
(606) 784-4918

**Smith Heating, Cooling &
Electric**
P. O. Box 1594
Hazard, KY 41702
(606) 439-4874

Todds Refrigeration
456 Pine Frk
Shelbyanna, KY 41562
(606) 437-5320

Tri-County Heating & Air
P. O. Box 108
Salysersville, KY 41465
(606) 349-2283

Williams Electric
P. O. Box 635
Salysersville, KY 41465
(606) 349-1234

Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
argraves@aep.com

Joseph Chambers
Contractor
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kivass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrnicek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com


The logo for AEP (American Electric Power) is displayed in white text on a dark, textured rectangular background.

Evaluation Report

Kentucky Power Company Mobile Home New Construction

Evaluation Report for 2009-2010

July 2011

A dark, textured horizontal bar is located at the bottom of the page, extending across most of the width.

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	6
Summary	6
Promotional Effectiveness.....	6
Delivery Mechanism	6
Data Tracking.....	6
Free Riders and Spillover	7
Market Potential	7
Customer Satisfaction	8
Impact Evaluation	9
Impact Results.....	11
Cost Effectiveness Evaluation.....	12
Prospective Analysis	14
Recommendations.....	15
References	16
Appendix - Impact Methods and Assumptions	17
Impact Methods.....	17
Technology Description	17
Algorithms	18
Terms	18
Validation Rules	18
Assumptions.....	18
Appendix - Exhibits.....	19
Exhibit 1 - Fact Sheet	19
Appendix - Survey	20
Appendix - Mobile Home Dealers	23
Appendix - EE/DR Analytics Team Members	25
Load Research.....	25
EE and Consumer Programs.....	25
Marketing.....	25

Executive Summary

The Kentucky Power Company (KPC) Mobile Home New Construction (MHNC) program is designed to lower energy usage in new mobile homes by paying incentives to mobile home dealerships and the customers who purchased a new mobile home with a high efficiency heat pump and a Zone 3 insulation package. Kentucky Power Company's MHNC Program was designed as a market transformation program with a goal to promote the awareness of, and to increase the penetration of, high efficiency heat pumps and to improve the insulation levels in new mobile homes. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. For 2009 and 2010, the MHNC program helped upgrade 412 customer heat pumps, providing 692 MWh of net annualized energy savings, 188 kW of summer peak demand reductions, and 101 kW of winter peak demand reductions. The process evaluation concluded that the promotion and delivery processes continue to be effective.

Based on the results of the evaluation, the MHNC program was determined to be cost-effective for three of the cost-benefit tests used in the California Standard Practice Manual and KPC should continue to utilize the program through the remainder of the current program life (2011). The prospective analysis of the program for 2012-2014 predicts the program will be cost-effective and should be continued.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio	Winter Peak Ratio
Program Administrator Cost (PACT)	1.92	1.67
Total Resource Cost (TRC)	2.58	2.25
Ratepayer Impact Measure (RIM)	0.61	0.53
Participant Cost (PCT)	3.66	3.66

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	1.78
Total Resource Cost (TRC)	2.64
Ratepayer Impact Measure (RIM)	0.60
Participant Cost (PCT)	3.84

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Kentucky Mobile Home New Construction program was developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on December 4, 1995 (Case No. 95-427) to help meet Kentucky Power's goals.

The major goals of the program are to:

- 1) Transform the mobile home market towards high efficiency heat pumps and better insulation.
- 2) Reduce customer usage of electric energy
- 3) Increase customer satisfaction and services
- 4) Reduce Kentucky Power's long-range peak demand.

The Mobile Home New Construction Program (MHNC) was designed to transform the market for new mobile homes within the KPC service territory and to determine the energy implications of current (1996) design and installation practices. The MHNC Program, initiated by the Kentucky DSM Collaborative, has been operating in the KPC service area since 1996. Since this program is considered fully developed, not much attention will be paid to the program description.

Process and Market Evaluation

Summary

The Program has been in place since 1996, and therefore a detailed review of the basic program processes was deemed unnecessary. Rather, the primary concern related to the process and market evaluation was whether the program continues to influence purchasing decisions or whether the market has been fully transformed to the point where all new mobile homes would normally be equipped with high-efficiency heat pumps without the program. Review of mobile home dealer information indicates mobile homes can still be purchased in Kentucky with heating systems other than high-efficiency heat pumps. The 2011 survey of participants indicated that 50% of the participants would likely have purchased an equivalent mobile home, thus it can be inferred that the program still influenced the decision making of 50% of the home purchasers. The promotion methods employed and the delivery mechanism continue to be effective.

Promotional Effectiveness

KPC implemented the program through a network of participating mobile home dealerships. The dealers provided each potential buyer a brochure describing the program. Dealer participation was critical to the success of the program. KPC relied entirely on its network of dealers to promote the program. This promotional method is likely the most effective available, as KPC has no other cost-effective way to reach out to potential buyers of new mobile homes.

Delivery Mechanism

The sales representative at the dealer explained the program to the customer and provided them with the brochure (Appendix) which also described the program, and explained the incentive offered for purchasing a new mobile home with a high efficiency heat pump and upgraded Zone 3 insulation package. The dealers provided the Company with customer installation reports from which incentive payments were made to the dealers and customers. KPC employees entered the information into an Excel spreadsheet for participant tracking. KPC was able to deliver this program with minimal KPC staff overhead expenses.

Data Tracking

A number of problems were found when examining the data tracking efforts of KPC staff. Many pieces of data were missing that are required to produce engineering estimates for Air Source Heat Pumps. Specifically, each customer must have the baseline/replacement and new Heating Seasonal Performance Factor (HSPF), Seasonal Energy Efficiency Rating (SEER), Energy Efficiency Rating (EER), size in tonnage or British thermal unit hours (BtuH) for every customer. The baseline measure is the equivalent

to what measure would have been installed without the program. Even though the program only deals with new construction, the engineering estimates must be compared to some other item, either what already exists (replacement), or what would have existed (baseline). The implementation data for this program excluded all baseline information, and there were no data related to the EER of the heat pumps. Without EER, accurate demand estimates cannot be made. There was also no information regarding the Zone 3 insulation package, so it was excluded from the impact evaluation. In addition, 13 customers could not be located at all in implementation data, but were listed in the monthly participation summary in the Collaborative Report.

Finally, the participation spreadsheet used by KPC to calculate ex ante savings using the last evaluation contained an incorrect application of free ridership. The previous evaluation calculated the Net annualized per-participant energy savings at 2,073 kWh. In the spreadsheet, this number was listed as the gross savings. Free ridership was then re-applied to the net number and used for ex ante estimates. This resulted in a 17% loss of savings in documents filed with the Collaborative.

Free Riders and Spillover

A free rider is a participant who purchased a mobile home with the high-efficiency heat pump system, but would have purchased the same home had they not participated in the Program. Spillover refers to additional energy efficiency measures adopted by participants as a result of the program. Free ridership was determined by dividing the total survey responses by the positive responses to the questions "Had you planned on upgrading the heat pump before you heard about the program?" and "Would you have installed upgraded the heat pump if the program was not available?" From the survey responses, 49% of participants indicated they would have purchased the same home without the program and thus were classified as likely free riders in this program. No information on possible spillover effects was captured in the survey.

Market Potential

The 2010 Residential Customer Survey showed that about 30% of the new mobile homes placed in KPC service territory in the past five years were not equipped with heat pumps. These figures include the effect of the increased heat pump saturation due to the program. Although heat pumps are in the majority of new mobile homes being sold in the KPC service area, there is still potential to continue influence the market.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was very high, with 92% of the survey respondents indicating they were very satisfied (56%) or satisfied (36%) with the program overall, and 95% indicating they were very satisfied (62%) or satisfied (33%) with the mobile home dealer. Only one person expressed dissatisfaction with the program (the other customers not classified as satisfied had no opinion), and from the comments received that dissatisfaction appeared to be related to some color issues with some panels and improperly stretched carpet, items that had no relation to KPC's program itself.

Impact Evaluation

The evaluation began with an engineering estimate analysis of the implementation data collected by KPC. The engineering estimates were used to develop gross measure savings without post-consumption data or a billing analysis. A billing analysis was not performed because no pre-implementation billing data is available. To effectively capture the change in usage patterns, the evaluation needs both pre- and post-billing data. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. For Net-To-Gross calculations, survey results provided a basis for net savings estimates.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. Once a valid set of customers was determined, the next step was to use the engineering estimate algorithm for Air Source Heat Pumps (Appendix – Impact Methods and Assumptions) to determine an average per-participant energy, summer peak, and winter peak savings value. To calculate annualized energy savings, an average per-measure savings must be determined based on the heating and cooling savings from the increased efficiency of the heat pump. Heating savings are determined by the inverse difference of the Heating Seasonal Performance Factors (HSPF) between the baseline heat pump and the increased efficiency heat pump. Cooling savings are determined by the inverse difference of the Seasonal Energy Efficiency Rating (SEER) between the baseline and upgraded heat pumps. Each savings value is scaled based on the size of the heat pump by tonnage or British Thermal Unit Hours (BtuH) to determine the per-participant, per-year usage. The per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. Because the MHNC program is a market transformation program, we expect the free ridership to increase every year, as the dealers begin to offer fewer alternatives to the heat pump. At the previous evaluation, free ridership was found to be 17% of participation. This iteration of the evaluation, the free ridership increased to 31%, as expected. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings should be as follows

2009 and 2010 Average Net Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
Per-Participant Savings	1,681	0.455	0.101

For 2009, KPC had goals of upgrading 185 customers with higher efficiency heat pumps and saving KPC customers 318 MWh, 107 kW in winter peak demand and 130 kW in summer peak demand savings. The program was able to upgrade 208 participants, and produce net annualized total program savings of

350 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized winter peak demand reductions were 51 kW and the net annualized summer peak demand reductions were 95 kW. KPC met 112% of the participant target, 110% of the energy target, 47% of the winter demand target, and 73% of the summer demand target.

For 2010, KPC had goals of upgrading 170 customers with higher efficiency heat pumps and saving KPC customers 293 MWh, 99 kW in winter peak demand and 119 kW in summer peak demand savings. The program was able to upgrade 204 participants, and produce net annualized total program savings of 343 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized winter peak demand reductions were 50 kW and the net annualized summer peak demand reductions were 93 kW. KPC met 120% of the participant target, 117% of the energy target, 50% of the winter demand target, and 78% of the summer demand target.

For the years 2009 and 2010 of the MHNC program, KPC was able to upgrade 412 customers, producing net annualized program savings of 692 MWh of energy savings, 10 kW in winter demand and 188 kW in summer demand peak reductions. As a whole, KPC was able to meet 116% of the participant target, 113% of the energy target, 49% of the winter demand target, and 75% of the summer demand target.

Participation and annual energy savings numbers were near the expected goals; however, the summer and winter demand savings were lower than expected. The reasons for lower numbers are two-fold. First, unavailable information in the data collected led to inaccurate estimates. The Air Source Heat Pump algorithm requires EER to accurately estimate demand savings. Because EER was not available, SEER and HSPF had to be used, which can undervalue demand savings. Second, the participant survey results showed that free ridership was higher than the previous evaluation. However, increased free ridership is expected in market transformation programs.

Impact Results

The four key statistics used in an impact evaluation – number of participants, energy savings, summer peak demand reduction, winter peak demand reduction – are shown below. Included in the table are the program goals, the *ex-ante* savings, and the *ex-post* savings. *Ex-ante* savings are forecasted savings as reported by the program staff during the program's implementation. *Ex-post* savings are estimated savings as determined by the impact evaluation and reported in the evaluation report.

Impact Evaluation Results by Year

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	185	208	208	112%
Energy (MWh)	318	358	350	110%
Summer Demand (kW)	130	146	95	73%
Winter Demand (kW)	107	121	51	47%
2010				
Participants	170	204	204	120%
Energy (MWh)	293	351	343	117%
Summer Demand (kW)	119	143	93	78%
Winter Demand (kW)	99	119	50	50%
Total				
Participants	355	412	412	116%
Energy (MWh)	611	709	692	113%
Summer Demand (kW)	249	288	188	75%
Winter Demand (kW)	206	239	101	49%

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects. Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). In addition to the tests, costs of conserved energy will be calculated from the utility perspective. Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. ~~Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included for recovery purposes, unless new labor was utilized incrementally and specifically for DSM program implementation.~~

The expenditure goal for 2009 in the Collaborative Report was \$101,750 for 185 participants. The total program costs as filed were \$104,700 of which \$95,000 were listed as incentives for 208 participants. However, these costs do not include the unrecoverable administrative costs from KPC staff and AEPSC staff. An estimated \$7,000 was included under administration to account for unrecoverable costs, bringing the total to \$111,700 in actual costs related to the program. The expenditure goal for 2010 in the Collaborative Report was \$93,500 for 170 participants. The total filed program costs were \$127,200, of which \$115,500 were incentives for 204 participants. To account for unrecoverable admin costs and the costs from the 2010 evaluation of 2009 activity, another \$7,000 and \$10,000 were added to account for admin and evaluation costs respectively. The costs per-participant was also higher in each year (not including admin). The estimated cost per participant in the Collaborative Report was \$550, and the actual costs per-participant was \$563.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analysis attempted to account for all costs related to program implementation and evaluation. Therefore an estimate of the

value of KPC and AEP Service Corporation (AEPSC) staff time utilized to implement and evaluate the program was added to the reported costs. The below table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	Total
2009	\$7,000	\$9,450	\$95,000	\$250	\$111,700
2010	\$7,000	\$11,450	\$115,500	\$250	\$134,200
2011	\$-	\$-	\$-	\$10,000	\$10,000

Goals were reported as total amounts respective to the winter peak only, however, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP generation pool that experiences summer peaking conditions, and winter to account for KPC's maximum system load that occurs in the winter.

The results for the benefit/cost tests show that the program was cost-effective from Participant, Program Administrator, and Total Resource perspectives, although each ratio underperformed compared to projections in the program filing. The expected Total Resource Cost ratio was 3.66, Participant Cost ratio was 3.46, Ratepayer Impact Measure ratio was 2.59, and Program Administrator Cost ratio was 3.75. Contributing factors for the decline include an increase in free ridership, higher cost per participant, and unaccounted for participants due to lack of data.

2009 and 2010 Summer Peak Cost Effectiveness Analysis

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.92	\$ 225,232	\$ 470,462	\$ 245,230
Total Resource Cost (TRC)	2.58	\$ 287,998	\$ 470,462	\$ 182,464
Ratepayer Impact Measure (RIM)	0.61	\$ (304,310)	\$ 470,462	\$ 774,772
Participant Cost (PCT)	3.66	\$ 519,667	\$ 715,102	\$ 195,435

2009 and 2010 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.67	\$ 165,093	\$ 410,323	\$ 245,230
Total Resource Cost (TRC)	2.25	\$ 227,859	\$ 410,323	\$ 182,464
Ratepayer Impact Measure (RIM)	0.53	\$ (364,449)	\$ 410,323	\$ 774,772
Participant Cost (PCT)	3.66	\$ 519,667	\$ 715,102	\$ 195,435

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, there will be any changes to the cost effectiveness of the program in future years. Any number of a multitude of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the MHNC program, results from the current evaluation were used as the starting point for the cost-benefit analysis. Future savings values were discounted due to the nature of the program being a market transformation program. A higher free ridership value was included in the prospective analysis, from 31% to 40%. However, the lower annualized energy savings due to increased free ridership is offset by an increase in the cost of avoided energy in future years.

Due to the closeness of the 2009 and 2010 cost benefit analysis, only the winter peak cost benefit analysis was run. The results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective.

2012-2014 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.78	\$ 272,254	\$ 620,754	\$ 348,500
Total Resource Cost (TRC)	2.64	\$ 385,433	\$ 620,754	\$ 235,321
Ratepayer Impact Measure (RIM)	0.60	\$ (417,170)	\$ 620,754	\$ 1,037,924
Participant Cost (PCT)	3.84	\$ 754,954	\$ 1,020,639	\$ 265,685

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the MHNC program.

- 1) Results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective. It is our recommendation that this program be continued.
- 2) Greater scrutiny should be applied to data collection and tracking. Every customer list should have at a minimum, the customer's utility bill account number in the same format as it is stored in the CIS, the install date of the measure (handout date), and the HSPF, SEER, EER, and BtuH for both the installed measure, and the baseline measure. It is best practices to always include what measures were installed, and what measures would have been there had the program not been in place.

- 3) Future costs should be captured in a more organized and delineated manner. ~~Each program~~ should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.
- 4) On-going program management should be handled by KPC staff, including tracking of customer participation and estimated ex-ante savings.
- 5) KPC staff labor time spent on the Program should be captured so that the true total cost of delivering the program can be known.
- 6) Program participants should be surveyed shortly after the rebate is processed.
- 7) KPC should gather information from the dealers about customers that were interested in the program but declined to participate. Using that information, KPC should then sample the customer list and perform a non-participant survey to find any reasons for non-participation.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.
- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual: Ohio TRM - Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.
- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template. Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline. MS Excel Workbook. 20 May 2010.
- VII. AEP Load Research Analysis Evaluation Report for the Mobile Home New Construction Program in Kentucky Power Company Program Period: January 2006 - December 2007. October 2008.
- VIII. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- IX. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- X. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XI. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix - Impact Methods and Assumptions

Impact Methods

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long-term savings from the specific installations.

Technology Description

A heat pump is a high efficiency year-round heating and cooling system operating entirely on electricity. The system is called a heat pump because it pumps or moves heat from one area to another. The basic components of a heat pump are a compressor; circulating fluid (refrigerant); and two heat exchangers, one outside and one inside. In winter, heat is extracted from cold outdoor air even when the temperature is well below freezing. The heat is absorbed by the refrigerant, and then is pumped through the compressor to the indoor coil (heat exchanger) where the refrigerant releases its heat to the indoor air. Since there is less heat available at low outdoor temperatures, the heat pump system includes a supplemental resistance heater that automatically provides additional heat when the outdoor air temperature is too low for the heat pump compressor to supply the home's total heating demand. In the summer, the heat is absorbed by the refrigerant in the indoor coil from the circulating indoor air. The heat-laden refrigerant from the indoor coil is pumped to the outdoor coil where the heat is transferred to the outdoor air. The heat pump system is the most efficient way to heat and cool electrically. The most significant energy savings are obtained during the heating season since it utilizes the "free" heat that already exists in the outdoor air. The heat pump energy efficiency is determined by the seasonal energy efficiency ratio (SEER) for summer and the heating seasonal performance factor (HSPF) for winter.

Algorithms

$$kWh = \left[\left(FLH_{cool} \times \frac{BtuH}{1000} \times \left(\frac{1}{SEER_{base}} - \frac{1}{SEER_{ee}} \right) \right) + \left(FLH_{heat} \times \frac{BtuH}{1000} \times \left(\frac{1}{HSPF_{base}} - \frac{1}{HSPF_{ee}} \right) \right) \right]$$

$$kW = \frac{\left(BtuH \times \left(\frac{1}{EER_{base}} - \frac{1}{EER_{ee}} \right) \right)}{1000} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
FLH _{cool}	Full Load Cooling Hours by closest weather related large city
FLH _{heat}	Full Load Heating Hours by closest weather related large city
BtuH	Size of equipment in British Thermal Unit Hours
SEER _{base}	SEER efficiency of baseline unit
SEER _{ee}	SEER efficiency of installed unit
HSPF _{base}	Heating Season Performance Factor for baseline unit
HSPF _{ee}	Heating Season Performance Factor for installed unit
EER _{base}	EER efficiency of baseline unit
EER _{ee}	EER efficiency of installed unit
CF	Coincidence Factor

Validation Rules

Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis (or the end of the measure's expected life).
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Free Ridership	31%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%
Measure's expected life in years	15
Fully Loaded Cooling Hours	1,150
Fully Loaded Heating Hours	1,975
Summer Coincidence Factor	0.7
Winter Coincidence Factor	0.5

Appendix – Exhibits

Exhibit 1 – Fact Sheet

DEP KENTUCKY POWER
A Unit of American Electric Power

Mobile Home New Construction Program
Fact Sheet


Program Overview

If you are thinking about purchasing a new mobile home, Kentucky Power can help you make a smart energy choice with the Mobile Home New Construction Program. This program is designed to help you offset the cost of improvements to your new home's insulation and heating and cooling systems, giving you greater savings, comfort and value for years to come.

With the Mobile Home New Construction Program, we provide a \$500 incentive to mobile home buyers who purchase a new home with zone 3 insulation levels and a high efficiency heat pump.

Insulating your home properly is a good way to reduce energy costs. Insulation zone levels refer to the energy code/r-value climate zone map that addresses insulation requirements specified by the U.S. Department of Energy. Regions across the U.S. are placed into specific "climate zones." These zones help code officials and building designers to determine the level of insulation required within specific regions. While Kentucky is technically in zone 2, the upgrade to zone 3 provides a buffer to extreme weather conditions, and keeps more heat in during the winter, and out during the summer.

Typically, new mobile homes have heating and cooling systems consisting of electric central furnace and a central air conditioning unit. Upgrading to a heat pump is a very efficient and economical way to heat and cool your home using electricity. Simply put, a heat pump is an air conditioner that is able to reverse cycle to provide heating. It is a wise energy investment for homeowners that can help reduce your monthly electric bills without sacrificing comfort.



Customer Eligibility

All Kentucky Power residential customers are eligible to participate.

How to Participate

Call our Customer Solution Center at 1-800-572-1113 or contact a participating manufactured home dealer.

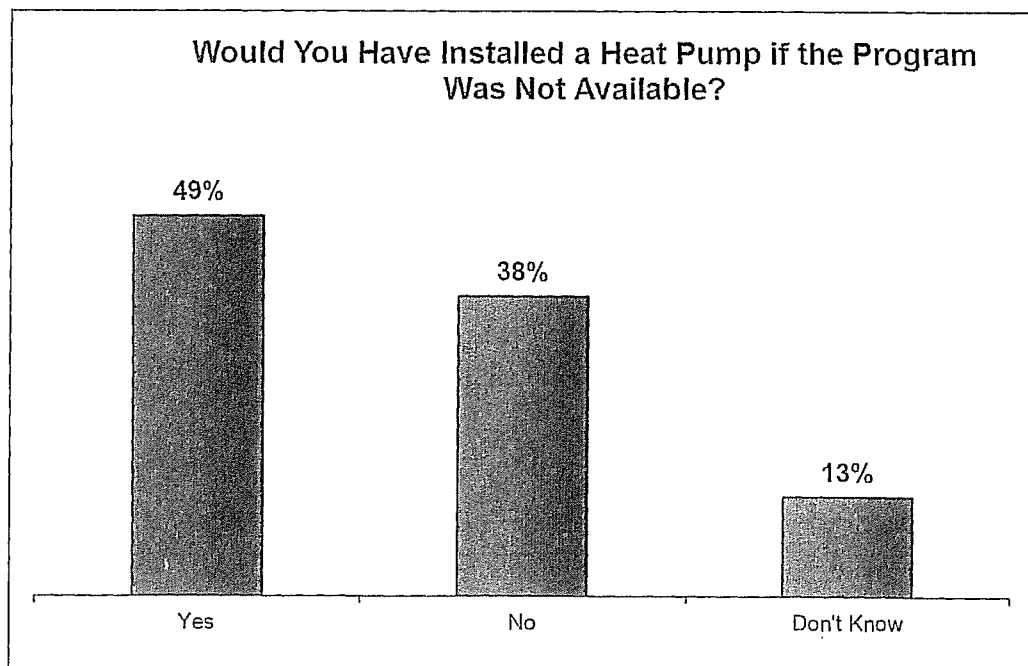
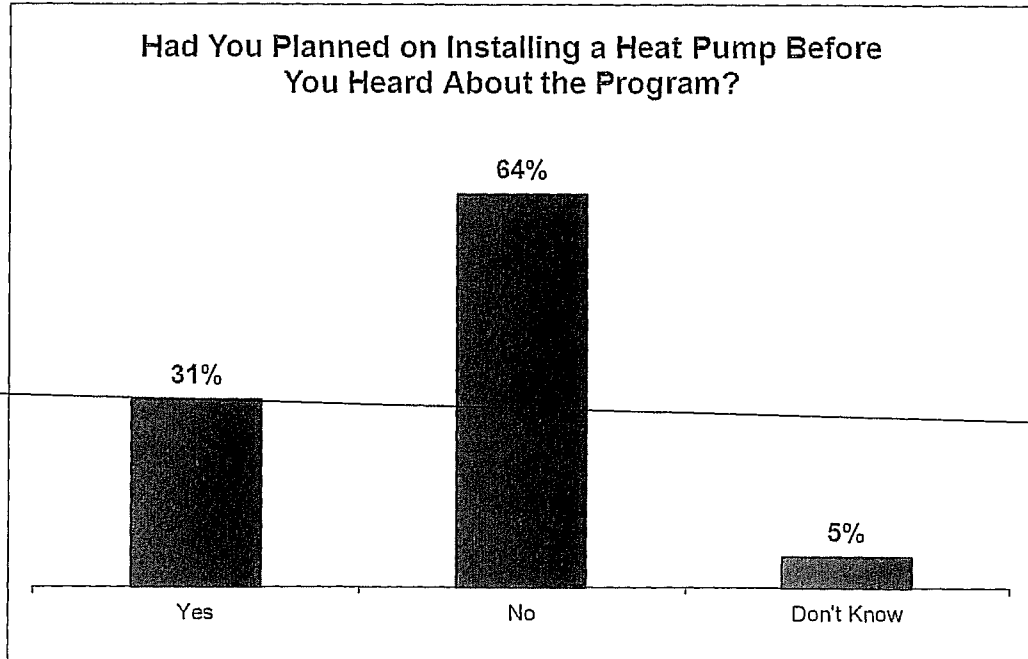
Other Opportunities

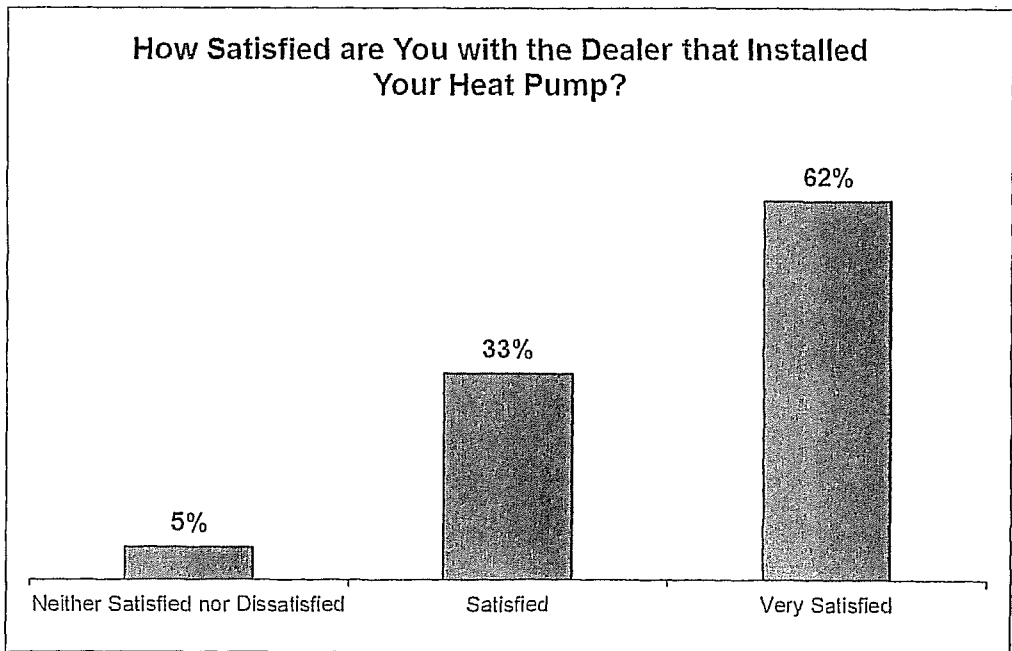
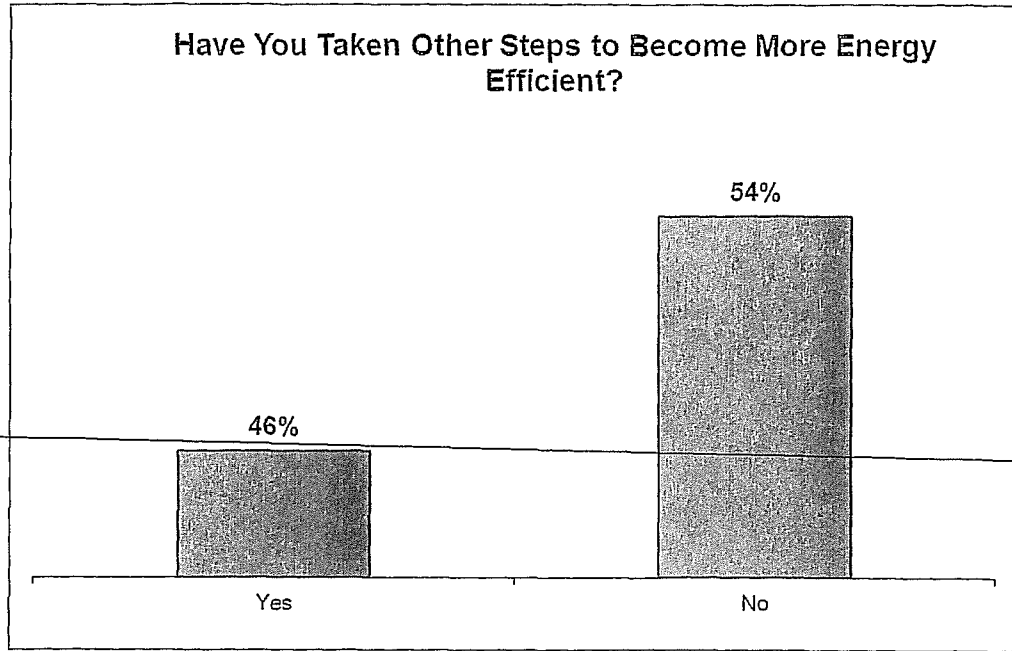
The Mobile Home New Construction Program is part of Kentucky Power's suite of SMART Programs, which are energy efficiency programs for homes, businesses and schools. For more information on this program or other SMART Programs, call 1-800-572-1113 or visit KentuckyPower.com/save.

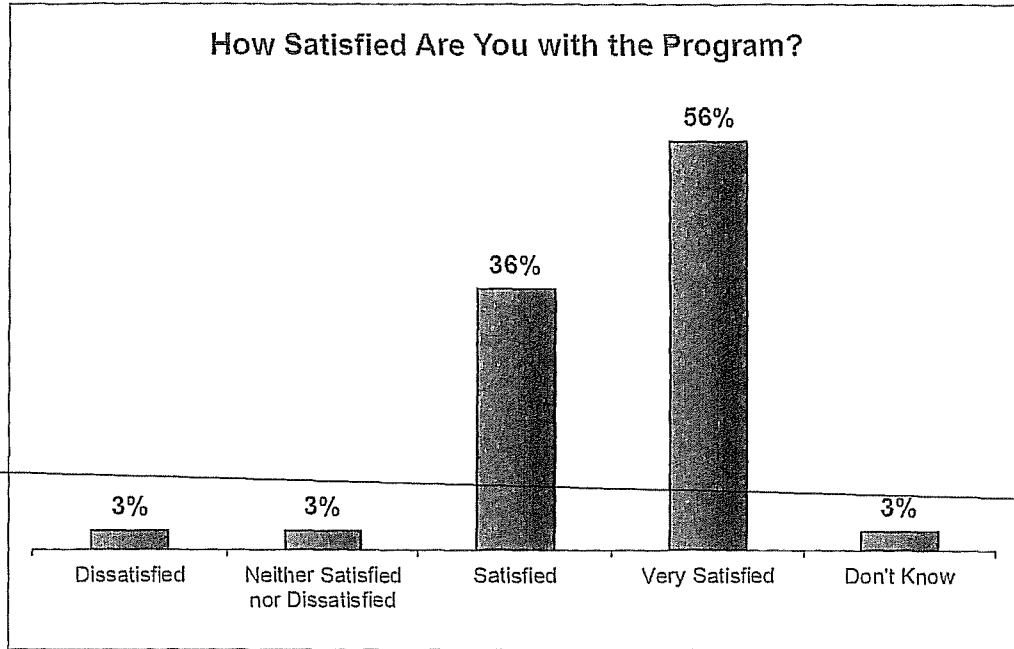
SMART Programs – Saving Money And Resources Together[®]

grid SMART
From Kentucky Power

Appendix – Survey







Appendix – Mobile Home Dealers

A & L Homes, Inc.
P O Box 331
Flemingsburg, KY 41041

Barker's Mobile Homes
7641 US 321 South
Hager Hill, KY 41222

Best Buy Homes
P. O. Box 2707
Pikeville, KY 41502

Bluegrass State Home Showcase
P O Box 223
Banner, KY 41603

Brown's Mobile Homes
P. O. Box 476
765 North Carol Malone Blvd
Grayson, KY 41143

By-Pass Mobile Homes
1595 Maysville Rd
Flemingsburg, KY 41041

~~**Cheap's Mobile Housing, Inc.**
P. O. Box 348
Flemingsburg, KY 41041-0348~~

~~**Clayton Homes**
12658 U S Hwy 23 S
Harold, KY 41635~~

~~**Clayton Homes**
State Route 1947 Box 404
Grayson, KY 41143~~

Clayton Homes
917 Morton Blvd.
Hazard, KY 41702

Clayton Homes
10409 Orby Cantrell Hwy
Pound, VA 24279

Doug Dawson Mobile Homes
745 Mt. Sterling Rd
Flemingsburg, KY 41041

Doyle Mobile Homes
KY 11 North, Maysville Rd
Flemingsburg, KY 41041

Dream Homes Mobile Home Sales
580 C. W. Stevens Blvd.
Grayson, KY 41143

Dream Mobile Homes Inc.
P. O. Box 360
331 Fitz Gilbert Rd
Hazard, KY 41701

Edgewood Homes
1530 US Highway 25 E
Middlesboro, KY 40965

Fleetwood Home Center
208 Kentucky Ave.
Norton, VA 24273

Freedom Homes
13121 Stone Court
Ashland, KY 41102

George Humfleet Homes
PO Box 189
London, KY 40743

Glenn's Finer Homes
615 Kentucky Avenue
Norton, VA 24273

Grayson Mobile Homes, Inc.
P. O. Box 8
1090 N State Hwy 7
Grayson, KY 41143

Greenup Home Sales
499 St. Rt. 503
Greenup, KY 41144

Home Show of Ashland
13135 State Route 180
Ashland, KY 41102

Horizon Homes
P. O. Box 437
5115 Kent Junction Rd
Norton, VA 24273

Hylton Sales & Rentals, LLC
P. O. Box 203
Ivel, KY 41642

Jerry Adkins Mobile Home Sales
2741 U. S. 23 South
Pikeville, KY 41501

Lakeside Homes, Inc.
42 Jetts Drive
Jackson, KY 41339

LUV Homes
P. O. Box 105
4840 S US 23
Ivel, KY 41642

Mountain Homes, Inc.
775 Mountain Parkway Spur
Campton, KY 41301

Oakwood Homes
P. O. Box 897
24 Loftis Tipple Rd
Belfry, KY 41514

Oakwood Homes
17151 Highway 23
Louisa, KY 41230

Premium Homes
P. O. Box 2404
Middlesboro, KY 40965

White Hall Mobile Homes, Inc.
171 Citizens Lane
Hazard, KY 41701

Osborne Mobile Homes
41 Piney Point Way
Ulysses, KY 41264

Rainbow Homes
P. O. Drawer 232
Paintsville, KY 41240

Paradise Mobile Homes
1464 Hwy 15 North
Jackson, KY 41339

The Home Show of Barboursville
5898 Route 60 East
Barboursville, WV 25504

Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
aragraves@aep.com

Joseph Chambers
Contractor
614-716-3372 phone
614-716-3388 fax
jchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kjvass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrnicek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com





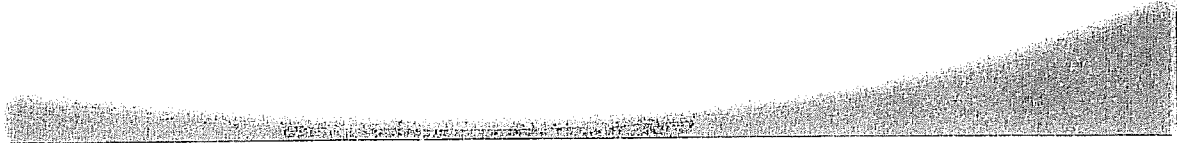
Evaluation Report

Kentucky Power Company

Modified Energy Fitness

Evaluation Report for 2009-2010

July 2011



Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	6
Summary	6
Promotional Effectiveness.....	6
Delivery Mechanism	6
Data Tracking.....	7
Free Riders and Spillover	8
Market Potential	8
Customer Satisfaction	8
Impact Evaluation	9
Impact Results.....	9
Cost Effectiveness Evaluation.....	10
Prospective Analysis	13
Recommendations	14
References	15
Appendix – Impact Analysis and Methods.....	16
Impact Methodology	16
Billing Analysis	16
Analysis Results	20
Analysis Graphs.....	21
Control Group Analysis.....	23
Appendix - Engineering Estimates	24
Estimation Methodology	24
Technology Description	25
Validation Rules	29
Program Assumptions	29
Appendix – Exhibits	30
Exhibit 1 – Fact Sheet.....	30
Appendix – Survey	31
Appendix – EE/DR Analytics Team Members	34
Load Research.....	34
EE and Consumer Programs.....	34
Marketing.....	34

Executive Summary

The Kentucky Power Company (KPC) Modified Energy Fitness (MEF) program is designed to promote conservation and efficient use of electricity by improving the "energy fitness" of electrically heated residences. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. For 2009 and 2010, the impact analysis showed that the MEF program weatherized 2,001 homes, providing 1,304 MWh of net annualized energy savings, and 480 kW of winter peak demand reductions. Load growth in the amount of 60 kW occurred in the summer, most likely due to snap back. The process evaluation concluded that the promotion and delivery processes were effective but can be improved greatly to target homes that are more suited for weatherization.

Based on the results of the evaluation, the MEF program was cost-effective for only one of the cost-benefit tests used in the California Standard Practice Manual, and only at winter peak. In addition, the prospective analysis of the program for 2012-2014 predicts the program could be cost-effective. It is recommended to extend the program beyond 2011, for one to two years, and have a new impact analysis completed which will ensure the billing analysis models were not underspecified. A positive recommendation for program continuation is predicated if the next impact analysis includes detailed demographic data for all KPC residential customers and positive cost-benefit test results for at least three of the winter cost-benefit tests. Below are the cost-benefit results for the program.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio	Winter Peak Ratio
Program Administrator Cost (PACT)	0.62	0.90
Total Resource Cost (TRC)	0.80	1.15
Ratepayer Impact Measure (RIM)	0.32	0.46
Participant Cost (PCT)	N/A	N/A

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	1.07
Total Resource Cost (TRC)	1.37
Ratepayer Impact Measure (RIM)	0.55
Participant Cost (PCT)	N/A

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Kentucky Modified Energy Fitness program was developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on September 24, 2002 (Case No. 2002-00304) to help meet Kentucky Power's goals.

Since 2003, the MEF program has provided services to thousands of customers. Under the terms of the contract with the implementation contractor, Honeywell International, KPC pays for in-home audits and weatherization services for KPC all-electric customers. MEFP was developed to promote conservation and efficient use of electricity by improving the "energy fitness" of electrically heated residences. The major goals of the program are:

-
- 1) Reduce customer usage of electricity for space heating
 - 2) Reduce customer usage of electricity for water heating
 - 3) Encourage customers to use energy efficient measures
 - 4) Increase customer service and satisfaction
 - 5) Educate customers on using high efficiency measures
 - 6) Reduce the Company's long-range peak demand.

To achieve the MEFP goals the program is offered to residential customers in the KPC service territory who have an electric heating system and an electric water heater who have a minimum average monthly usage of at least 1,000 kWh.

Honeywell promoted the MEFP through a direct mail brochure on KPC letterhead, which describes the program by explaining all of the services provided, and that Honeywell will contact the customer directly and arrange a time for the audit at the customer's residence. Customers are targeted by zip code.

Process and Market Evaluation

Summary

The Program has been in place for many years, and therefore a detailed review of the basic program processes was deemed unnecessary. Rather, the primary concern related to the process and market evaluation was whether the program continues to effectively save energy. The 2011 survey of participants indicated that 27% of participants would likely have purchased similar energy efficiency measures without the program. Most promotions were handled by Honeywell, and the method employed was effective. The delivery mechanism is effective, though could use improvement. Customer satisfaction was very high.

~~*Promotional Effectiveness*~~

KPC has traditionally promoted the program solely through Honeywell. Recently, KPC staff updated the Kentucky Power website and created a program fact sheet to help with promotion. Participation results were near KPC's expected goals, so it is assumed the promotional work done is effective.

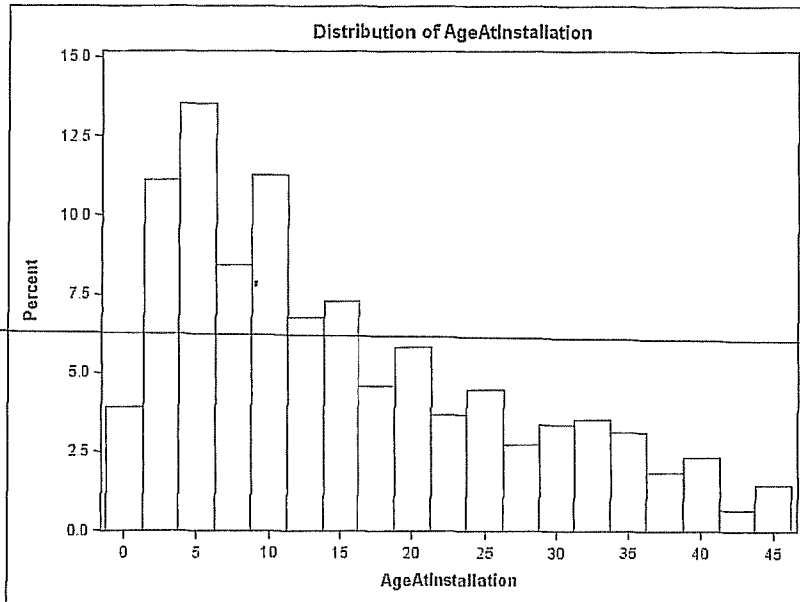
Delivery Mechanism

Honeywell is responsible for implementing the MEF program, performing on-site audits, providing the customer a report from the audit, and performing measure installations at the customer's home. Honeywell provided KPC with customer installation reports once per month. KPC staff monitors participant and expenditure reports monthly, and pays invoices to Honeywell. Audits were performed by KPC staff to verify the measures were installed and align with invoices from Honeywell. KPC personnel perform a quarterly audit to inspect installation of measures. Honeywell only utilized two (2) crews for implementation of the program until recently when a third crew was added, which led to a geographic concentration of the installations. This may lead to some over or under estimation of the impact analysis due to the homogenization of the participating customers. Honeywell also surveyed KPC management to ascertain their performance with the program. Follow-up meetings were conducted with Honeywell and KPC personnel to evaluate survey results and recommendations for improvement.

This evaluation was the second consecutive evaluation to find that the billing analysis did not support the validity of previous energy savings values used. The root cause of the disagreement appears to be the same as the previous evaluation indicated, mainly, that the mechanism for choosing participants is selecting homes to weatherize that do not extract the most savings from the measures installed. The median age of the homes weatherized was 12 years; with 25% of the homes being 6 years or younger at

the time of installation. The following chart shows a detailed histogram of the age of the homes, indicating that many homes weatherized were newer homes.

Histogram of Home Age at Time of Installation



Data Tracking

As a whole, data collection and tracking was performed adequately from Honeywell's perspective. However, the exchange of data between Honeywell and AEP is very troublesome. The Honeywell data files are stored in an antiquated file format and do not align with any of AEP's common solution platforms. If Honeywell wishes to transfer the data using cbase, its current format (a normalized database snowflake-schema), then they must transfer the data to a tool approved by AEP, such as SAS, Microsoft Access, Oracle, SQL Server, or DB2. If they cannot provide the data in one of those formats, then the data must be de-normalized into a star-schema and provided in a spreadsheet or CSV file.

Sporadic pieces of data were missing that are required to produce engineering estimates. Discrepancies in the participation tracking spreadsheet led to underestimating demand savings by 61% in Collaborative reports. This was most likely due to not having up-to-date summer and winter demand per participant savings numbers from the last two evaluations. Even without up-to-date estimates, the spreadsheet chose an older, and lower, per participant estimate which led to underreporting of 2009

summer program kW savings by 21 kW and winter demand savings by 103 kW. Demand savings from 2010 were reported correctly.

Free Riders and Spillover

A free rider is a participant who installed energy efficiency measures had they not participated in the Program. Spillover refers to additional energy efficiency measures adopted by participants as a result of the program. Free ridership was determined by dividing the total survey responses by the positive responses to the questions "Had you planned on installing any weatherization measures before you heard about the program?" and "Would you have installed weatherization measures if the program was not available?" From the survey responses, 27% of participants indicated they would have installed some measures without the program. No information on possible spillover effects was captured in the survey.

Market Potential

At this time, the market potential for weatherization appears good. Participation goals should continue at levels comparable to previous years. However, a larger market potential could be found if program participants were not limited to customers with electric water heating. The majority of savings available to participants comes from other measures and participation should not be prohibited. In addition, more time and effort should be spent to ensure that customers that are marketed to would actually benefit from the weatherization. More emphasis should be placed on weatherizing older homes, or manufactured and mobile homes.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was very high, with 85% of the survey respondents indicating they were very satisfied (33%) or satisfied (52%) with the program. One respondent was very dissatisfied and three were dissatisfied. From the comments received the source of the dissatisfaction was the recent KPC rate increase and an installer cracking a door.

Impact Evaluation

The MEF evaluation consisted of a billing analysis coupled with engineering estimates of the implementation data collected by KPC. The billing analysis was used to determine net savings by participant. The engineering estimates were used to develop gross measure savings by participant. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. To effectively capture the change in usage patterns, an evaluation needs both pre- and post-installation billing data. The per-participant billing analysis savings are compared to the per-participant engineering estimates to determine an estimated Net-to-Gross ratio. In theory, the billing analysis results should capture the free ridership and spillover behaviors of participant group. Those results are then compared to the survey results to see if the free ridership and spillover questions asked corroborate the analysis. Further details of the billing analysis and engineering estimates can be found in the appendixes.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. Once a valid set of customers was determined, the next step was to perform a billing analysis and create engineering estimates using the algorithms for installed measures (Appendix – Engineering Estimates) to determine an average per-participant energy, summer peak, and winter peak savings value. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings are in the below table; the billing analysis savings results should be used until such time as KPC has had an opportunity to reevaluate the program.

2009 and 2010 Average Net Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
Per Participant Savings	651	-0.030	0.240

Impact Results

For 2009, KPC had goals of weatherizing 800 homes and saving KPC customers 696 MWh, 127 kW in summer peak demand, and 402 kW in winter peak demand. The program weatherized 801 homes. The billing analysis showed that the program produced net annualized total program energy savings of 522 MWh, including transmission and distribution losses, persistence, and free ridership, net winter peak demand reductions of 192 kW, and a net summer peak demand increase of 24 kW.

For 2010, KPC had goals of weatherizing 1,200 homes and saving KPC customers 1,044 MWh, 190 kW in summer peak demand, and 603 kW in winter peak demand. The program weatherized 1,200 homes. The billing analysis showed that the program produced net annualized total program energy savings of

782 MWh, including transmission and distribution losses, persistence, and free ridership, net winter peak demand reductions of 288 kW, and a net summer peak demand increase of 36 kW.

The summer demand growth shown in the billing analysis is most likely attributable to snap back. In instances where customers are living below their level of comfort, a potential for energy savings will not result in realized energy savings but will instead produce an increase in energy usage so that the customer can live closer to their desired comfort level. As an example, if a customer would prefer a residence cooled to 74 degrees in the summer, but can only afford 76 degrees, when presented with monetary savings from a reduced bill will move their thermostat to 74 degrees, rather than retain their lower bills.

The reasoning for the lower energy and winter demand savings in respect to the expected goals was due to not having a completed billing analysis in previous evaluations. Engineering estimates for most measures rely on averages calculated across the entire United States and in all types of structures. The estimates can vary greatly from what actually occurs at the participant's home. Because of the large variation, and reduction, in annualized energy savings estimates, 20 control groups were ran against the sample to ensure as much uncertainty could be reduced.

Impact Evaluation Results by Year for MEF Customers – Billing Analysis

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	800	801	801	100%
Energy (MWh)	696	697	522	75%
Summer Demand (kW)	127	127	(24)	-19%
Winter Demand (kW)	402	402	192	48%
2010				
Participants	1,200	1,200	1,200	100%
Energy (MWh)	1,044	1,044	782	75%
Summer Demand (kW)	190	190	(36)	-19%
Winter Demand (kW)	603	603	288	48%
Total				
Participants	2,000	2,001	2,001	100%
Energy (MWh)	1,740	1,741	1,304	75%
Summer Demand (kW)	316	317	(60)	-19%
Winter Demand (kW)	1,005	1,005	480	48%

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects. Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure

test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included for recovery purposes, unless new labor was utilized incrementally and specifically for DSM program implementation.

The expenditure goal for 2009 in the Collaborative Report was \$304,000 for 800 participants. The total program costs as filed were \$302,864 of which \$258,977 were listed as incentives for 997 participants. However, these costs do not include the unrecoverable administrative costs from KPC staff and AEPSC staff. An estimated \$7,500 was included under administration to account for unrecoverable costs, bringing the total to \$310,364 in actual costs related to the program. The expenditure goal for 2010 in the Collaborative Report was \$480,000 for 1,200 participants. The total filed program costs were \$418,693, of which \$358,022 were incentives for 1,198 participants. To account for unrecoverable admin costs and the costs from the 2011 evaluation, another \$7,500 was included for 2010 and \$20,000 was added in 2011 to account for admin and evaluation costs respectively.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analysis attempted to account for all costs related to program implementation and evaluation. Therefore an estimate of the value of KPC and AEP Service Corporation (AEPSC) staff time utilized to implement and evaluate the program was added to the reported costs. The below table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	Total
2009	\$7,500	\$43,887	\$258,977	\$-	\$310,364
2010	\$7,500	\$60,671	\$358,022	\$-	\$426,193
2011	\$-	\$-	\$-	\$20,000	\$20,000

Goals were reported as total amounts respective to the winter peak only, however, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP generation pool that experiences summer peaking conditions, and winter to account for KPC's maximum system load that occurs in the winter. Results were lower than expected, and disconcerting. It is expected that prospective benefit cost ratios for some programs will be overestimated, sometimes wildly, due to the sunny disposition and uncertain nature of market potential studies, however previous results were higher due to using engineering estimates instead of a billing analysis to determine energy savings. Because of the lower numbers, 20 control groups were run and compared to ensure uncertainty in the model was reduced as much as possible. In addition, all customers that had usage levels outside of the 95% confidence level were discarded as potential outliers.

Program goals were to have a Program Administrator Cost (PACT) ratio of 3.37, a Total Resource Cost (TRC) ratio of 3.37, and a Ratepayer Impact Measure (RIM) ratio of 1.43. Due to no costs being borne by the participants, the Participant Cost (PCT) ratio of is not applicable. The results of the billing analysis show that the program was only cost effective for the TRC test at winter peak.

2009 and 2010 Summer Peak Cost Effectiveness Analysis

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	0.62	\$ (274,063)	\$ 450,187	\$ 724,250
Total Resource Cost (TRC)	0.80	\$ (114,192)	\$ 450,187	\$ 564,379
Ratepayer Impact Measure (RIM)	0.32	\$ (970,509)	\$ 450,187	\$ 1,420,696
Participant Cost (PCT)	N/A	\$ 1,274,458	\$ 1,274,458	\$ -

2009 and 2010 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	0.90	\$ (74,873)	\$ 649,377	\$ 724,250
Total Resource Cost (TRC)	1.15	\$ 84,998	\$ 649,377	\$ 564,379
Ratepayer Impact Measure (RIM)	0.46	\$ (771,319)	\$ 649,377	\$ 1,420,696
Participant Cost (PCT)	N/A	\$ 1,274,458	\$ 1,274,458	\$ -

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, there will be any changes to the cost effectiveness of the program in future years. Any number of a multitude of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the MEF program, results from the current evaluation were used as the starting point for the cost-benefit analysis. The results were expected to be higher due to an increase in the cost of avoided energy in future years. Due to KPC being a winter peaking utility, only the winter peak cost benefit analysis was run. Results for the program are presented for both the billing analysis and the engineering estimates. ~~The results of the billing analysis show that the program will not be cost effective~~ for any of the applicable tests in 2012-2014.

2012-2014 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.07	\$ 82,316	\$ 1,319,448	\$ 1,237,132
Total Resource Cost (TRC)	1.37	\$ 355,102	\$ 1,319,448	\$ 964,346
Ratepayer Impact Measure (RIM)	0.55	\$ (1,058,986)	\$ 1,319,448	\$ 2,378,434
Participant Cost (PCT)	N/A	\$ 2,052,359	\$ 2,052,359	\$ -

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the MEF program.

- 1) It is our recommendation that this program should be continued for one to two years and an additional impact analysis and customer selection evaluation be completed.
 - 2) Demographic data from Acxiom or an equivalent vendor is recommended for purchase representing all KPC customers in the AEP CIS so that accurate control groups can be drawn for the proposed impact analysis. Current costs for the approximately 143,000 KPC residential customers are estimated at \$12,000.
 - 3) KPC should re-examine their participant selection methods. Too many customers in newer and well-sealed homes are being weatherized, spending funds that could be used on less efficient and older homes and gaining greater energy and demand savings.
-
- 4) Future costs should be captured in a more organized and delineated manner. Each program should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.
 - 5) On-going program management and oversight should continue to be handled by KPC staff, including tracking of customer participation and estimated ex-ante savings.
 - 6) KPC staff labor time spent on the Program should be captured so that the true total cost of delivering the program can be known.
 - 7) KPC should randomly survey a handful of participants to determine if the Honeywell crews are providing objective audit advice. Each participant should be surveyed twice, once for post-audit/pre-installation, and again post-installation to determine if the savings expected from the audit's recommendations are corroborated.
 - 8) KPC staff should continue to perform on-site installation audits for a small sample of participants.
 - 9) Honeywell and KPC staff should continue with scheduled program reviews and monthly conference calls to continue improving their working relationship.
 - 10) KPC should consider adding another employee to help with in-the-field audits, ride-along trips and other general work required with the MEF and other programs.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.
- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual, Ohio TRM – Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.

- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template, Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline. MS Excel Workbook. 20 May 2010.
- VII. AEP Load Research Analysis Evaluation Report for the Modified Energy Fitness Program in Kentucky Power Company Program Period: January 2006 – December 2007. October 2008.
- VIII. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- IX. Mohr, Lawrence B. Impact Analysis For Program Evaluation. 2nd Ed. 1995
- X. The SAS Institute. The EXPAND Procedure. http://support.sas.com/documentation/cdl/en/etsua/60372/HTML/default/viewer.htm#expand_toc.htm
- XI. DeBoor, Carl (1981), A Practical Guide to Splines, New York: Springer-Verlag.
- XII. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- XIII. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XIV. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix – Impact Analysis and Methods

Impact Methodology

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long-term savings from the specific installations.

Billing Analysis

Impact evaluation consists of two stages, interim impact evaluation and full impact evaluation. Engineering estimates are used to develop measure savings without post-consumption data. Implementation data is utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. The full impact evaluation consists of a billing analysis. This analysis utilizes relevant weather data and billing data with the statistical regression models to determine the savings impact of the program. A comparison of customers' bills before and after the implementation of the program is used to determine changes in usage and demand that can be attributed to the program. In order to isolate the effects of the program from unassociated changes in consumption, a Participant Group and a distinct but similar Control Group is compared. The Control Group will not contain program participants, but its customers will be similar in consumption to the program participants. After defining these research groups, billing data is weather-normalized to eliminate any effects due to weather differences before and after program implementation. Finally, regression models will be used to analyze the normalized data and provide savings values.

The first step of the billing analysis is to create a valid participant list from which to analyze. Each customer is checked to ensure that data existed for at least one year pre and post measure installation. Participants were also required to have data for all of 2008 to develop a set of comparison metrics for drawing the control group. Any customers that did not have the requisite billing data, or were inactive at the time of analysis, were discarded from analysis.

For 2009, the implementation data provided showed that 997 customers participated. 305 customers were not found in the AEP Customers Information System (CIS) at all. In all, 692 customers were

available for analysis. In 2010, after validation, 102 customers were not in the AEP CIS; leaving 1,096 customers available for analysis. In total there were 1,788 customers in the implementation data that were valid for analysis. From those, more customers were rejected if their average per month usage was below 1,000 kWh.

After the participant list was created, a set of energy statistics was developed to compare to the control group. For each customer, an annual kWh, summer peak month kWh, and winter peak month kWh (formulas below) were calculated using 2008 billing data. KPC summer and winter peaks were pulled from the AEP Load Research system peak data and applied to each customer bill that contained that date, and was used to create a summer and winter monthly energy value.

Formula for determining comparison statistics between participant and control group

$$kWh_{annual} = 365 \times \frac{\sum kWh_per_Bill}{\sum Days_per_Bill} \quad kW_s = 31 \times \frac{kWh_per_Bill_s}{Days_per_Bill_s} \quad kW_w = 31 \times \frac{kWh_per_Bill_w}{Days_per_Bill_w}$$

After participant group selection is complete, the KPC population is validated to provide a list of potential control group customers. The population is usually constrained by one or more of program class (residential, C&I, etc...), building characteristics (single-family, mobile home, etc...), fuel type (all electric, natural gas, etc...), and income level (HEAP, non-HEAP, all). Customers are removed from consideration if they are not continuously active from January 1, 2008 until current. After the control population has been validated, comparison statistics are calculated using the above formulas.

After the control population group has been established, and both the control population's and participant group's comparison statistics have been calculated, the control population's customers are compared to the participants to provide a baseline comparison. Each participant customer is matched to all control population customers, and the top 150 most accurate matches are kept for further analysis. Matching is determined by calculating an Absolute Relative Deviation (ARD) for the Annual kWh, summer kWh, and winter kWh comparison statistics. The customers with the lowest combined ARD are kept for further validation. Due to the variance of the participant usage in the MEF program, many participants had to be rejected from further analysis because a valid control group could not be established. For each of the 150 control customers, they are assigned the same installation date as the participant customer. Each of the 150 customers is then validated using the same pre/post rules as the participant customers. Each control customer must have at least one year of data pre and post the pseudo-installation of the measure. Following pre-post validation, the 95%

confidence level is determined and the customers falling outside of the range were eliminated as outliers.

Formula for comparing control population customer to participant

$$ARD = ARD_{kWha} + ARD_{kWhs} + ARD_{kWhw}$$

$$ARD_{kWha} = \frac{|kWha_{ctrl} - kWha_{part}|}{kWha_{ctrl}} \quad ARD_{kWhs} = \frac{|kWhs_{ctrl} - kWhs_{part}|}{kWhs_{ctrl}} \quad ARD_{kWhw} = \frac{|kWhw_{ctrl} - kWhw_{part}|}{kWhw_{ctrl}}$$

After the 150 customers have been compared to the participant, the top 20 are kept for further evaluation. Twenty control groups are used for comparison because of the variance of the population. The population variance is high because the AEP CIS does not contain enough demographic data on the customer to create a very accurate regression model. There are too many lurking variables in a billing analysis if enough data is not included, which can bias the results. Once the 20 control groups have been selected, each group is run, pairwise, with the participant group through the entire billing analysis process. Final results for each run of the analysis are compared to ensure that none of the control groups are extreme in either direction (load savings or load growth). Using an alpha of .05 for Type I error testing, and a beta of .10 for Type II, or power testing, checks are completed to ensure that the control group methodology is valid. Once the methodology is verified, the first control group, being the most accurate, is used for the regression portion and official savings calculations. If there are concerns about uncertainty, all 20 control groups will be run and the numbers will be aggregated as a replicated analysis. For the MEF program, all 20 control groups were run.

The regression analysis is conducted by constructing two models, a baseline and treatment weather normalized panel model. A panel analysis is a two-dimensional time-series and cross-sectional model used to evaluate changes in the effects of a treatment on a treatment group compared to a control group over time. Weather Normal, or Typical Meteorological Year, data is created by the U.S. National Renewable Energy Laboratory (NREL) to represent weather data for a typical year. The TMY2 dataset was used for all KPC billing analysis, and is derived from the 1961-1990 National Solar Radiation Data Base (NSRDB).

The baseline model is created using at least one year of billing data pre-installation to develop a weather normalized billing function (see formula below). The treatment model is created using at least

one year of billing data post-installation. Each customer is assigned a weather station, average daily temperature, cooling degree day, and heating degree day summaries to each bill. Degree days are calculated by summing the number of hours per day by the degrees per hour above or below a temperature break point. For heating degree days, the breakpoint temperature is set at 65 degrees Fahrenheit. Cooling degree days are calculated using 70 degrees Fahrenheit as the breakpoint. Once the necessary data has been created, an autoregressive model is fit to the data for each customer to create the betas necessary to predict data. Each beta represents the multiplier coefficient for the incremental value of each model variable. To forecast or estimate new kWh, multiply the regression betas by the new data.

Weather normalized regression model

$$kWh = (\beta_{daily_kwh} \times Days) + (\beta_{ADT} \times ADT) + (\beta_{CDD} \times CDD) + (\beta_{HDD} \times HDD) + (\beta_{CDD^2} \times CDD^2) + (\beta_{HDD^2} \times HDD^2) + \epsilon$$

Once the baseline and treatment models have been determined, the model betas are multiplied by weather normal data to create baseline weather normalized bills for each customer. Once the bills have been forecasted, the data is aggregated to create annualized normal energy usage per customer. Each customer has an estimated baseline and treatment annualized kWh. The difference between the estimated baseline and treatment kWh is the energy savings due to the program. The annualized energy estimates are then summarized by participant group and control group, and multiple t-tests are completed to compare the savings of each group, and their pairwise difference.

Once the annualized savings numbers have been calculated, the forecasted bills are used to create monthly and daily load shapes for DSMore. The monthly load shape is created by temporally disaggregating the bills from a cycle month to a calendar month. Traditional load research techniques use linear interpolation method of determining an average energy usage per day per bill, then creating a stepped daily load shape. This method maintains transformation under integration, meaning one can move from cycle month to billing month without loss of accuracy; however the ability to detect peaks using this method is very limited. The second method, utilized in this evaluation, is to create a daily load shape using cubic splines. This method is also closed under integration, and is the preferred method for temporal disaggregation when using SAS (Statistical Analysis Software®). AEP Load Research has done studies comparing the accuracy of both methods in predicting daily load shapes of interval metered customers, and found that the cubic spline disaggregation is more accurate when using goodness-of-fit statistics. However, the primary reason for using cubic splines is the ability to put more load on the peak days of the month. Using the cubic spline method, the forecasted bills are disaggregated to a 365 day daily load shape for each customer. Using the daily load shape, the customers are aggregated using

traditional load research methods, to determine a domain load shape. For the MEF program, there were no domains below the program level.

Next, the peak day history for KPC is used to create a typical peak day for both the summer and winter peak. This is done by averaging the day per year for each year to determine the average day-per-year. As an example, if the last five winter peaks occurred between January 11th and January 15th, it is expected that the average day-per-year peak day will be January 13th. After the typical peak date for the summer and winter peaks has been determined, the KPC Residential Load Research class load shape, as determined by AEP Load Research, is retrieved for each peak date. Using the Residential class load shape, the proportion of energy used at the peak hour, relative to the total energy for the day is determined as a load factor. To determine the summer and winter peaks, the daily energy from the cubic spline disaggregation is divided by the load factor and 24 (hours per day) to determine the average peak demand reduction for each season. The formula is below:

Peak demand reduction formulas

$$kW_s = \frac{kWh_{peakdayS}}{24} / LF_s \qquad kW_w = \frac{kWh_{peakdayW}}{24} / LF_w$$

Analysis Results

The below graphs contain the summary panel, profile plot, and agreement plot from SAS, created during the PROC TTEST procedure. Particular attention should be paid to the uncertainty of the parameter estimate for the mean. Because of the uncertainty involved in the model, any savings estimate within the Lower Confidence Level (LCL) and Upper Confidence Level (UCL) is within plus or minus two standard errors of the mean. What this means is that the findings of the billing analysis show that the neither of the previous evaluation savings estimates, nor the current engineering estimate, are statistically different from the *ex post* savings estimate to the 95% confidence level.

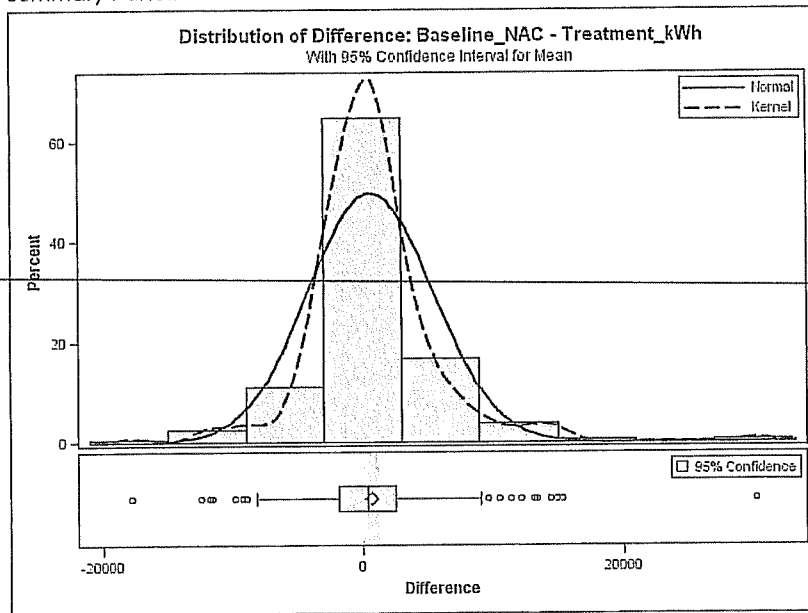
All twenty control groups were ran and aggregated. A cursory glance of the control group baseline and treatment comparisons show extreme variability. Had only one control group been run, the model could have found a load growth of 245 kWh or a high savings as 527 kWh. Running multiple iterations of the billing analysis allows us to take advantage of the Central Limit Theorem and create a better estimate of the per participant savings. Control group variation numbers are presented after the charts and graphics.

Summary Statistics: All Customers

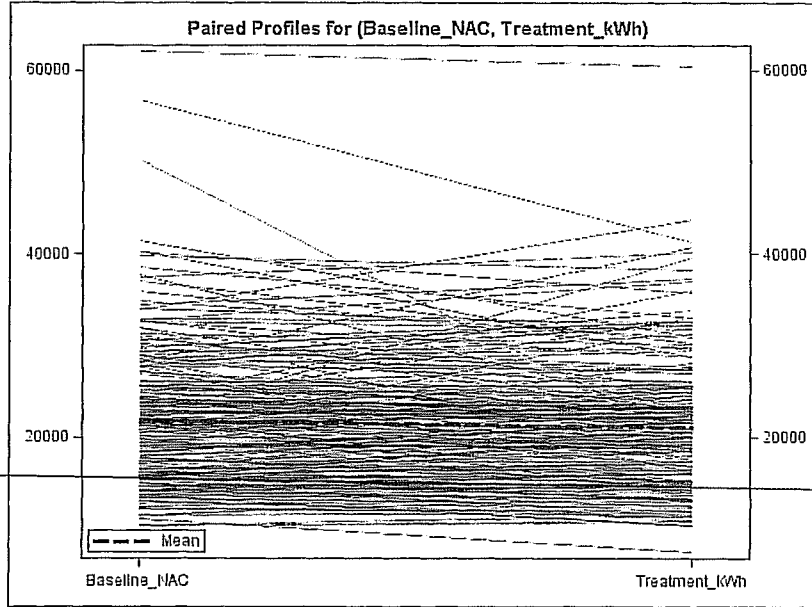
N	Mean	Std Dev	Std Err	95% CL Mean	Summer kW	Winter kW
235	651.4	4,818.8	314.3	32.1 1,270.7	-0.030	0.240

Analysis Graphs

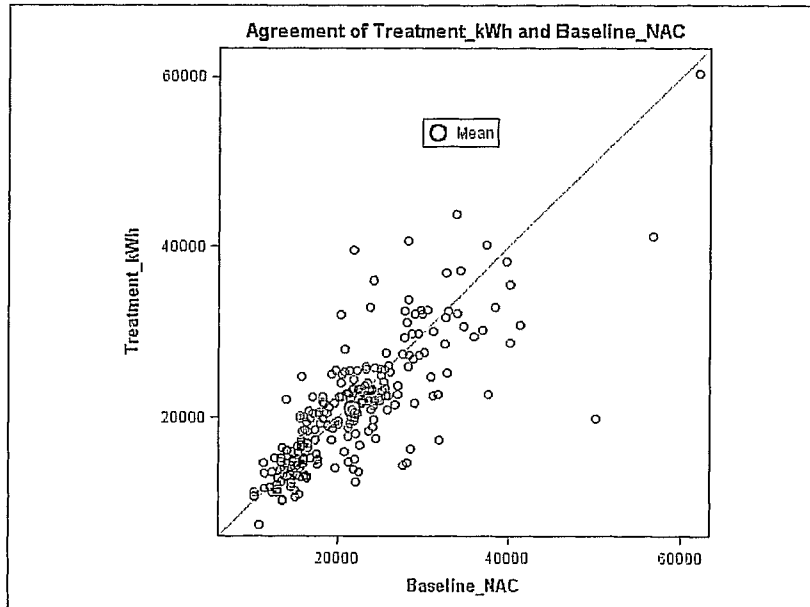
Summary Panel:



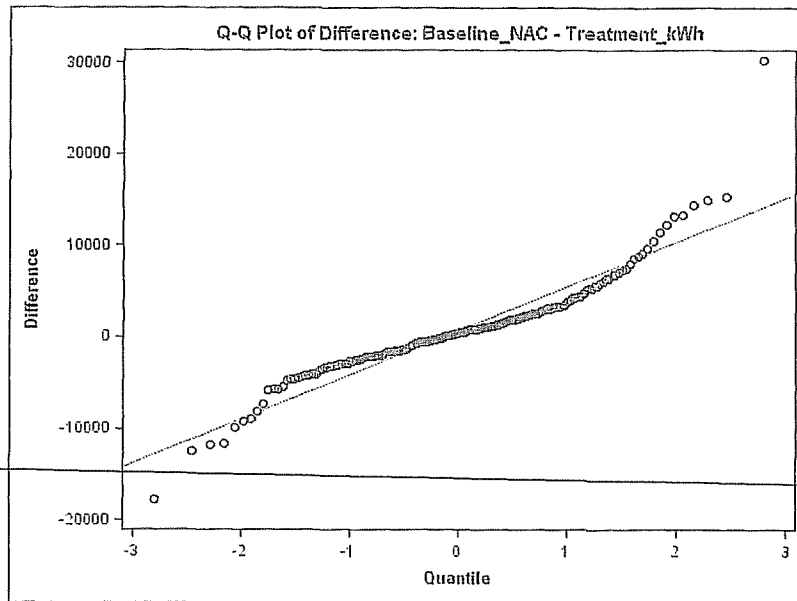
Profile Plot:



Agreement Plot:



Q-Q Plot:



Control Group Analysis

When performing a billing analysis to determine the impacts for program evaluation, the participant group needs to be matched to a set of control customers. For historical analyses, the literature suggests a single control group be matched to the participant list in order to provide a valid set of customers from which to compare. This is done to remove any activities that are related to free ridership: i.e. those activities that would have occurred without the program. However, this author feels that without a robust set of demographic data to make customers comparisons more accurate than AEP's current CIS contains, a billing analysis must treat the control group selection as a replication of quasi-experimental designs. Quasi-experimental design, or "before and after" design, is distinguished by the non-randomness of the control and participant selection groups. However, given the limited demographic data, we substitute the rigorous selection with an increase in replications. Classical statistics (sometimes called Frequentist statistics) is predicated on the notion of repeated trials to infinity, e.g. the relative frequency of a statistics as the trials near infinity. However, in practice, most statistics that is performed is done using a single repeated trial. In many cases, and disciplines, this is an accepted, even celebrated practice. However, in impact analysis of programs, the usage uncertainty and disparity of customer demographics at a premise (number televisions, HVAC usage, work schedule, occupants, etc....) demands that more than one replication be undertaken. Below is the list of control groups generated for this analysis and how each iteration would have compared to the per participant savings calculated in the billing analysis.

Control Group Comparison to Per Participant kWh

Analysis Group	Baseline Mean	Treatment Mean	Ratio	Per Participant kWh if Chosen	Loss/Gain From Mean
Control_01	22,181	21,676	97.73%	855	204
Control_02	21,505	20,833	96.88%	665	13
Control_03	21,684	20,845	96.13%	497	(154)
Control_04	21,274	20,871	98.11%	941	290
Control_05	20,595	20,363	98.87%	1,114	462
Control_06	20,973	20,368	97.11%	718	66
Control_07	21,494	20,971	97.57%	820	169
Control_08	21,896	21,456	97.99%	914	263
Control_09	21,442	21,668	101.05%	1,603	952
Control_10	21,349	20,121	94.25%	74	(578)
Control_11	21,682	20,526	94.67%	169	(483)
Control_12	21,256	20,147	94.78%	194	(458)
Control_13	21,968	20,831	94.82%	203	(448)
Control_14	21,214	20,841	98.24%	971	320
Control_15	21,292	20,512	96.34%	543	(108)
Control_16	20,968	20,282	96.73%	632	(20)
Control_17	22,092	21,362	96.69%	624	(28)
Control_18	20,830	19,996	96.00%	467	(184)
Control_19	21,880	20,928	95.65%	388	(263)
Control_20	20,876	20,219	96.85%	659	7

Appendix - Engineering Estimates

Estimation Methodology

To calculate annualized energy savings, an average per-measure savings must be determined based on the heating and cooling savings from the increased efficiency of the heat pump. Heating savings are determined by the inverse difference of the Heating Seasonal Performance Factors (HSPF) between the baseline heat pump and the increased efficiency heat pump. Cooling savings are determined by the inverse difference of the Seasonal Energy Efficiency Rating (SEER) between the baseline and upgraded heat pumps. Each savings value is scaled based on the size of the heat pump by tonnage or British Thermal Unit Hours (BtuH) to determine the per-participant, per-year usage. The per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. This number is compared to the billing analysis values to see if the survey free ridership and spillover questions are comparable to the analytically determined values.

Technology Description

ENERGY STAR CFL Bulbs

Description

A low wattage ENERGY STAR qualified compact fluorescent screw-in bulb (CFL) is purchased through a retail outlet in place of an incandescent screw-in bulb. The incremental cost of the CFL compared to the incandescent light bulb is offset via either rebate coupons or via upstream markdowns. Assumptions are based on a time of sale purchase, not as a retrofit or direct install installation. This characterization assumes that the CFL is installed in a residential location. Where the implementation strategy does not allow for the installation location to be known and absent verifiable evaluation data to support an appropriate residential versus commercial split, it is recommended to use this residential characterization for all purchases to be appropriately conservative in savings assumptions.

Algorithms

$$kWh = \frac{(W_{base} - W_{replace})}{1000} \times (H \times 365) \times (1 + IF)$$

$$kW = \frac{(W_{base} - W_{replace})}{1000} \times CF \times (1 + IF)$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
W _{base}	Wattage of bulb being removed
W _{replace}	Wattage of bulb being installed
H	Average Daily hours-of-use
IF	Interactive Factor
CF	Coincidence Factor

Assumptions:

The expected measure life is 8 years.

Air Sealing

Description

This measure characterization is for the improvement of a building's air-barrier, which together with its insulation defines the thermal boundary of the conditioned space. Air-leakage in buildings represents

from 5% to 40% of the space conditioning costs but is also very difficult to control. The measure assumes that a trained auditor, contractor or utility staff member is on location, and will measure and record the existing air leakage rate and post air-sealing leakage using a blower door, and the efficiency of the heating and cooling system used in the home.

Algorithms

$$kWh = \frac{\left(\frac{(CFM50_{Exist} - CFM50_{New})}{Nfactor} \times 60 \times CDH \times DUA \times 0.018 \right)}{1000 \times \eta_{Cool}}$$

$$kW = \frac{\Delta kWh}{FLH_{cool}} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
CFM50 _{exist}	Existing cubic feet per minute at 50 Pascal pressure differential as measured by the blower door before air sealing
CFM50 _{new}	New cubic feet per minute at 50 Pascal pressure differential as measured by the blower door after air sealing
Nfactor	Conversion factor to convert 50 Pascal air flows to natural airflow
60	Constant to convert cubic feet per minute to cubic feet per hour
CDH	Cooling Degree Hours
DUA	Discretionary Use Adjustment to account for the fact that people do not always operate their air conditioning system when the outside temperature is greater than 75°F
0.018	The volumetric heat capacity of air
η _{Cool}	Efficiency of Air Conditioning equipment
FLH _{cool}	Full load cooling hours
CF	Coincidence Factor

Assumptions

The expected measure life is 15 years.

Water Heater Wrap

Description

This measure relates to a Tank Wrap or insulation "blanket" that is wrapped around the outside of a hot water tank to reduce stand-by losses. This measure applies only for homes that have an electric water heater that is not already well insulated. Generally this can be determined based upon the appearance of the tank.

Algorithms

$$kWh = kWh_{base} \times \frac{(EF_{new} - EF_{base})}{EF_{new}}$$

$$kW = \frac{\Delta kWh}{8,760}$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
kWh _{base}	Average kWh consumption of electric domestic hot water tank.
EF _{new}	Assumed efficiency of electric tank with tank wrap installed.
EF _{base}	Assumed efficiency of electric tank without tank wrap installed.
8,760	Number of hours in a year.

Assumptions

The expected measure life is 5 years.

Pipe Wrap

Description

This measure describes adding insulation to un-insulated domestic hot water pipes. The measure assumes the pipe wrap is installed to the first length of both the hot and cold pipe up to the first elbow.

Algorithms

$$kWh = \frac{\left(\left(\frac{1}{R_{e, old}} - \frac{1}{R_{new}} \right) \times L \times C \times \Delta T \times 8,760 \right)}{\eta_{DHW} \times 3,413}$$

$$kW = \frac{\Delta kWh}{8,760}$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
ISR	In Service Rate or fraction of units that get installed

R_{exist}	Pipe heat loss coefficient of non-insulated pipe (existing)
R_{new}	Pipe heat loss coefficient of insulated pipe (new)
L	Length of pipe from water heating source covered by pipe wrap (ft.)
C	Circumference of pipe (ft.)
ΔT	Average temperature difference between supplied water and outside air temperature (°F)
η_{DHW}	Recovery efficiency of electric hot water heater
3,413	Conversion from Btu to kWh
8,760	Number of hours in a year

Assumptions

The expected measure life is 15 years.

Low Flow Showerhead

Description

This measure relates to the installation of a low flow showerhead in a home. This is a retrofit direct install measure or a new installation. Both electric and fossil fuel savings are provided, although only savings corresponding to the hot water heating fuel should be claimed.

Algorithms

$$kWh = ISR \times (GPM_{base} - GPM_{low}) \times \frac{kWh}{GPM_{reduced}}$$

$$kW = \frac{\Delta kWh}{Hours} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
ISR	In Service Rate or fraction of units that get installed.
GPM_{base}	Gallons per minute of baseline faucet.
GPM_{low}	Gallons per minute of low flow faucet.
$kWh/GPM_{reduced}$	Assumed kWh savings per GPM reduction.
$\Gamma_{install}$	Rate of install.
$\Gamma_{persist}$	Rate of persistence.
Hours	Average number of hours per year spent using faucet.
CF	Coincidence Factor.

Assumptions

The expected measure life is 15 years.

Programmable Thermostat

Description

Programmable Thermostats can save energy through the advanced scheduling of time-of-day and/or day-of-week setbacks to control heating and cooling set-points. Typical usage reduces the heating set-point during times of the day when occupants are usually not at home (work hours); keeping the home at a cooler temperature in the winter reduces heat losses relative to a higher temperature.

Algorithms

$kWh = 1\% \text{ Energy Savings for each degree of set-back over an 8-hour period.}$

$kW = \text{Winter/Summer Hours} * kWh * CF$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
CF	Coincidence Factor.

Assumptions

The expected measure life is 15 years.

Validation Rules

Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis (or the end of the measure's expected life).
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Program Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Free Ridership	27%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%


Appendix - Exhibits

Exhibit 1 - Fact Sheet

AEP KENTUCKY POWER
A unit of American Electric Power

Modified Energy Fitness Program
Fact Sheet

Program Overview
With the Kentucky Power Modified Energy Fitness Program, you can reduce your all-electric home's energy use while improving your comfort. The program helps you identify key areas within your home where you are losing valuable energy and can implement potential improvements.



Kentucky Power is partnering with Honeywell International, a nationally recognized energy management firm, to provide this service. A highly-trained Honeywell International home energy auditor is available to provide you energy-saving measures and recommendations on ways to make your home more energy efficient.

By participating in this program, you can receive:

- Air infiltration diagnostic test to find air leaks
- A complete energy audit with customized report
- Energy savings booklet
- Energy conservation measures installed (per program guidelines)
 - Domestic hot water pipe insulation
 - Water heater insulation wrap
 - Low flow shower head
 - Weatherstripping / caulking / doorsweep
 - Duct sealing
 - High efficiency compact fluorescent light bulbs (CFLs)

Customer Eligibility
The Modified Energy Fitness Program is a weatherization program designed specifically for Kentucky Power's all-electric residential customers. To qualify for the program you must own a single family home that used an average of 1,000 kWh per month over the last 12 months.

Want to know where your home is wasting energy?
Schedule your audit appointment through Kentucky Power's Modified Energy Fitness Program, and you'll get free energy-saving items and recommendations on ways to make your home more energy efficient.

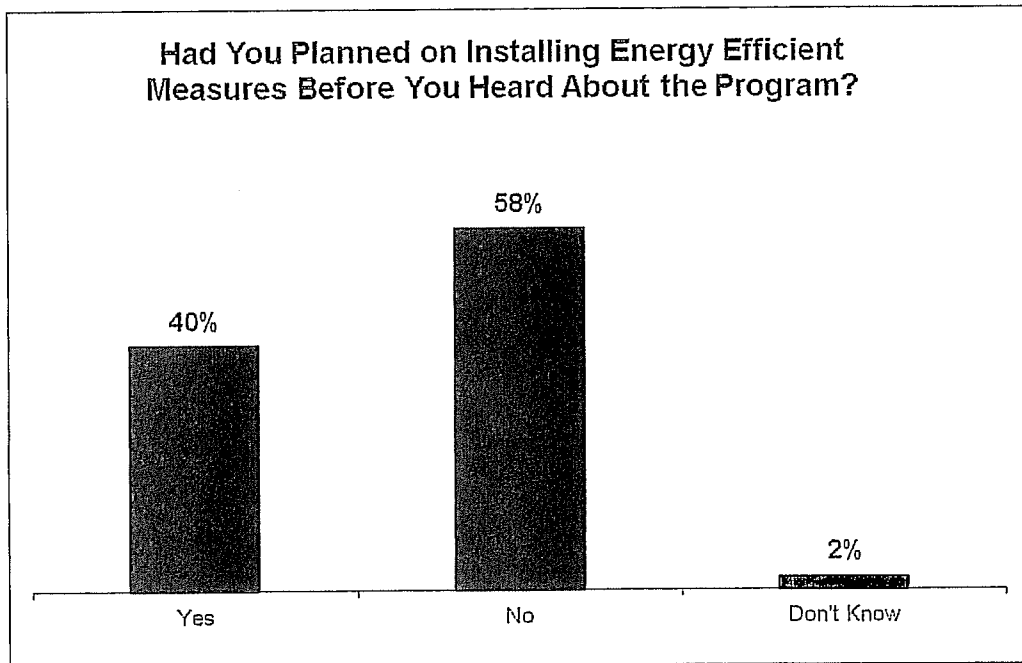
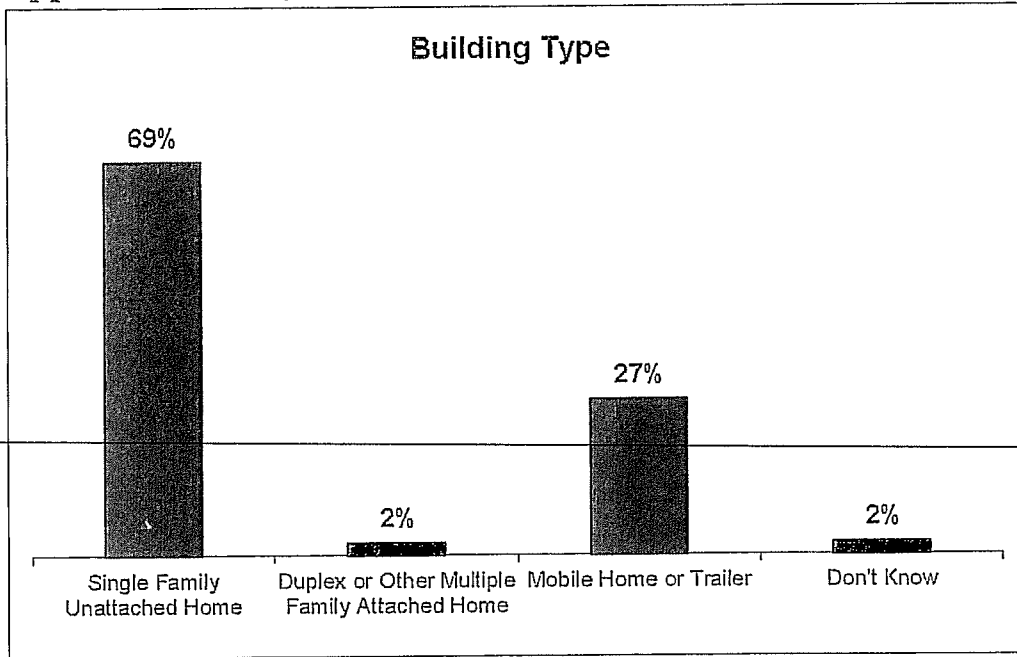
How to Participate
Call 1-866-225-0686 to schedule your appointment. Remember, there is nothing to buy, and no follow-up sales call will result from your participation.

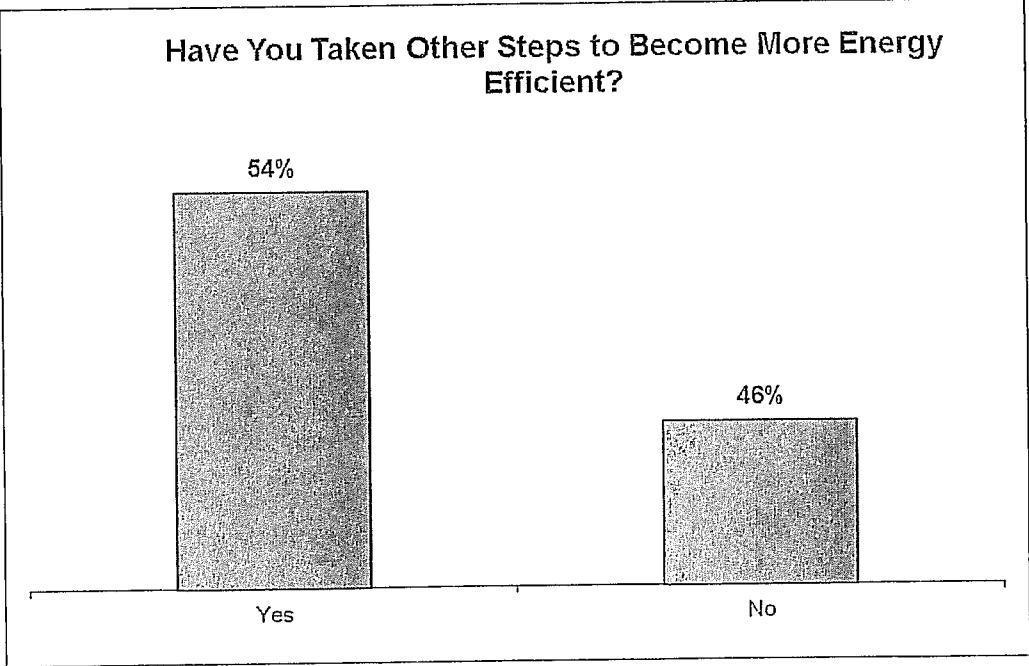
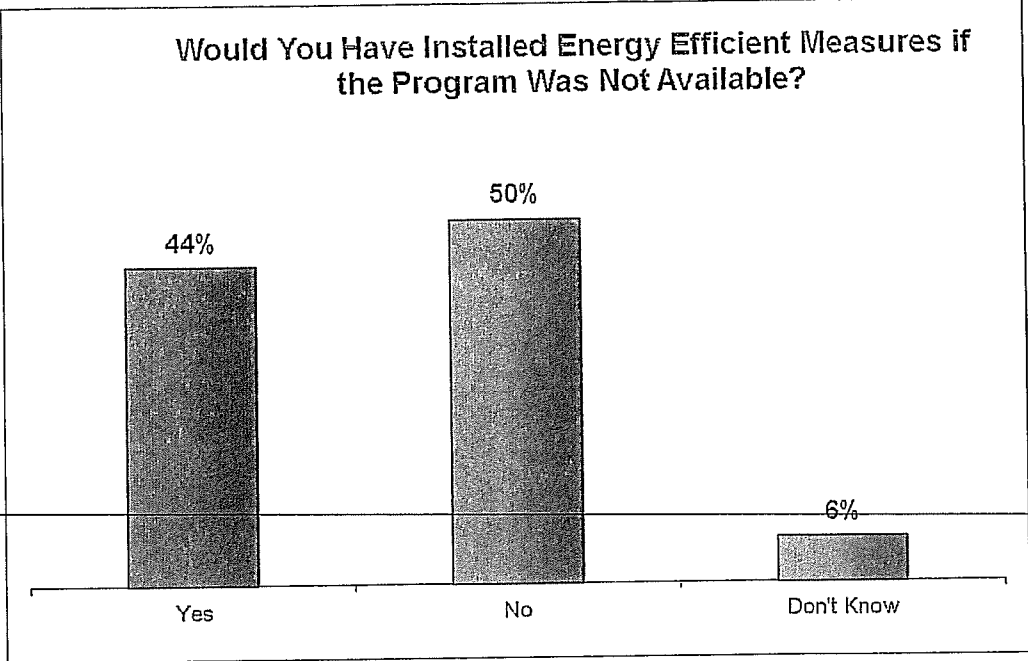
Other Opportunities
Kentucky Power offers a suite of SMART Programs, which are energy efficiency programs for homes, businesses and schools. For more information on this program or other SMART Programs, call 1-800-572-1113 or visit KentuckyPower.com/save.

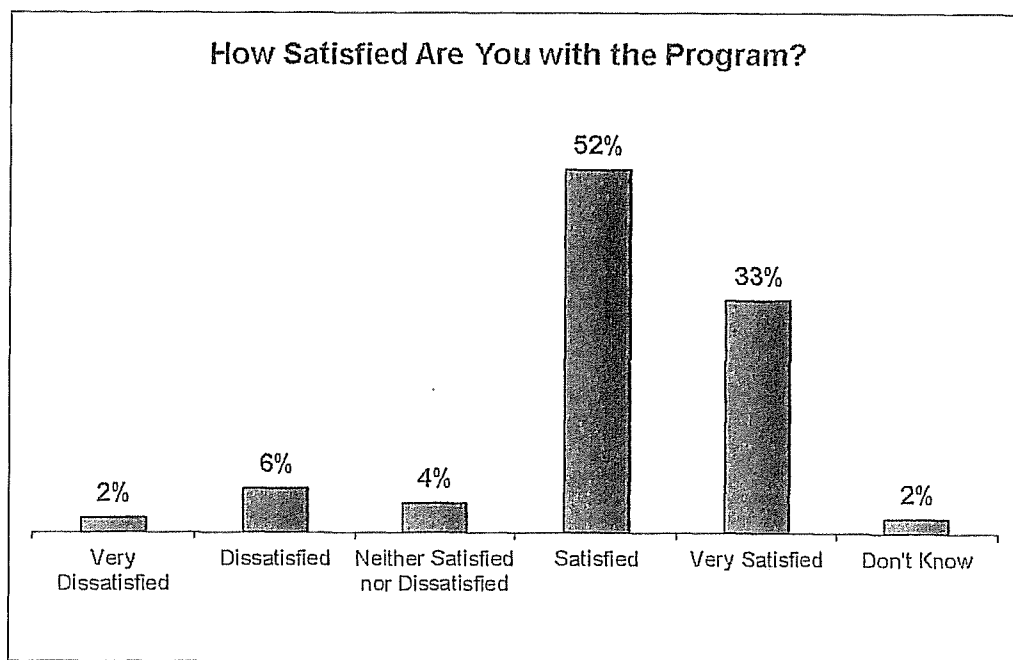
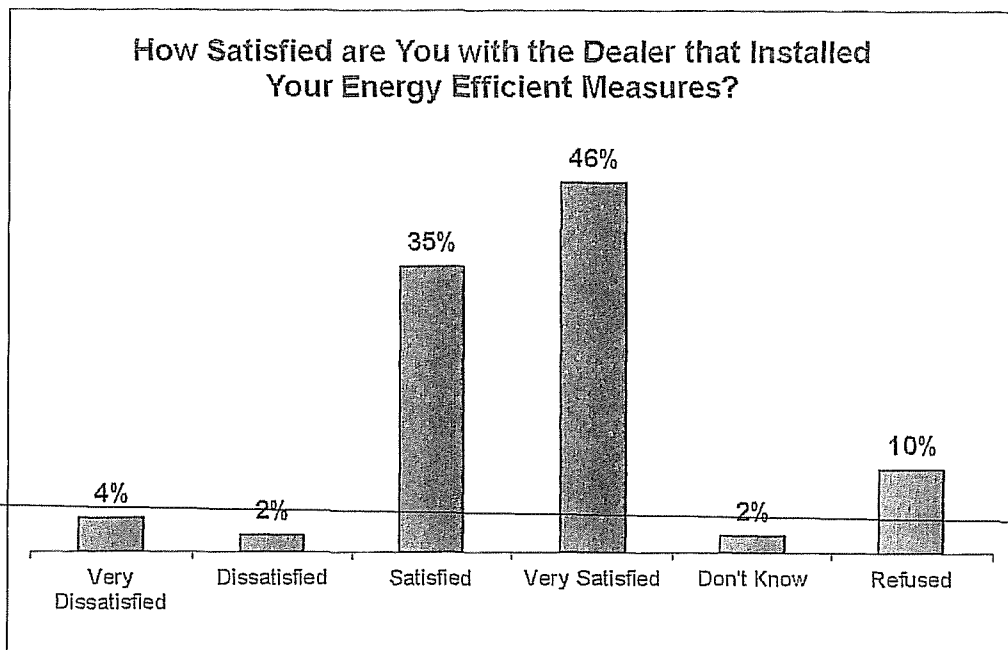
SMART Programs - Saving Money And Resources TogetherSM

gridSMART
From Kentucky Power

Appendix - Survey







Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
aragraves@aep.com

Joseph Chambers
Contractor
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

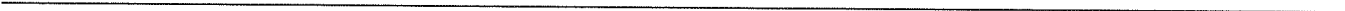
Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kjvass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrnicek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com





Evaluation Report

Kentucky Power Company High Efficiency Heat Pump

Evaluation Report for 2009-2010

July 2011

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	6
Summary	6
Promotional Effectiveness.....	6
Delivery Mechanism	6
Data Tracking.....	7
Free Riders and Spillover	7
Market Potential	7
Customer Satisfaction	8
Impact Evaluation	9
Resistance Results.....	9
Replacement Results.....	10
Total Results	11
Cost Effectiveness Evaluation.....	13
Prospective Analysis.....	16
Recommendations.....	17
References	18
Appendix – Impact Methods and Assumptions	19
Impact Methodology	19
Billing Analysis	19
Analysis Results.....	23
Analysis Graphs.....	24
Control Group Analysis.....	28
Appendix - Engineering Estimates	30
Estimation Methodology.....	30
Technology Description	30
Algorithms	31
Terms	31
Validation Rules	31
Assumptions.....	31
Appendix – Exhibits.....	32
Exhibit 1 – Bill Insert.....	32
Exhibit 2 – Fact Sheet.....	34
Appendix – Resistance Survey	35
Appendix – Replacement Survey.....	37
Appendix – Heat Pump Dealers.....	39
Appendix – EE/DR Analytics Team Members	42
Load Research.....	42
EE and Consumer Programs.....	42
Marketing.....	422

Executive Summary

The Kentucky Power Company (KPC) High Efficiency Heat Pump (HEHP) program is designed to reduce residential electric energy consumption by upgrading less efficient electric heating and cooling systems with high-efficiency heat pumps. Advanced technology has increased the efficiency of heat pump systems, resulting in higher energy savings and a greater demand reduction. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. For 2009 and 2010, the HEHP program replaced 1,069 HVAC systems with heat pumps, providing 1,693 MWh of net annualized energy savings and 607 kW of winter peak demand reductions. The process evaluation concluded that the promotion and delivery processes continue to be effective.

Based on the results of the evaluation, the HEHP program was determined to be cost-effective for three of the cost-benefit tests used in the California Standard Practice Manual and KPC should continue to utilize the program through the remainder of the current program life (2011). The prospective analysis of the program for 2012-2014 predicts the program will be cost-effective and should be continued.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio	Winter Peak Ratio
Program Administrator Cost (PACT)	1.31	2.27
Total Resource Cost (TRC)	1.01	1.74
Ratepayer Impact Measure (RIM)	0.37	0.65
Participant Cost (PCT)	2.21	2.21

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	2.72
Total Resource Cost (TRC)	2.03
Ratepayer Impact Measure (RIM)	0.74
Participant Cost (PCT)	2.24

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Kentucky High Efficiency Heat Pump program was developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on February 24, 2009 (Case No. 2008-00349) to help meet Kentucky Power's goals.

The High Efficiency Heat Pump program is designed to reduce residential electric energy consumption by upgrading less efficient electric heating and cooling systems with high-efficiency heat pumps. Advanced technology has increased the efficiency of heat pump systems, resulting in higher energy savings and a greater demand reduction. This program is appropriate, as it helps lower electric bills for all residential customers and allows Kentucky Power Company to utilize its existing generating capacity more efficiently, thereby deferring the need for new generation as well as conserving our country's valuable natural resources. A significant gain in efficiency can be obtained by upgrading these HVAC systems with high efficiency heat pumps, which exceed USDOE minimum efficiency standards (13 SEER and 7.7 HSPF).

Kentucky Power Company promoted the program through HVAC contractors and paid incentives to both the contractor and the customers who purchased a high-efficiency heat pump to replace their existing electric resistance heat system or electric heat pump unit.

The major goals of the High Efficiency Heat Pump program are to:

- 1) Reduce energy consumption of electrically heated homes
- 2) Assist and encourage residential customers to improve heating, ventilation, and air conditioning (HVAC) efficiency by installing high efficiency heat pumps
- 3) Increase customer satisfaction and services
- 4) Reduce Kentucky Power's long-range peak demand.

Process and Market Evaluation

Summary

The Program first became active in 2009 and immediately met participant goals. The 2011 survey of participants indicated that slightly less than one-half of the participants replacing a heat pump and about one third of the participants replacing a forced-air furnace would likely have purchased an equivalent high efficiency heat pump without the program. Thus it can be inferred that the program influenced the decision making of most customers making heating system replacement decisions in 2009 and 2010. The promotion method employed was effective, but improvements in promotion could be considered. The delivery mechanism continues to be effective, as goals were reached and customer satisfaction levels were high.

Promotional Effectiveness

KPC promoted the program through an established network of participating HVAC contractors and with a bill insert (Exhibit 1 in Appendix). In 2010, KPC staff reviewed a database of all HVAC contractors in and near the KPC service territory, pursued recruitment of additional contractors, and successfully expanded the base of participating contractors. KPC staff estimated that 80% of HVAC contractors in KPC service territory are now participating in the program. Participants normally became aware of the program only after they contacted a participating HVAC contractor and inquired about heating system replacement. Some participants may have also heard about the program from neighbors and friends. A customer incentive of \$400, as approved by the Kentucky Demand Side Management Collaborative, was provided to offset a significant portion of the incremental cost of the high-efficiency upgrade. Dealers received a \$50 incentive for each installation to offset the cost of their time and effort. This promotional method is likely effective in reaching customers who need to replace their heating system, but direct program promotion to all customers could accelerate some heating system replacement decisions and provide a better understanding of the program for customers considering HVAC replacements.

Delivery Mechanism

To qualify for the program, each HVAC contractor was required to be licensed and certified within the state of Kentucky. When contacted by a KPC customer, the HVAC contractor explained the program to the customer, described the incentive offered for installing a new high efficiency heat pump, and provided the customer with the KPC provided marketing material. Once selected for the project, the contractor handled all facets of the installation and provided the Company with customer installation

reports from which incentive payments were made to the customers and the contractor. KPC staff entered the information into an Excel spreadsheet for participant tracking, worked with the contractors to resolve any missing or questionable information, and processed the rebates. No on-site inspections were performed to verify the provided heat pump information and quality of contractor installation.

Data Tracking

A large number of problems were found when examining the data tracking efforts of KPC staff. Many pieces of data were missing that are required to produce engineering estimates for Air Source Heat Pumps. Specifically, each customer must have the baseline and replacement Heating Seasonal Performance Factor (HSPF), Seasonal Energy Efficiency Rating (SEER), Energy Efficiency Rating (EER), size in tonnage or British thermal unit hours (BtuH) for every customer. The implementation data for this program was missing the EER of the new heat pumps. Without EER, accurate demand estimates cannot be made. However, as a whole, data collection and tracking was very well done.

Free Riders and Spillover

A free rider is a participant who installed a high-efficiency heat pump system, but would have installed the same system had they not participated in the Program. Spillover refers to additional energy efficiency measures adopted by participants as a result of the program. Free ridership was determined by dividing the total survey responses by the positive responses to the questions "Had you planned on installing a heat pump before you heard about the program?" and "Would you have installed a heat pump if the program was not available?" From the survey responses, 46% of participants replacing an existing heat pump and 33% of participants replacing a central forced air furnace with a high efficiency heat pump indicated they would have purchased the same high-efficiency heat pump without the program and thus were classified as likely free riders in this program. No information on possible spillover effects was captured in the survey.

Market Potential

The 2010 Residential Customer Survey showed that approximately 45,000 KPC households reside in single family homes which they own and for which electricity is used for heating. Over 25,000 of those currently heat with a heat pump and over 6,000 with a central forced air furnace. About 2,400 of the forced air HVAC systems in those homes are more than fifteen years old, and over 2,500 of the heat pumps are of that age. The 2011 participant survey indicated that more than 50% of the participants would have purchased a high-efficiency heat pump without the program, indicating that the choice of a high-efficiency heat pump is becoming somewhat common. Even though the choice is becoming more common, there is clearly still a continuing need for encouraging high-efficient heat pump installations as replacements for both central furnace and heat pump systems. Setting a goal of influencing at least 200 purchases in each of the next two years is reasonable.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was high.

In the Resistance Survey 92% of the survey respondents indicated they were very satisfied (42%) or satisfied (50%) with the program. In the Replacement Survey 89% of the survey respondents indicated they were very satisfied (51%) or satisfied (38%) with the program. Two respondents were very dissatisfied, one was dissatisfied, and six expressed a neutral opinion. From the comments received the source of the dissatisfied response was based upon the recent KPC rate increase and not the HEHP program itself. One of the very dissatisfied respondents thought the new heat pump used more electricity than his previous system and that the air was not warm. The other gave no reason for his/her dissatisfaction.

Impact Evaluation

The HEHP evaluation consisted of a billing analysis coupled with engineering estimates of the implementation data collected by KPC. The billing analysis was used to determine net savings by participant. The engineering estimates were used to develop gross measure savings by participant. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. To effectively capture the change in usage patterns, an evaluation needs both pre- and post-installation billing data. The per-participant billing analysis savings are compared to the per-participant engineering estimates to determine an estimated Net-to-Gross ratio. In theory, the billing analysis results should capture the free ridership and spillover behaviors of participant group. Those results are then compared to the survey results to see if the free ridership and spillover questions asked corroborate the analysis. Further details of the billing analysis and engineering estimates can be found in the appendixes.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. Once a valid set of customers was determined, the next step was to perform a billing analysis and create engineering estimates using the algorithm for Air Source Heat Pumps (Appendix – Engineering Estimates) to determine an average per-participant energy, summer peak, and winter peak savings value. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings are in the below table.

2009 and 2010 Average Net Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
Resistance Per Participant Savings	1,342	-0.140	0.520
Replacement Per Participant Savings	1,698	-0.020	0.590

Resistance Results

For 2009, KPC had goals of replacing 75 Resistance Heat customers with higher efficiency heat pumps and saving KPC customers 313 MWh and 218 kW in winter peak demand. The program was able to replace 91 heat pumps, and produce net annualized total program savings of 122 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized winter peak demand reductions were 47 kW. KPC met 121% of their participant target, 39% of their energy target, and 22% of their winter demand target. Summer demand savings were not expected in Resistance Heat customers, as the heat pump does not replace the air conditioner or any other cooling appliances. However, it would be a mistake to assume that the new heat pump does not use any load.

For customers without a separate cooling appliance, the heat pump provides a way for them to cool their residence. Because of this, load growth occurs. The 2009 Resistance Heat customer installation results showed a net summer demand increase of 13 kW.

For 2010, KPC had goals of replacing 100 Resistance Heat customers with higher efficiency heat pumps and saving KPC customers 418 MWh and 290 kW in winter peak demand. The program was able to replace 252 heat pumps, and produce net annualized total program savings of 338 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized winter peak demand reductions were 131 kW. KPC met 252% of their participant target, 81% of their energy target, and 45% of their winter demand target. Again, summer demand savings were actually summer demand growth with a net summer demand increase of 35 kW.

Impact Evaluation Results by Year for Resistance Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	75	91	91	121%
Energy (MWh)	313	380	122	39%
Summer Demand (kW)	-	-	(13)	
Winter Demand (kW)	218	264	47	22%
2010				
Participants	100	252	252	252%
Energy (MWh)	418	1,052	338	81%
Summer Demand (kW)	-	-	(35)	
Winter Demand (kW)	290	731	131	45%
Total				
Participants	175	343	343	196%
Energy (MWh)	731	1,432	460	63%
Summer Demand (kW)	-	-	(48)	
Winter Demand (kW)	508	995	178	35%

Replacement Results

For 2009, KPC had goals of replacing 200 older heat pumps with higher efficiency heat pumps and saving KPC customers 172 MWh, 47 kW in summer peak demand, and 89 kW in winter peak demand. The program was able to replace 217 heat pumps, and produce net annualized total program savings of 368 MWh and 128 kW in winter peak demand savings. KPC met 109% of their participation target, 215% of their energy target, and 144% of their winter peak demand target. The analysis found that load growth occurred during the summer peak season. The negative summer demand savings is most likely attributable to snap back. In instances where customers are living below their level of comfort, a potential for energy savings will not actually result in energy savings but will instead produce an increase

in energy usage so that the customer can live closer to their desired comfort level. As an example, if a customer would prefer a residence cooled to 74 degrees in the summer, but can only afford 76 degrees, when presented with monetary savings from a reduced bill will move their thermostat to 74 degrees, rather than retain their lower bills.

KPC had goals of replacing 250 older heat pumps with higher efficiency heat pumps in 2010, which would save KPC customers 215 MWh, 59 kW in summer peak demand, and 111 kW in winter peak demand. The program was able to replace 509 heat pumps, and produce net annualized total program savings of 864 MWh and 300 kW in winter peak demand savings. KPC met 204% of their participation target, 403% of their energy target, and 271% of their winter peak demand target. The analysis found that load growth occurred during the summer peak season in the amount of 10 kW.

Impact Evaluation Results by Year for Replacement Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	200	217	217	109%
Energy (MWh)	172	186	368	215%
Summer Demand (kW)	47	51	(4)	-9%
Winter Demand (kW)	89	96	128	144%
2010				
Participants	250	509	509	204%
Energy (MWh)	215	437	864	403%
Summer Demand (kW)	59	120	(10)	-17%
Winter Demand (kW)	111	226	300	271%
Total				
Participants	450	726	726	161%
Energy (MWh)	386	623	1,233	319%
Summer Demand (kW)	106	171	(15)	-14%
Winter Demand (kW)	200	322	428	214%

Total Results

For the first two years of the HEHP program, KPC was able to replace 343 Resistance heat systems, producing net annualized program savings of 460 MWh of energy savings and 178 kW in winter peak reductions. There was also a growth of 48 kW on the summer peak. KPC also replaced 726 heat pumps, producing net annualized program savings of 1,233 MWh and 428 kW in winter peak reductions. Summer peak demand growth was 15 kW. As a whole, KPC was able to install 1,069 heat pumps and produce savings of 1,693 MWh and 607 kW in winter peak demand reductions. Total summer peak demand growth was 63 kW. KPC met 171% of their participant target, 152% of their energy target, and 86% of their winter demand target. Participation, annual energy savings, and winter peak demand numbers were at or above the expected goals; however the summer demand savings were non-

existent. It is possible the control groups used for the impact evaluation were biased due to lurking variables, specifically the HVAC system of each control customer. The AEP CIS system does not contain any information on the physical characteristics of a premise. Due to this, only residential all-electric customers were used for control choices, as it was the best data available.

Below are the impact evaluation results for the customers that were replacing a heat pump.

The total savings for all participants in the High Efficiency Heat Pump program are listed below. As a whole, participation, energy savings, and winter demand savings were near or above target.

Impact Evaluation Results by Year for All Customers

Category	Goal	Ex-Ante	Ex-Post	Percent of Goal
2009				
Participants	275	308	308	112%
Energy (MWh)	485	566	491	101%
Summer Demand (kW)	47	51	(17)	-36%
Winter Demand (kW)	306	360	175	57%
2010				
Participants	350	761	761	217%
Energy (MWh)	632	1,489	1,202	190%
Summer Demand (kW)	59	120	(45)	-77%
Winter Demand (kW)	401	957	431	108%
Total				
Participants	625	1,069	1,069	171%
Energy (MWh)	1,117	2,055	1,693	152%
Summer Demand (kW)	106	171	(63)	-59%
Winter Demand (kW)	707	1,317	607	86%

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects. Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included for recovery purposes, unless new labor was utilized incrementally and specifically for DSM program implementation.

In 2009, the total program costs as filed with the Kentucky DSM Collaborative were \$138,450 of which \$123,150 were listed as incentives. However, these costs do not include the unrecoverable administrative costs from KPC staff and AEPSC staff. An estimated \$32,909 was included under administration to account for unrecoverable costs, bringing the total to \$171,359 in actual costs related to the program. No expenditure goals for 2009 were found in the Collaborative Report. The 2010 total filed program costs were \$378,425, of which \$276,950 were listed as incentives. To account for unrecoverable admin costs and the costs from the 2011 evaluation, another \$38,225 was added to 2010 and \$15,000 was added to 2011 to account for admin and evaluation costs respectively. Expenditure goals in the Collaborative Report for 2010 activities were listed as \$157,500. The increase in expenditures was due to much larger participation than expected.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analysis attempted to account for all costs related to program implementation and evaluation. Therefore an estimate of the value of KPC and AEP Service Corporation (AEPSC) staff time utilized to implement and evaluate the

program was added to the reported costs. The below table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	Total
2009	\$32,909	\$15,300	\$123,150	\$-	\$171,359
2010	\$38,225	\$63,250	\$276,950	\$-	\$378,425
2011	\$-	\$-	\$-	\$15,000	\$15,000

Goals were reported as total amounts respective to the winter peak only, however, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP generation pool that experiences summer peaking conditions, and winter to account for KPC's maximum system load that occurs in the winter. Benefit costs tests were performed by Resistance Heat, Replacement, and Total participation. Results were lower than expected, though unremarkable. It is expected that prospective benefit cost ratios for a new program will be overestimated, sometimes wildly, due to the sunny disposition and uncertain nature of market potential studies.

Goals for Resistance Heat participants were a Program Administrator Cost (PACT) ratio of 11.63, a Total Resource Cost (TRC) ratio of 14.53, a Ratepayer Impact Measure (RIM) ratio of 0.91, and a Participant Cost (PCT) ratio of 15.44. Results for benefit cost ratios for Resistance Heat participants at summer peak was 0.91 for the PACT, 0.65 for the TRC, 0.29 for the RIM, and 1.79 for the PCT. Results for benefit cost ratios for Resistance Heat participants at winter peak was 1.91 for the PACT, 1.37 for the TRC, 0.62 for the RIM, and 1.79 for the PCT. All results were much lower than expected, though unsurprising.

2009 and 2010 Summer Peak Cost Effectiveness Analysis – Resistance Only

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	0.91	\$ (15,699)	\$ 158,026	\$ 173,725
Total Resource Cost (TRC)	0.65	\$ (83,937)	\$ 158,026	\$ 241,963
Ratepayer Impact Measure (RIM)	0.29	\$ (378,228)	\$ 158,026	\$ 536,254
Participant Cost (PCT)	1.79	\$ 201,299	\$ 456,226	\$ 254,927

2009 and 2010 Winter Peak Cost Effectiveness Analysis – Resistance Only

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.91	\$ 158,098	\$ 331,823	\$ 173,725
Total Resource Cost (TRC)	1.37	\$ 89,860	\$ 331,823	\$ 241,963
Ratepayer Impact Measure (RIM)	0.62	\$ (204,431)	\$ 331,823	\$ 536,254
Participant Cost (PCT)	1.79	\$ 201,299	\$ 456,226	\$ 254,927

Goals for Replacement participants were a Program Administrator Cost (PACT) ratio of 2.00, a Total Resource Cost (TRC) ratio of 1.91, a Ratepayer Impact Measure (RIM) ratio of 0.53, and a Participant Cost (PCT) ratio of 2.06. Results for benefit cost ratios for Replacement participants at summer peak was 1.50 for the PACT, 1.19 for the TRC, 0.41 for the RIM, and 2.40 for the PCT. Results for benefit cost ratios for Resistance Heat participants at winter peak was 2.44 for the PACT, 1.94 for the TRC, 0.66 for the RIM, and 2.40 for the PCT. All results were higher than expected due to the higher than expected annualized energy savings.

2009 and 2010 Summer Peak Cost Effectiveness Analysis – Replacement Only

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.50	\$ 181,555	\$ 544,298	\$ 362,743
Total Resource Cost (TRC)	1.19	\$ 88,716	\$ 544,298	\$ 455,582
Ratepayer Impact Measure (RIM)	0.41	\$ (798,592)	\$ 544,298	\$ 1,342,890
Participant Cost (PCT)	2.40	\$ 760,973	\$ 1,303,171	\$ 542,198

2009 and 2010 Winter Peak Cost Effectiveness Analysis – Replacement Only

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	2.44	\$ 521,466	\$ 884,208	\$ 362,743
Total Resource Cost (TRC)	1.94	\$ 428,627	\$ 884,208	\$ 455,582
Ratepayer Impact Measure (RIM)	0.66	\$ (458,681)	\$ 884,208	\$ 1,342,890
Participant Cost (PCT)	2.40	\$ 760,973	\$ 1,303,171	\$ 542,198

Total program benefit cost results were cost-effective from Participant, Program Administrator, and Total Resource perspectives. Program design did not produce total program ratios, so nothing existed to which to compare. If the uncertainty from the lack of population comparison data is accounted for, all three ratios above (PCT, PACT, and TRC) are considered greater than one, and cost beneficial, regardless of peak season.

2009 and 2010 Summer Peak Cost Effectiveness Analysis

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.31	\$ 165,856	\$ 702,324	\$ 536,468
Total Resource Cost (TRC)	1.01	\$ 4,779	\$ 702,324	\$ 697,545
Ratepayer Impact Measure (RIM)	0.37	\$ (1,176,820)	\$ 702,324	\$ 1,879,144
Participant Cost (PCT)	2.21	\$ 962,272	\$ 1,759,397	\$ 797,126

2009 and 2010 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	2.27	\$ 679,564	\$ 1,216,032	\$ 536,468
Total Resource Cost (TRC)	1.74	\$ 518,487	\$ 1,216,032	\$ 697,545
Ratepayer Impact Measure (RIM)	0.65	\$ (663,113)	\$ 1,216,032	\$ 1,879,144
Participant Cost (PCT)	2.21	\$ 962,272	\$ 1,759,397	\$ 797,126

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, there will be any changes to the cost effectiveness of the program in future years. Any number of a multitude of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the HEHP program, results from the current evaluation were used as the starting point for the cost-benefit analysis. A higher free ridership value was included in the prospective analysis, from 31% to 40%. However, the lower annualized energy savings due to increased free ridership is offset by an increase in the cost of avoided energy in future years.

Due to KPC being a winter peaking utility, only the winter peak cost benefit analysis was run. The results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective and should be continued.

2012-2014 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	2.72	\$ 1,886,577	\$ 2,984,494	\$ 1,097,917
Total Resource Cost (TRC)	2.03	\$ 1,515,754	\$ 2,984,494	\$ 1,468,740
Ratepayer Impact Measure (RIM)	0.74	\$ (1,050,510)	\$ 2,984,494	\$ 4,035,004
Participant Cost (PCT)	2.24	\$ 2,065,979	\$ 3,732,212	\$ 1,666,233

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the HEHP program.

- 1) Results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective. It is our recommendation that this program be continued.
- 2) Inclusion of EER for every heat pump installed, and if possible, the EER of the replacement heat pump should be collected.
- 3) Future costs should be captured in a more organized and delineated manner. Each program should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.

- 4) ~~On-going program management should be handled by KPC staff, including tracking of customer participation and estimating ex-ante savings.~~
- 5) KPC staff labor time spent on the Program should be captured so that the true total cost of delivering the program can be known.
- 6) KPC should request AEP add fields to the AEP CIS to capture HVAC information on their customers. This would provide a more accurate way of comparing the participant group to the population for billing analyses.
- 7) Program participants should be surveyed shortly after the rebate is processed.
- 8) KPC staff should perform on-site installation audits for a small sample of participants. This may necessitate adding another employee.
- 9) KPC should gather information from the dealers about customers that were interested in the program but declined to participate. Using that information, KPC should then sample the customer list and perform a non-participant survey to find any reasons for non-participation.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.
- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual. Ohio TRM – Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.

- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template. Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline. MS Excel Workbook. 20 May 2010.
- VII. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- VIII. Mohr, Lawrence B. Impact Analysis For Program Evaluation. 2nd Ed. 1995
- IX. The SAS Institute. The EXPAND Procedure. http://support.sas.com/documentation/cdl/en/etsug/60372/HTML/default/viewer.htm#expand_toc.htm
- X. DeBoor, Carl (1981), A Practical Guide to Splines, New York: Springer-Verlag.
- XI. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- XII. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XIII. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix – Impact Methods and Assumptions

Impact Methodology

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long term savings from the specific installations.

Billing Analysis

Impact evaluation consists of two stages, interim impact evaluation and full impact evaluation. Engineering estimates are used to develop measure savings without post-consumption data. Implementation data is utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. The full impact evaluation consists of a billing analysis. This analysis utilizes relevant weather data and billing data with the statistical regression models to determine the savings impact of the program. A comparison of customers' bills before and after the implementation of the program is used to determine changes in usage and demand that can be attributed to the program. In order to isolate the effects of the program from unassociated changes in consumption, a Participant Group and a distinct but similar Control Group is compared. The Control Group will not contain program participants, but its customers will be similar in consumption to the program participants. After defining these research groups, billing data is weather-normalized to eliminate any effects due to weather differences before and after program implementation. Finally, regression models will be used to analyze the normalized data and provide savings values.

The first step of the billing analysis is to create a valid participant list from which to analyze. Each customer is checked to ensure that data existed for at least one year pre and post measure installation. Participants were also required to have data for all of 2008 to develop a set of comparison metrics for drawing the control group. Any customers that did not have the requisite billing data, or were inactive at the time of analysis, were discarded from analysis.

For 2009, the implementation data provided showed that 91 resistance heat and 217 replacement customers participated. One customer was not active in the AEP Customer Information System (CIS) at the time of installation, and 32 were not found in the CIS at all. In all, 60 Resistance and 234 Replacement customers were available for analysis. In 2010, after validation, 38 customers were not in the AEP CIS; leaving 226 Resistance and 430 Replacement customers available for analysis. In total there were 286 Resistance and 664 Replacement customers in the implementation data that were valid for analysis.

After the participant list was created, a set of energy statistics was developed to compare to the control group. For each customer, an annual kWh, summer peak month kWh, and winter peak month kWh (formulas below) were calculated using 2008 billing data. KPC summer and winter peaks were pulled from the AEP Load Research system peak data and applied to each customer bill that contained that date, and was used to create a summer and winter monthly energy value.

Formula for determining comparison statistics between participant and control group

$$kWh_{annual} = 365 \times \frac{\sum kWh_per_Bill}{\sum Days_per_Bill} \quad kW_s = 31 \times \frac{kWh_per_Bill_s}{Days_per_Bill_s} \quad kW_w = 31 \times \frac{kWh_per_Bill_w}{Days_per_Bill_w}$$

After participant group selection is complete, the KPC population is validated to provide a list of potential control group customers. The population is usually constrained by one or more of program class (residential, C&I, etc...), building characteristics (single-family, mobile home, etc...), fuel type (all electric, natural gas, etc...), and income level (HEAP, non-HEAP, all). Customers are removed from consideration if they are not continuously active from January 1, 2008 until current. After the control population has been validated, comparison statistics are calculated using the above formulas.

After the control population group has been established, and both the control population's and participant group's comparison statistics have been calculated, the control population's customers are compared to the participants to provide a baseline comparison. Each participant customer is matched to all control population customers, and the top 50 most accurate matches are kept for further analysis. Matching is determined by calculating an Absolute Relative Deviation (ARD) for the Annual kWh, summer kWh, and winter kWh comparison statistics. The customers with the lowest combined ARD are kept for further validation. For each of the 50 control customers, they are assigned the same installation date as the participant customer. Each of the 50 customers is then validated using

the same pre/post rules as the participant customers. Each control customer must have at least one year of data pre and post the pseudo-installation of the measure.

Formula for comparing control population customer to participant

$$ARD = ARD_{kWha} + ARD_{kWhs} + ARD_{kWhw}$$

$$ARD_{kWha} = \frac{|kWha_{ctrl} - kWha_{part}|}{kWha_{ctrl}} \quad ARD_{kWhs} = \frac{|kWhs_{ctrl} - kWhs_{part}|}{kWhs_{ctrl}} \quad ARD_{kWhw} = \frac{|kWhw_{ctrl} - kWhw_{part}|}{kWhw_{ctrl}}$$

After the 40 customers have been compared to the participant, the top 20 are kept for further evaluation. Twenty control groups are used for comparison because of the variance of the population. The population variance is high because the AEP CIS does not contain enough demographic data on the customer to create a very accurate regression model. There are too many lurking variables in a billing analysis if enough data is not included, which can bias the results. Once the 20 control groups have been selected, each group is run, pairwise, with the participant group through the entire billing analysis process. Final results for each run of the analysis are compared to ensure that none of the control groups are extreme in either direction (load savings or load growth). Using an alpha of .05 for Type I error testing, and a beta of .10 for Type II, or power testing, checks are completed to ensure that the control group methodology is valid. Once the methodology is verified, the first control group, being the most accurate, is used for the regression portion and official savings calculations. If there are concerns about uncertainty, all 20 control groups will be run and the numbers will be aggregated as a replicated analysis.

The regression analysis is conducted by constructing two models, a baseline and treatment weather normalized panel model. A panel analysis is a two-dimensional time-series and cross-sectional model used to evaluate changes in the effects of a treatment on a treatment group compared to a control group over time. Weather Normal, or Typical Meteorological Year, data is created by the U.S. National Renewable Energy Laboratory (NREL) to represent weather data for a typical year. The TMY2 dataset was used for all KPC billing analysis, and is derived from the 1961-1990 National Solar Radiation Data Base (NSRDB).

The baseline model is created using at least one year of billing data pre-installation to develop a weather normalized billing function (see formula below). The treatment model is created using at least one year of billing data post-installation. Each customer is assigned a weather station, average daily temperature, cooling degree day, and heating degree day summaries to each bill. Degree days are

calculated by summing the number of hours per day by the degrees per hour above or below a temperature break point. For heating degree days, the breakpoint temperature is set at 65 degrees Fahrenheit. Cooling degree days are calculated using 70 degrees Fahrenheit as the breakpoint. Once the necessary data has been created, an autoregressive model is fit to the data for each customer to create the betas necessary to predict data. Each beta represents the multiplier coefficient for the incremental value of each model variable. To forecast or estimate new kWh, multiply the regression betas by the new data.

Weather normalized regression model

$$kWh = (\beta_{daily_kwh} \times Days) + (\beta_{ADT} \times ADT) + (\beta_{CDD} \times CDD) + (\beta_{HDD} \times HDD) + (\beta_{CDD^2} \times CDD^2) + (\beta_{HDD^2} \times HDD^2) +$$

Once the baseline and treatment models have been determined, the model betas are multiplied by ~~weather normal data to create baseline weather normalized bills for each customer.~~ Once the bills have been forecasted, the data is aggregated to create annualized normal energy usage per customer. Each customer has an estimated baseline and treatment annualized kWh. The difference between the estimated baseline and treatment kWh is the energy savings due to the program. The annualized energy estimates are then summarized by participant group and control group, and multiple t-tests are completed to compare the savings of each group, and their pairwise difference.

Once the annualized savings numbers have been calculated, the forecasted bills are used to create monthly and daily load shapes for DSMore. The monthly load shape is created by temporally disaggregating the bills from a cycle month to a calendar month. Traditional load research techniques use linear interpolation method of determining an average energy usage per day per bill, then creating a stepped daily load shape. This method maintains transformation under integration, meaning one can move from cycle month to billing month without loss of accuracy; however the ability to detect peaks using this method is very limited. The second method, utilized in this evaluation, is to create a daily load shape using cubic splines. This method is also closed under integration, and is the preferred method for temporal disaggregation when using SAS (Statistical Analysis Software®). AEP Load Research has done studies comparing the accuracy of both methods in predicting daily load shapes of interval metered customers, and found that the cubic spline disaggregation is more accurate when using goodness-of-fit statistics. However, the primary reason for using cubic splines is the ability to put more load on the peak days of the month. Using the cubic spline method, the forecasted bills are disaggregated to a 365 day daily load shape for each customer. Using the daily load shape, the customers are aggregated using traditional load research methods, to determine a domain load shape. For the HEHP program, there are two domains: Resistance and Replacement.

Next, the peak day history for KPC is used to create a typical peak day for both the summer and winter peak. This is done by averaging the day per year for each year to determine the average day-per-year. As an example, if the last five winter peaks occurred between January 11th and January 15th, it is expected that the average day-per-year peak day will be January 13th. After the typical peak date for the summer and winter peaks has been determined, the KPC Residential Load Research class load shape, as determined by AEP Load Research, is retrieved for each peak date. Using the Residential class load shape, the proportion of energy used at the peak hour, relative to the total energy for the day is determined as a load factor. To determine the summer and winter peaks, the daily energy from the cubic spline disaggregation is divided by the load factor and 24 (hours per day) to determine the average peak demand reduction for each season. The formula is below:

Peak demand reduction formulas

$$kW_s = \frac{kWh_{peakday_s}}{24} \div LF_s \qquad kW_w = \frac{kWh_{peakday_w}}{24} \div LF_w$$

Analysis Results

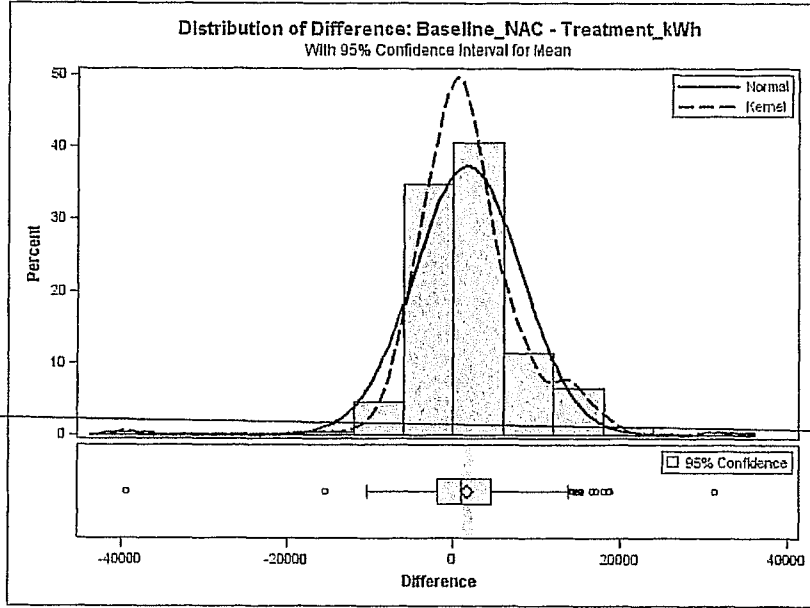
The below graphs contain the summary panel, profile plot, and agreement plot from SAS, created during the PROC TTEST procedure. Particular attention should be paid to the uncertainty of the parameter estimate for the mean. Because of the uncertainty involved in the model, any savings estimate within the Lower Confidence Level (LCL) and Upper Confidence Level (UCL) is within plus or minus two standard errors of the mean. What this means is that the findings of the billing analysis show that the *ex-ante* savings estimate of 4,177 kWh per participant is different from the *ex post* savings estimate to the 95% confidence level. This is not unexpected for a new program using only market potential studies or engineering estimates to determine per-participant savings.

Summary Statistics: By Sub Group

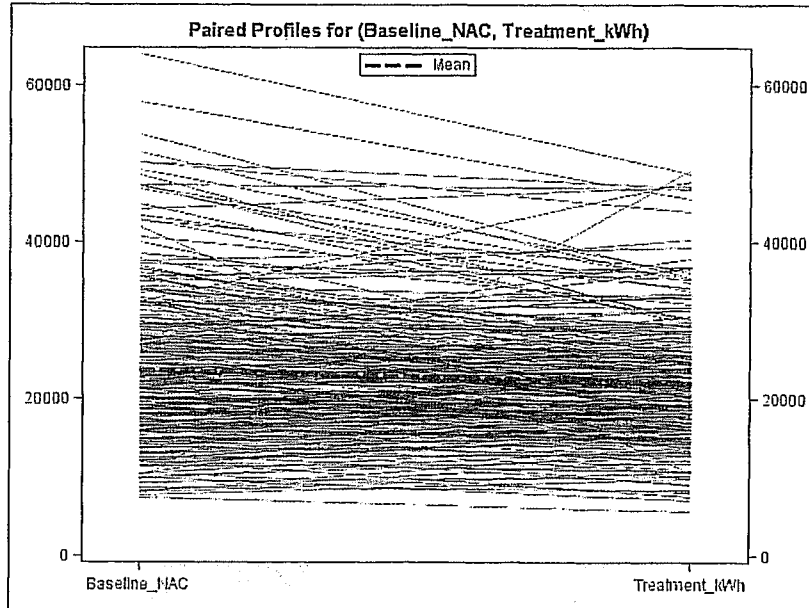
Sub Group	N	Mean	Std Dev	Std Err	95% CI Mean	Summer kW	Winter kW
Replacement	281	1,697.8	6,411.2	382.5	944.9 2,450.7	-0.020	0.590
Resistance	90	1,341.5	7,699.2	811.6	-271.0 2,954.1	-0.140	0.520

Analysis Graphs

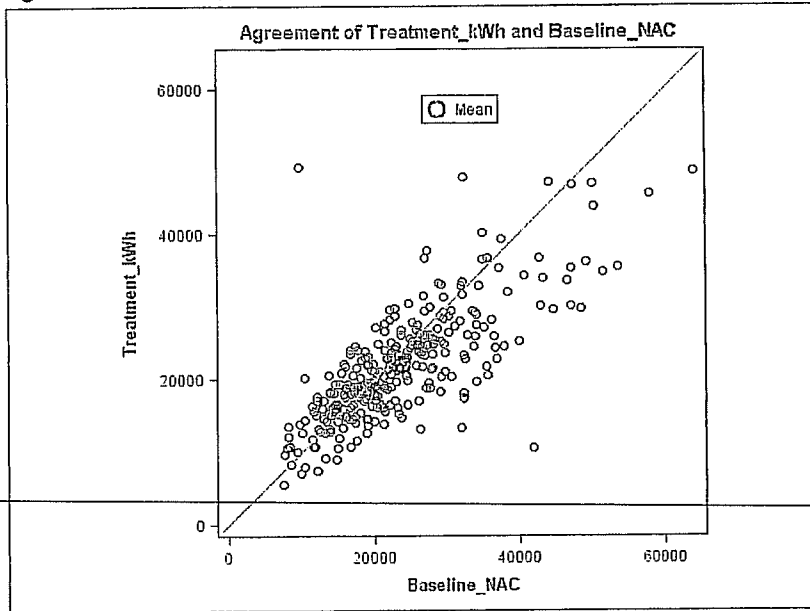
Summary Panel: Replacement Only



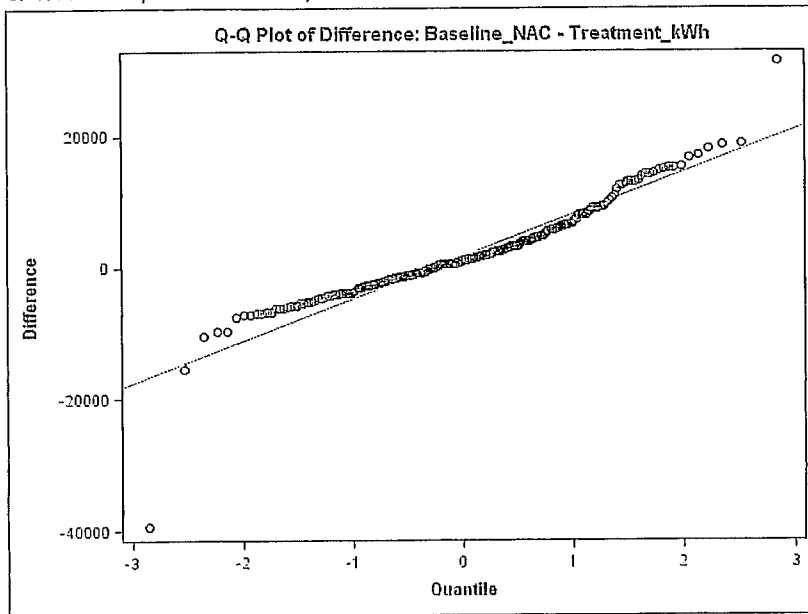
Profile Plot: Replacement Only



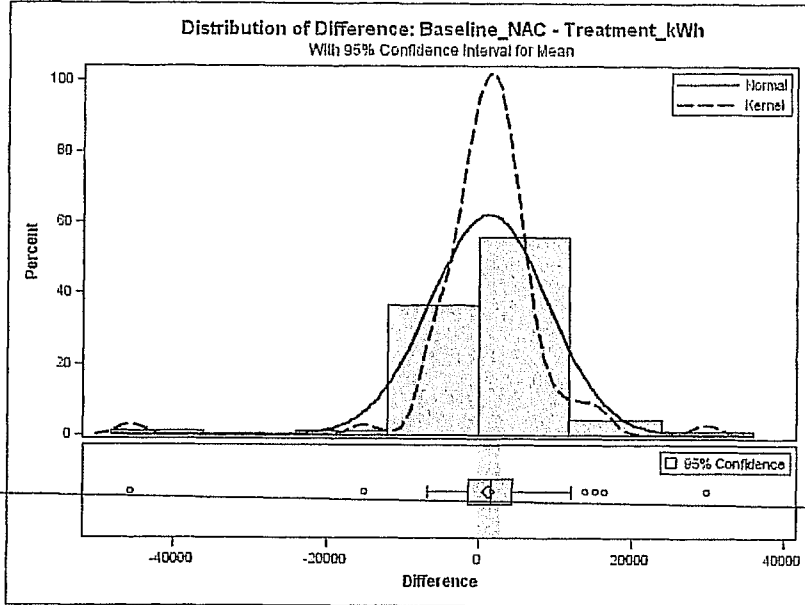
Agreement Plot: Replacement Only



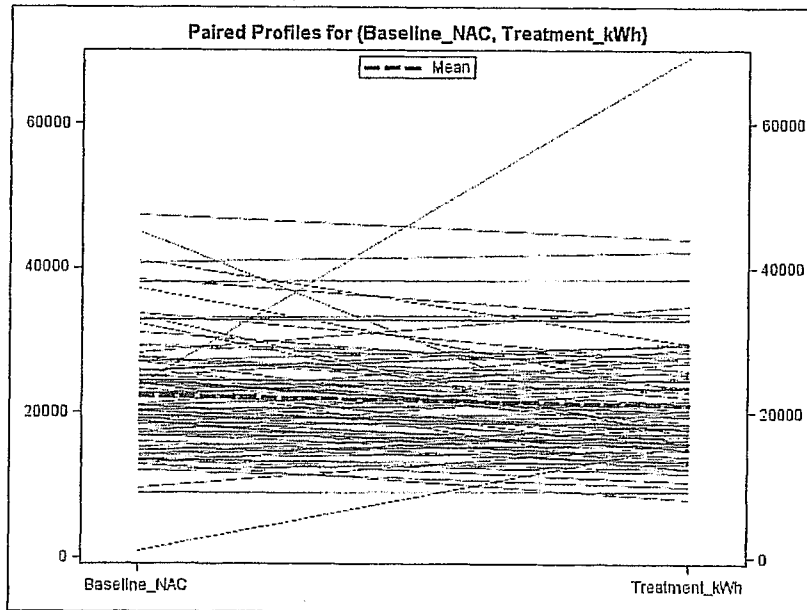
Q-Q Plot: Replacement Only



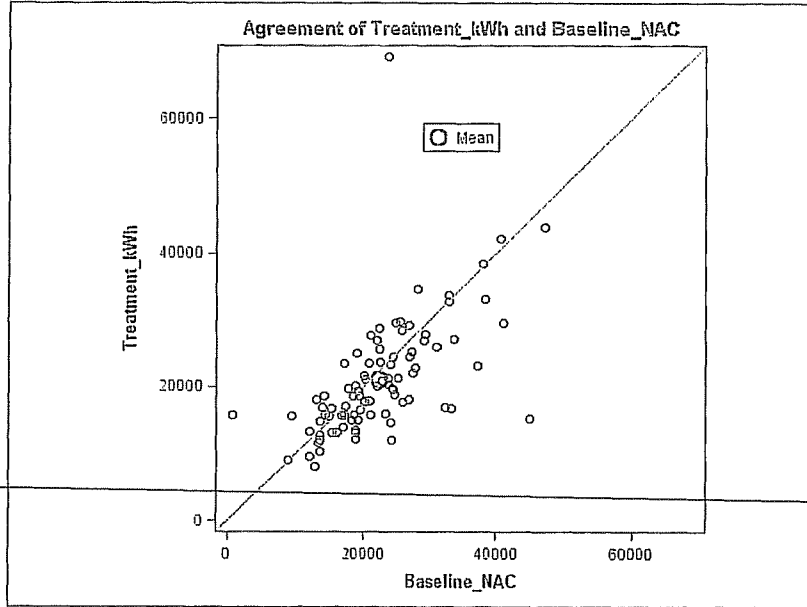
Summary Panel: Resistance Only



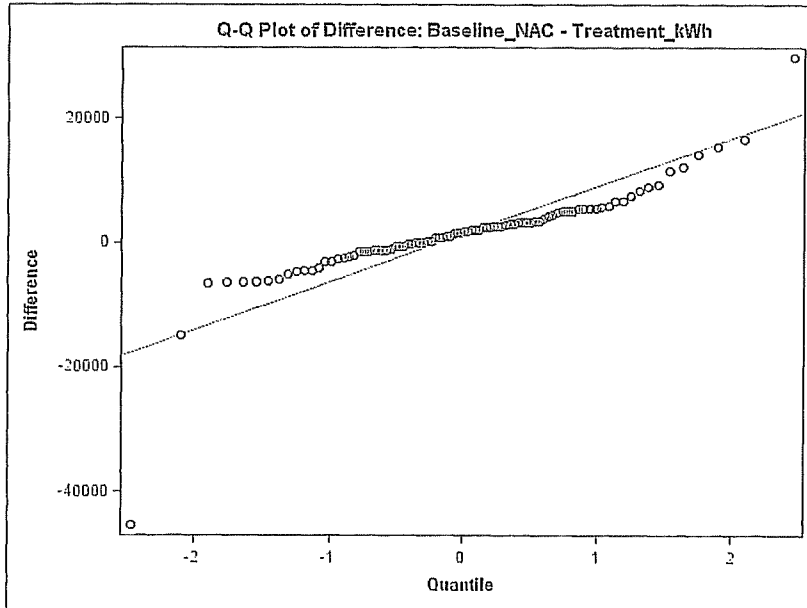
Profile Plot: Resistance Only



Agreement Plot: Resistance Only



Q-Q Plot: Resistance Only



Control Group Analysis

When performing a billing analysis to determine the impacts for program evaluation, the participant group needs to be matched to a set of control customers. For historical analyses, the literature suggests a single control group be matched to the participant list in order to provide a valid set of customers from which to compare. This is done to remove any activities that are related to free ridership: i.e. those activities that would have occurred without the program. However, this author feels that without a robust set of demographic data to make customers comparisons more accurate than AEP's current CIS contains, a billing analysis must treat the control group selection as a replication of quasi-experimental designs. Quasi-experimental design, or "before and after" design, is distinguished by the non-randomness of the control and participant selection groups. However, given the limited demographic data, we substitute the rigorous selection with an increase in replications. Classical statistics (sometimes called Frequentist statistics) is predicated on the notion of repeated trials to infinity, e.g. the relative frequency of a statistics as the trials near infinity. However, in practice, most statistics that is performed is done using a single trial without replication. In many cases, and disciplines, this is an accepted, even celebrated practice. However, in impact analysis of programs, the usage uncertainty and disparity of customer demographics at a premise (number televisions, HVAC usage, work schedule, occupants, etc....) demands that more than one replication be undertaken. Below is the list of control groups generated for this analysis and how each iteration would have compared to the per participant savings calculated in the billing analysis.

Control Group Comparison to Per Participant kWh – Replacement Only

Analysis Group	Baseline Mean	Treatment Mean	Ratio	Per Participant kWh if Chosen	Loss/Gain From Mean
Control_01	23,864	22,775	95.4%	1,405	(293)
Control_02	23,779	23,233	97.7%	1,963	265
Control_03	25,020	23,156	92.5%	694	(1,004)
Control_04	25,936	23,995	92.5%	685	(1,012)
Control_05	24,262	23,448	96.6%	1,703	5
Control_06	24,795	23,736	95.7%	1,477	(221)
Control_07	23,891	23,292	97.5%	1,910	213
Control_08	23,948	23,741	99.1%	2,315	617
Control_09	25,172	24,135	95.9%	1,514	(183)
Control_10	24,554	23,590	96.1%	1,562	(136)
Control_11	24,043	23,008	95.7%	1,468	(230)
Control_12	24,242	23,746	98.0%	2,025	327
Control_13	23,698	23,115	97.5%	1,923	225
Control_14	23,618	23,456	99.3%	2,359	662
Control_15	24,832	24,158	97.3%	1,860	162
Control_16	23,785	23,249	97.7%	1,974	276
Control_17	24,015	23,639	98.4%	2,143	445
Control_18	23,906	23,184	97.0%	1,785	87
Control_19	24,208	23,749	98.1%	2,061	363
Control_20	24,352	23,126	95.0%	1,289	(409)

Control Group Comparison to Per Participant kWh -- Resistance Only

Analysis Group	Baseline Mean	Treatment Mean	Ratio	Per Participant kWh if Chosen	Loss/Gain From Mean
Control_01	23,924	23,235	97.1%	1,488	147
Control_02	22,605	22,284	98.6%	1,827	485
Control_03	23,022	23,712	103.0%	2,851	1,510
Control_04	23,653	23,107	97.7%	1,620	279
Control_05	23,582	22,377	94.9%	972	(370)
Control_06	24,572	22,746	92.6%	433	(908)
Control_07	24,170	24,383	100.9%	2,361	1,019
Control_08	24,071	24,022	99.8%	2,109	768
Control_09	23,012	21,447	93.2%	579	(763)
Control_10	23,062	22,980	99.6%	2,074	733
Control_11	24,156	24,091	99.7%	2,094	752
Control_12	22,899	21,880	95.5%	1,123	(218)
Control_13	24,217	21,774	89.9%	(183)	(1,525)
Control_14	23,053	22,836	99.1%	1,938	596
Control_15	23,623	22,116	93.6%	676	(665)
Control_16	23,672	22,593	95.4%	1,099	(243)
Control_17	23,560	22,606	96.0%	1,217	(124)
Control_18	23,547	21,708	92.2%	345	(997)
Control_19	22,796	21,517	94.4%	855	(487)
Control_20	24,197	23,420	96.8%	1,412	70

Appendix - Engineering Estimates

Estimation Methodology

To calculate annualized energy savings, an average per-measure savings must be determined based on the heating and cooling savings from the increased efficiency of the heat pump. Heating savings are determined by the inverse difference of the Heating Seasonal Performance Factors (HSPF) between the baseline heat pump and the increased efficiency heat pump. Cooling savings are determined by the inverse difference of the Seasonal Energy Efficiency Rating (SEER) between the baseline and upgraded heat pumps. Each savings value is scaled based on the size of the heat pump by tonnage or British Thermal Unit Hours (BtuH) to determine the per-participant, per-year usage. The per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. This number is compared to the billing analysis values to see if the survey free ridership and spillover questions are comparable to the analytically determined values.

Technology Description

A heat pump is a high efficiency year-round heating and cooling system operating entirely on electricity. The system is called a heat pump because it pumps or moves heat from one area to another. The basic components of a heat pump are a compressor; circulating fluid (refrigerant); and two heat exchangers, one outside and one inside. In winter, heat is extracted from cold outdoor air even when the temperature is well below freezing. The heat is absorbed by the refrigerant, and then is pumped through the compressor to the indoor coil (heat exchanger) where the refrigerant releases its heat to the indoor air. Since there is less heat available at low outdoor temperatures, the heat pump system includes a supplemental resistance heater that automatically provides additional heat when the outdoor air temperature is too low for the heat pump compressor to supply the home's total heating demand. In the summer, the heat is absorbed by the refrigerant in the indoor coil from the circulating indoor air. The heat-laden refrigerant from the indoor coil is pumped to the outdoor coil where the heat is transferred to the outdoor air. The heat pump system is the most efficient way to heat and cool electrically. The most significant energy savings are obtained during the heating season since it utilizes the "free" heat that already exists in the outdoor air. The heat pump energy efficiency is determined by the seasonal energy efficiency ratio (SEER) for summer and the heating seasonal performance factor (HSPF) for winter.

Algorithms

$$kWh = \left[\left(FLH_{cool} \times \frac{BtuH}{1000} \times \left(\frac{1}{SEER_{base}} - \frac{1}{SEER_{ee}} \right) \right) + \left(FLH_{heat} \times \frac{BtuH}{1000} \times \left(\frac{1}{HSPF_{base}} - \frac{1}{HSPF_{ee}} \right) \right) \right]$$

$$kW = \frac{\left(BtuH \times \left(\frac{1}{EER_{base}} - \frac{1}{EER_{ee}} \right) \right)}{1000} \times CF$$

Terms

Term	Description
kWh	Energy Savings
kW	Demand Savings
FLH _{cool}	Full Load Cooling Hours by closest weather related large city
FLH _{heat}	Full Load Heating Hours by closest weather related large city
BtuH	Size of equipment in British Thermal Unit Hours
SEER _{base}	SEER efficiency of baseline unit
SEER _{ee}	SEER efficiency of installed unit
HSPF _{base}	Heating Season Performance Factor for baseline unit
HSPF _{ee}	Heating Season Performance Factor for installed unit
EER _{base}	EER efficiency of baseline unit
EER _{ee}	EER efficiency of installed unit
CF	Coincidence Factor

Validation Rules

Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis (or the end of the measure's expected life).
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Resistance Free Ridership	38%
Replacement Free Ridership	29%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%
Measure's expected life in years	15
Fully Loaded Cooling Hours	1,150
Fully Loaded Heating Hours	1,975
Summer Coincidence Factor	0.7
Winter Coincidence Factor	0.5

Appendix – Exhibits

Exhibit 1 – Bill Insert

**MAKE A DIFFERENCE
BY GOING PAPERLESS**

GOING GREEN?
GO PAPERLESS!

Kentucky Power customers are going green by switching to paperless billing. Help the environment by having your bill delivered via e-mail, saving paper and saving trees. Sign up for paperless billing at www.AEPPaperless.com.

Last year over 260,000 residential AEP customers received their bills electronically, making a significant impact on the environment.

Collectively, these AEP customers saved:

- ♻ 2,072 trees
- ♻ 89 tons of paper
- ♻ 500,000 pounds of greenhouse gases
- ♻ 200,000 pounds of solid waste
- ♻ 1.6 million gallons of wastewater

Sign up for paperless billing at: www.AEPPaperless.com

Environmental impact estimates were made using the Environmental Defense Fund Paper Calculator. For more information, visit www.papercalculator.org.

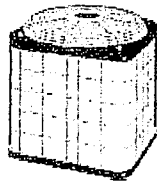
**AEP KENTUCKY
POWER**
A unit of American Electric Power
KentuckyPower.com

CASH INCENTIVES FOR NEW, HIGH-EFFICIENCY HEAT PUMPS

Kentucky Power will pay residential customers \$400 to replace an existing heating and cooling system with a new high-efficiency heat pump.

High-Efficiency Heat Pump Program

Homeowners can upgrade their electric resistance heating system with a new high-efficiency heat pump unit and receive \$400 from Kentucky Power. Qualified heat pumps must meet the following requirements:



- A Seasonal Energy Efficiency Ratio (or SEER) rating equal to or greater than 13.
- A Heating Seasonal Performance Factor (or HSPF) equal to or greater than 7.7.

Already have an electric heat pump? We'll also offer you \$400 to upgrade your unit. Qualified heat pumps must have:

- A SEER rating equal to or greater than 14.
- A HSPF equal to or greater than 8.2.

Mobile Home Heat Pump Program

Residential customers who live in a mobile home can also receive \$400 for upgrading their electric resistance heating system with a new, high-efficiency heat pump unit. The heat pump must feature a SEER rating equal to or greater than 13 and an HSPF equal to or greater than 7.7.

Though these products can be more expensive to purchase up front, the cost difference will be paid back over time through lower energy bills.

For more information, call our Customer Solution Center at 1-800-572-1113. You can also contact your local licensed HVAC dealer for details.

Exhibit 2 – Fact Sheet

**AEP KENTUCKY
POWER**

A United American Electric Power

High Efficiency Heat Pump Program Fact Sheet

Program Overview

Is your current heating and cooling system inefficient, more than 5-10 years old or in need of replacement? If so, Kentucky Power's High Efficiency Heat Pump Program can help you offset the cost of upgrading to a new, high efficiency heat pump system.

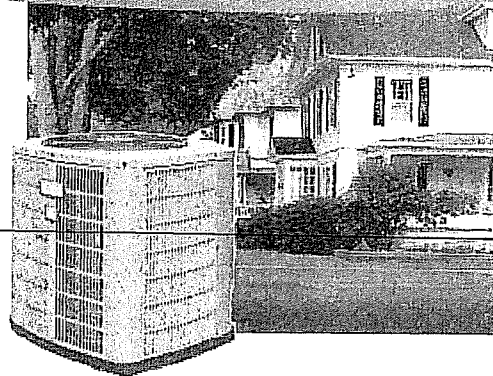
Simply put, a heat pump is an air conditioner that is able to reverse cycle to provide heating. It is an efficient and economical way to heat and cool your home using electricity. It's also a wise energy investment for homeowners that can help reduce your monthly electric bills without sacrificing comfort.

The High Efficiency Heat Pump Program provides a \$400 incentive when you upgrade your electric resistance heating system with a new, high efficiency heat pump unit. The new heat pump must have a minimum rating of 13 SEER (Seasonal Energy Efficiency Ratio) and a 7.7 HSPF (Heating Seasonal Performance Factor) to qualify.

The \$400 incentive is also available if you upgrade from an older, less efficient heat pump to a high efficiency heat pump unit. Heat pumps rated at a minimum 14 SEER and 8.2 HSPF qualify.

Customer Eligibility

All Kentucky Power residential customers who currently use an electric resistance heating system or heat pump are eligible to participate.



How to Participate

Call our Customer Solution Center at 1-800-572-1113 or contact a local, licensed HVAC dealer that participates in the Kentucky Power Demand Side Management SMART Programs. Kentucky Power recommends getting at least two price quotes and does not endorse any particular heating and cooling professional.

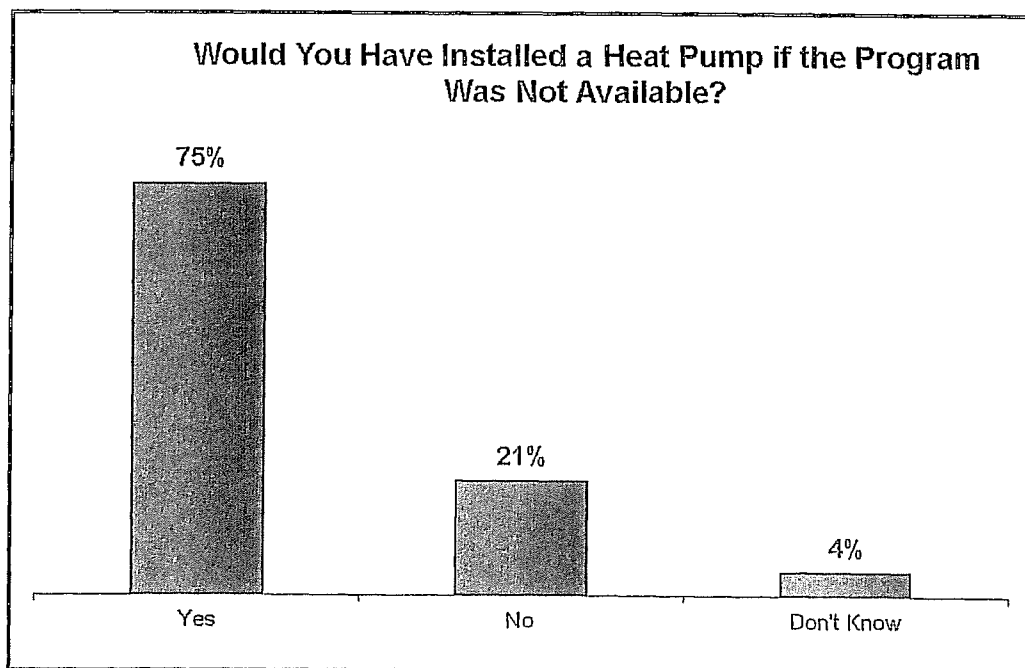
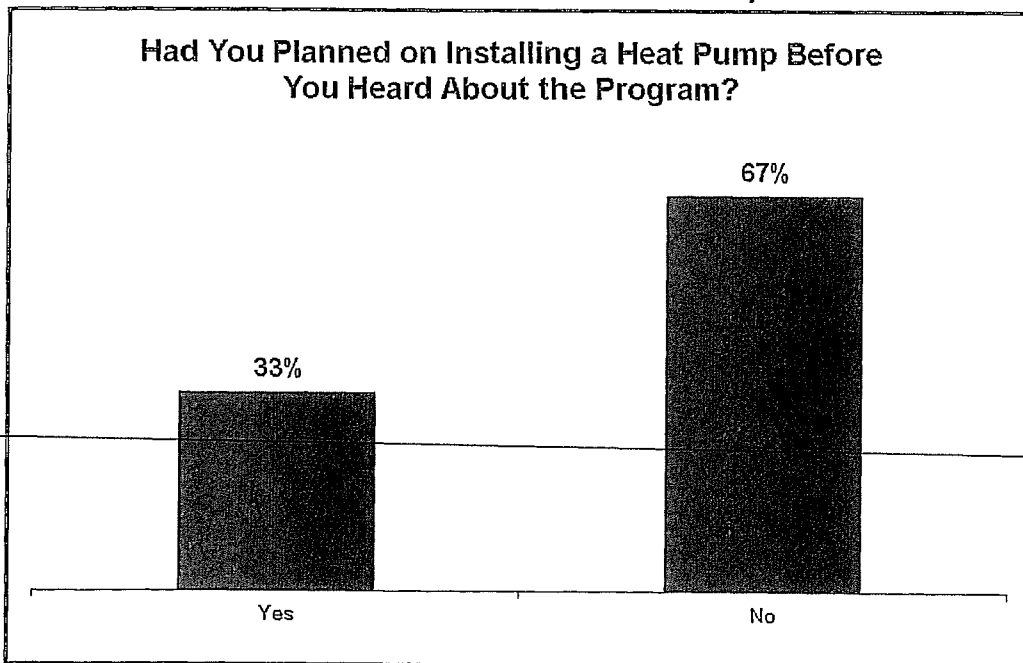
Other Opportunities

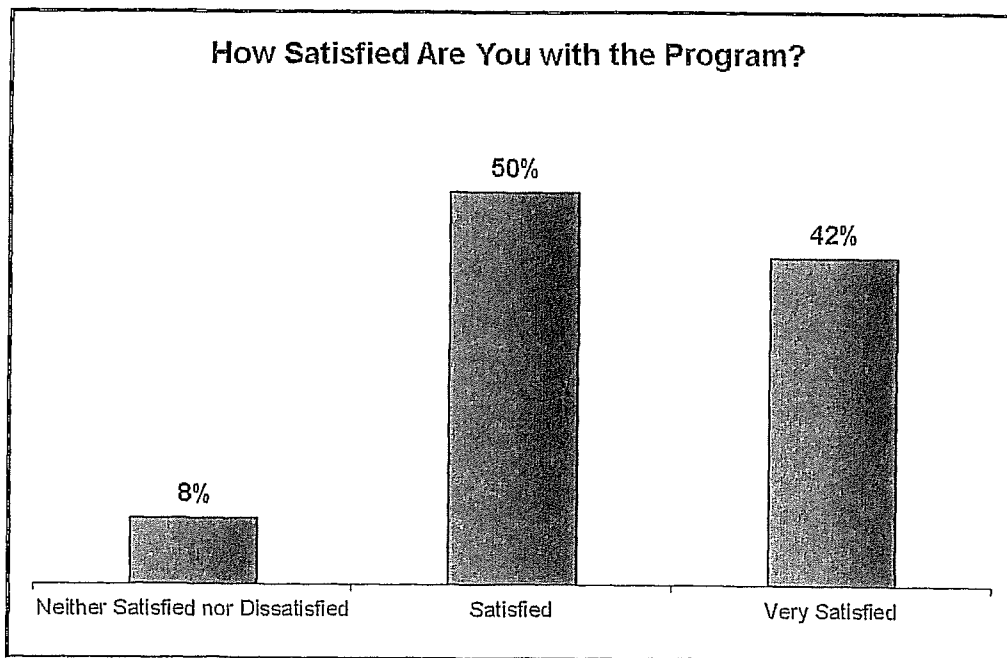
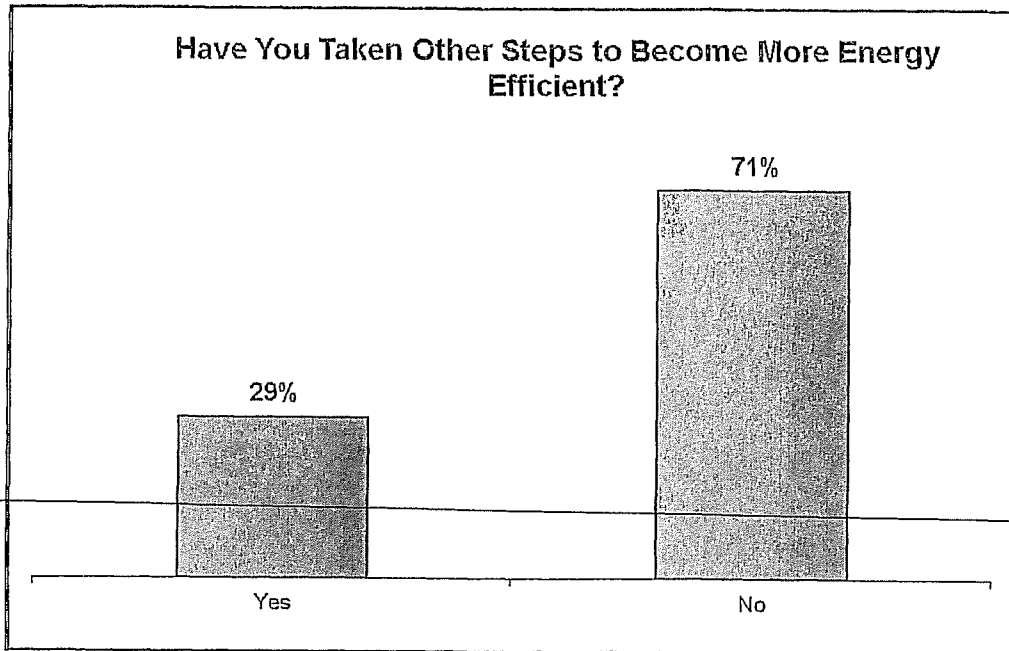
Kentucky Power offers a suite of SMART Programs, which are energy efficiency programs for homes, businesses and schools. For more information on this program or other SMART Programs, call 1-800-572-1113 or visit KentuckyPower.com/save.

SMART Programs – Saving Money And Resources Together²

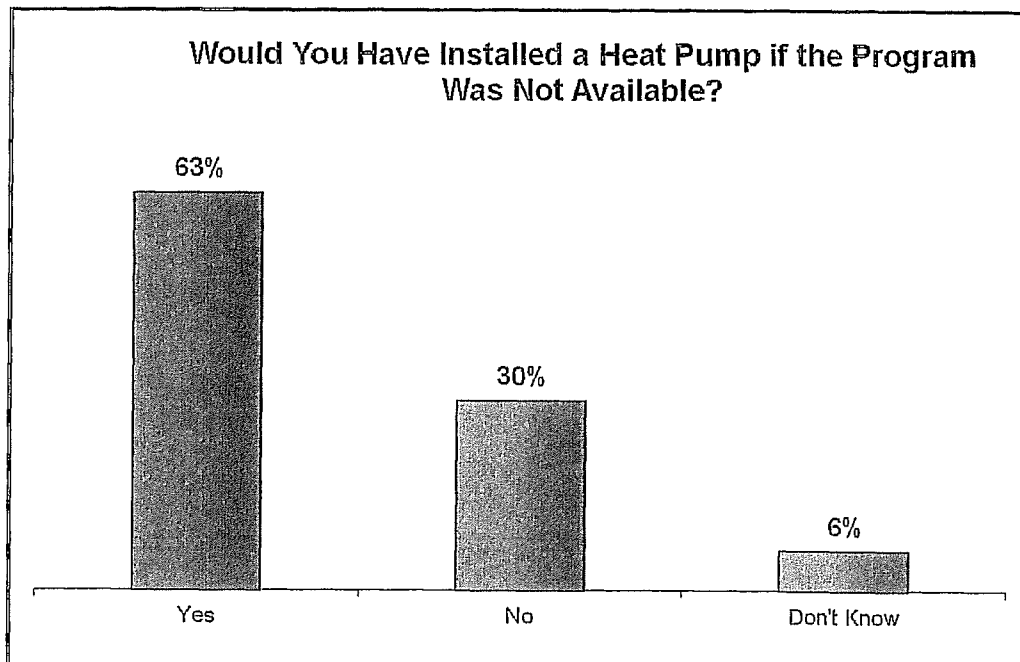
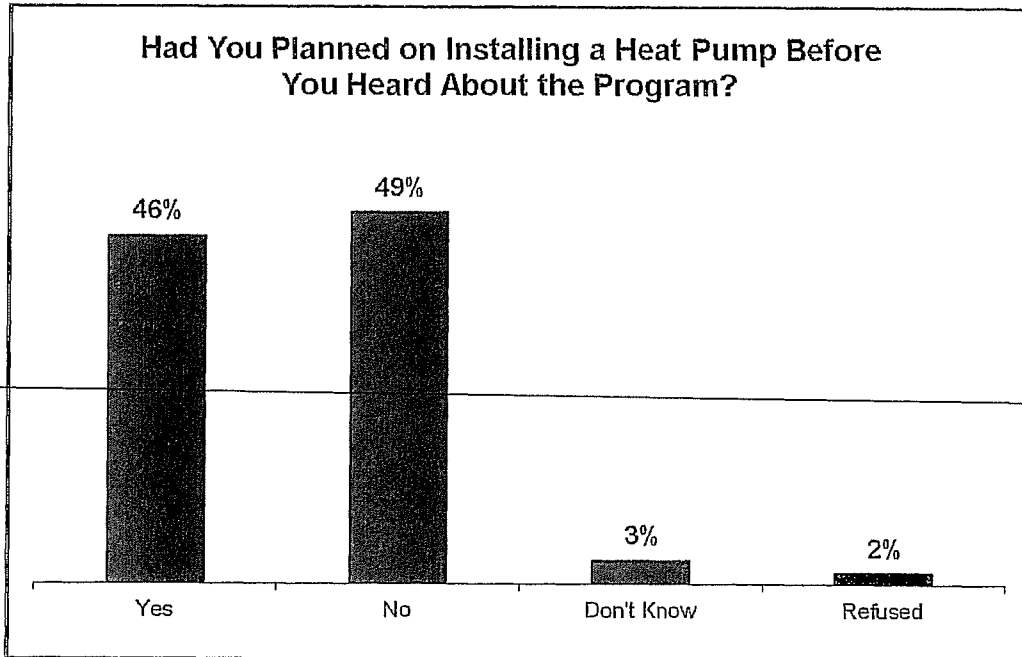
gridSMART[®]
From Kentucky Power

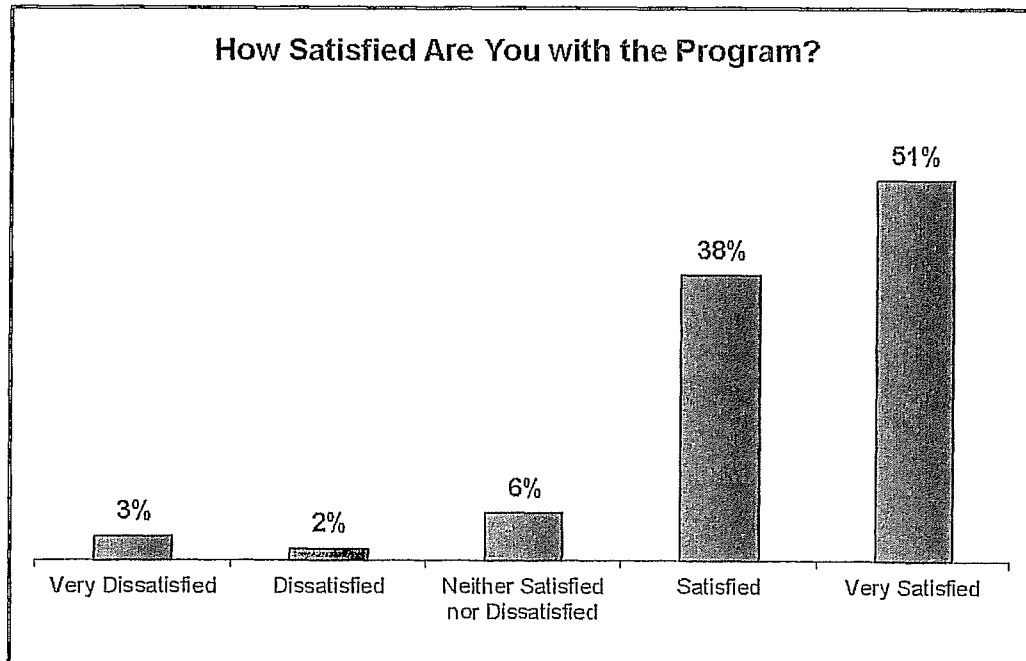
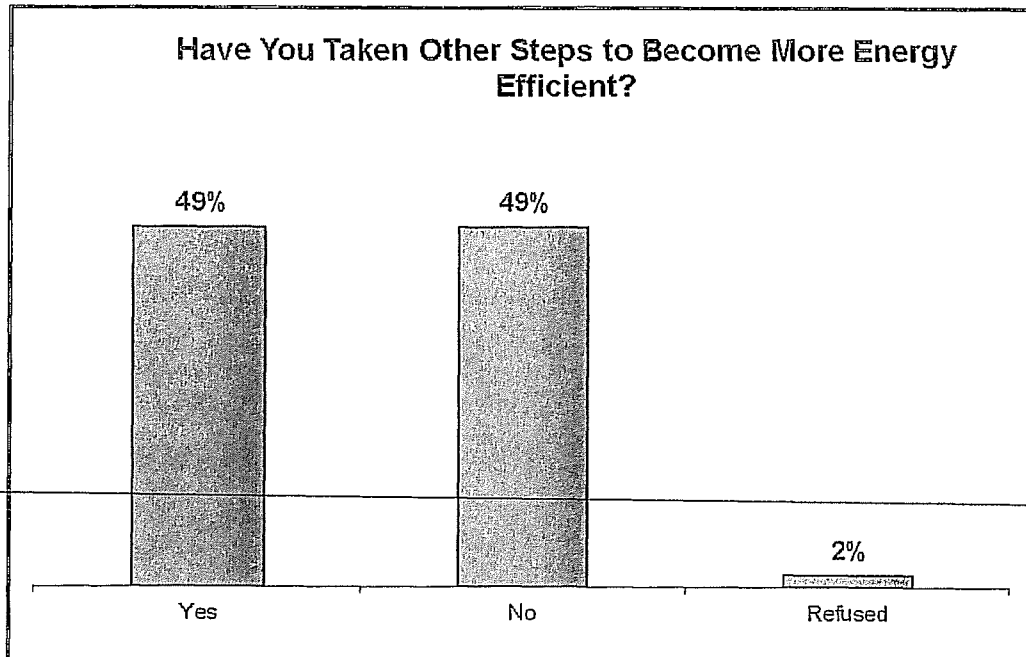
Appendix – Resistance Survey





Appendix – Replacement Survey





Appendix – Heat Pump Dealers

A W R
77 Cow Hollow
Drift, KY 41619
(606) 377-9730

Aire Serv
2106 1/2 13th Street
Ashland, KY 41101
(606) 324-1033

Appalachian Refrigeration
P. O. Box 400
Avawam, KY 41713
(606) 436-0682

B & B Heating & Cooling
P. O. Box 308
Harold, KY 41635
(606) 478-9400

Bobby Howard & Sons
P. O. Box 38
Whitesburg, KY 41858
(606) 633-9580

**Burcheff's Heating & Air
Conditioning**
P. O. Box 665
Wittensville, KY 41274
(606) 297-6224

**Cadco Heating & Air
Conditioning**
2181 Winchester Avenue
Ashland, KY 41101
(606) 928-3041

Clay's Heating & Cooling
P. O. Box 1764
Prestonsburg, KY 41653
(606) 874-2256

AAA Heating and Air Cond.
340 Amos Newsome Ln
Virgie, KY 41572
(606) 639-6860

American Heating & Cooling
P. O. Box 4321
Pikeville, KY 41502
(606) 639-4307

**Ar-iron Heating & Air
Conditioning**
2744 Roberts drive
Ashland, KY 41101
(606) 920-9700

Big Sandy Heating & Cooling
P. O. Box 330
Hager Hill, KY 41222
(606) 297-4328

Breathitt Plumbing & Heating
1261 Main Street
Jackson, KY 41339
(606) 666-4313

C & H Heating & Air Conditioning
P. O. Box 946
Flatwoods, KY 41139
(606) 833-1995

**Caldwell Heating & Air
Conditioning**
9630 Grandview Lake Road
Ashland, KY 41102
(606) 928-3618

Coleman Heating & Cooling
P. O. Box 580
Regina, KY 41559
(606) 754-5763

Adams Heating & Cooling
P. O. Box 719
Delbarton, WV 25670
(304) 475-3878

Appalachian Htg & Cooling
P. O. Box 4141
Pikeville, KY 41502
(606) 422-5643

Ashland Furnace
2700 Winchester Avenue
Ashland, KY 41101
(606) 325-3211

Blanton Heating & AC
135 Railroad Street
Dwale, KY 41621
(606) 874-0130

Breeding's Plumbing & Electric
P. O. Box 86
Isom, KY 41824
(606) 633-5961

C.N.C. Services
895 Nebo Road
Cattlettsburg, KY 41129
(606) 686-2298

Casile Heating & Cooling
5917 Bybee Road
Ashland, KY 41102
(606) 928-1148

Cox Commercial
149 Clover lane
Greenup, KY 41144
(606) 473-1016

Crab Mechanical Services Inc
621 3rd Street
Portsmouth, OH 45662
(740) 355-5300

Dils & Company
2359 Town Mountain Road
Pikeville, KY 41501
(606) 437-4609

Elliott Supply & Glass, Inc.
P. O. Box 3038
Pikeville, KY 41502
(606) 437-7368

Cullop's Heating & Cooling
P. O. Box 2637
Williamson, WV 25661
(606) 237-4823

East Hills Heating & Cooling
P. O. Box 135
Ivel, KY 41642
(606) 226-4593

**Fannin's Plumbing Heating
& Electric Company, Inc.**
432 Main Street
Paintsville, KY 41240
(606) 789-3696

Delta Supply Heating & Cooling
455 Hambley Blvd.
Pikeville, KY 41501
(606) 432-0787

Elite Comfort HVAC Inc
8192 KY 1261
Campton, KY 41301
(606) 272-7141

Fletcher Services
1572 Ratliff Creek Rd
Pikeville, KY 41501
(606) 433-1151

Frederick & May Lumber & Supply
P. O. Box 218
West Liberty, KY 41472
(606) 743-3136

Grayson Mechanical HVAC
405 Robert & Mary Street
Grayson, KY 41143
(606) 474-4550

HCE Systems Inc.
P. O. Box 879
Norton, VA 24273
(276) 679-5829

Huff's HVAC
P. O. Box 547
Cornettsville, KY 41731
(606) 476-2942

Kentucky Wide Htg & Clg
P.O. Box 384
Thelma, KY 41260
(606) 424-5684

Maggard's Heating & Cooling
140 County Line Branch
Garrett, KY 41630
(606) 358-2466

G & W Heating & Cooling
273 Paul Road
Wurland, KY 41144
(606) 922-8402

Griffith Plumbing & Heating
338 Broadway
Jackson, KY 41339
(606) 666-2316

HELP Air Conditioning & Htg
731 E. Main St.
Grayson, KY 41143
(606) 475-0826

Imperial Heating & Cooling
P.O. Box 526
Ashland, KY 41105
(606) 324-0610

Lafferty Heating & Cooling
P. O. Box 208
Dwale, KY 41621
(606) 874-9357

Marco Heating & Cooling
P. O. Box 585
Hyden, KY 41749
(606) 672-2431

**General Heating & Air
Conditioning**
P. O. Box 964
Flatwoods, KY 41139
(606) 836-8143

Hatton Heating & Cooling
69 Beagle Road
Whitesburg, KY 41858
(606) 632-2790

Howard's Heating & Air
P. O. Box 569
Baxter, KY 40806
(606) 573-2944

KB HVAC
145 Shady Creek
Greenup, KY 41144
(606) 923-7534

Mabry's Heating & Cooling
2423 Greenbriar Rd
Olive Hill, KY 41164
(606) 286-6007

Miller's Heating & Cooling
3752 Stone Coal Rd
Pikeville, KY 41501
(606) 432-9599

Mooney's Heating & Cooling
P. O. Box 1313
Inez, KY 41224
(606) 298-4784

Mulvaney & Son's Inc.
P. O. Box 368
Cattlettsburg, KY 41129
(606) 739-4042

Patterson Repair Services, Inc.
4264 Marsh Hill Dr
Cattlettsburg, KY 41129
(606) 571-1715

Pike's Heating & Cooling
490 Steerfork Road
Mallie, KY 41836
(606) 785-9430

Prahn's Heating & Cooling
317 Upper Doty Branch
Happy, KY 41746
(606) 476-9690

Quality Air Conditioning & Heating
P. O. Box 751
Pound, VA 24279
(276) 796-5366

Randy Suttles General Construction
208 Miranda Lane
Grayson, KY 41143
(606) 474-9286

Ray Brown Inc.
726 National Ave.
Lexington, KY 40502
(859) 278-0281

Roosevelt's Heating & Cooling
26595 Highway 32
Martha, KY 41159
(606) 652-4972

Roy's Electric Repair
4802 Roberson Road
Ashland, KY 41101
(606) 833-8019

Scurlock Heating & Cooling
1005 Woodland Drive
Paintsville, KY 41240
(606) 788-9188

Service Incorporated
800 Old Flemingsburg Road
Morehead, KY 40351
(606) 784-4918

Shelton Heating & Air
560 Shelton Dr.
Eolia, KY 40826
(606) 632-9542

Slone's Heating & Refrigeration
P. O. Box 82
Regina, KY 41559
(606) 432-3912

Smith Heating, Cooling & Electric
P. O. Box 1594
Hazard, KY 41702
(606) 439-4874

Tennell Refrigeration
157 One Mile Branch
Hyden, KY 41749
(606) 672-5252

Thompson Heating & AC
6858 Mockingbird Trail
Cattlettsburg, KY 41129
(606) 739-6880

Todds Refrigeration
456 Pine Frk
Shelbyanna, KY 41562
(606) 437-5320

Tony's Electrical HVAC
P. O. Box 228
Melvin, KY 41650
(606) 452-4394

Tri-County Heating & Air
P. O. Box 108
Salysersville, KY 41465
(606) 349-2308

Tri-County Heating & Air
P. O. Box 108
Salysersville, KY 41465
(606) 349-2283

Tri-State Heating & cooling
P. O. Box 65
Banner, KY 41603
(606) 874-5472

Webb's Heating & Cooling
P. O. Box 146
Lowmansville, KY 41232
(606) 673-3050

Williams Electric
P. O. Box 635
Salysersville, KY 41465
(606) 349-1234

Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
aragraves@aep.com

Joseph Chambers
Contractor
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kjvass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrnicek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com



Evaluation Report

Kentucky Power Company Community Outreach CFL

Evaluation Report for 2009-2010

July 2011

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	7
Summary	7
Promotional Effectiveness.....	7
Delivery Mechanism	7
Data Tracking.....	8
Survey	8
Product Awareness.....	9
Free Riders and Spillover.....	9
Market Potential	9
Customer Satisfaction	9
Impact Evaluation	10
Impact Results.....	12
Cost Effectiveness Evaluation.....	13
Prospective Analysis.....	15
Recommendations.....	16
References	17
Appendix - Impact Methods and Assumptions	18
Impact Methods.....	18
Technology Description	18
Algorithms	18
Terms	18
Validation Rules	19
Assumptions.....	19
EISA Discounts	19
Appendix – Exhibits.....	20
Exhibit 1 – Sample Newspaper Advertisement.....	20
Exhibit 2 – Some Facts About CFL	21
Exhibit 3 – Fact Sheet: Mercury in CFLs.....	22
Appendix – Survey Results.....	23
Appendix – EE/DR Analytics Team Members	41
Load Research.....	41
EE and Consumer Programs.....	41
Marketing.....	41

Executive Summary

The objective of the Kentucky Power Company's (KPC) Community Outreach Compact Fluorescent Lighting (CFL) Program (COCFL) is to promote the conservation and efficient use of electricity by encouraging the use of energy efficient ENERGY STAR® CFLs in place of incandescent light bulbs. Qualified customers in targeted communities receive a package of four ENERGY STAR® CFLs along with energy education materials. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. For 2009 and 2010, the COCFL program distributed 34,220 CFLs to 8,555 KPC customers, providing 2,119 MWh of net annualized energy savings, 448 kW of summer peak demand reductions, and 417 kW of winter peak demand reductions. The process evaluation concluded that the promotion and delivery processes were effective, that there was a sizable market for CFLs, and that the program provided excellent customer satisfaction.

Based on the results of the evaluation, the COCFL program was determined to be cost-effective under the three of the cost-benefit tests used in the California Standard Practice Manual and KPC should continue to utilize the program through the remainder of the current program life (2011). The prospective analysis of the program for 2012-2014 predicts the program will be cost-effective, and it is recommended that the program continue.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio	Winter Peak Ratio
Program Administrator Cost (PACT)	3.51	3.47
Total Resource Cost (TRC)	4.23	4.17
Ratepayer Impact Measure (RIM)	0.53	0.52
Participant Cost (PCT)	N/A	N/A

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	2.73
Total Resource Cost (TRC)	3.91
Ratepayer Impact Measure (RIM)	0.62
Participant Cost (PCT)	N/A

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Community Outreach Compact Fluorescent Lighting (CFL) program was developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on February 24, 2009 (Case No. 2008-00349) to help meet Kentucky Power's goals.

The major goals of the program are to:

- 1) Provide education to customers as to the proper application of high efficiency CFLs
- 2) Encourage the use of energy efficient lighting in their homes
- 3) Reduce customer usage of electric energy
- 4) Increase customer satisfaction and services
- 5) Reduce Kentucky Power's long-range peak demand.

The Community Outreach CFL Program was designed as both an education program and a program to increase the adoption of energy efficient lighting in residential homes. KPC worked in selected communities to provide education materials to KPC customers and a package of four (4) ENERGY STAR® qualified CFLs. This provided participating KPC customers with a better understanding of the purpose and benefits of installing energy efficient CFLs in their homes and increased their awareness of the capabilities and direct savings of CFLs.

The lower wattage of CFLs versus the higher wattage of incandescent bulbs to attain the same level of lumens reduces energy consumption, which in-turn lowers the customer's monthly electric bill, and provides both energy and demand savings to KPC. Additionally, the life of the high-efficiency CFLs exceeds that of the incandescent lamps by about a factor of ten, thus reducing equipment costs and adding another benefit of using this energy conservation measure in a customer's home. Although, today's higher purchase price could still be considered somewhat of a barrier which prevents customers from purchasing a CFL versus an incandescent bulb, this barrier is less overwhelming than in previous years, and can be overcome with additional education regarding the financial benefits of CFLs. Historically, CFLs were limited to specific home lighting applications, but improving CFL technology has created more applications for the use of CFLs.

Despite the increased availability and applicability of CFLs, there are still significant numbers of customers in their service territory that are not aware of the many benefits that CFLs provide. KPC believes that education related to the improved technology of energy efficient products, such as CFLs, can have a significant benefit if targeted to communities within its service territory. This Program

provides an effective and direct avenue to reach customers via the direct distribution of energy efficiency CFLs in selected communities.

Process and Market Evaluation

Summary

KPC utilized community outreach activities to administer the Program to deliver educational materials and a four-pack of ENERGY STAR® qualified CFLs to each qualified customer. The Program promotion was effective, as evidenced by the achievement of goals within the scheduled number of events. The delivery mechanism was effective in that incremental delivery costs were minimal, only KPC customers received the program benefits and a face-to-face opportunity was provided for customers to ask questions of KPC staff. No significant barriers to participation were identified. The KPC staff had access to customer account information at the events, allowing potential participants to prove KPC customer status simply by providing name and address. The customers had significant incentive to participate, because they received a four-pack of ENERGY STAR® qualified CFLs, education materials, and potential savings with their electric bill as a result of decreased lighting usage. The survey showed that free ridership was unremarkable. KPC reached the customer participation goal in a cost-effective manner and received excellent customer satisfaction ratings.

Promotional Effectiveness

The 2009 promotional materials, primarily local radio and newspaper ads, were effective in that the response produced 3,744 participants, greater than the 2009 participant goal of 3,500, for a 107% sign-up result. In 2010, an additional promotional tool using targeted telephone messaging to inform customers of upcoming community events was added. Also, a large sign was added in 2010 to further attract potential participants to attend the event. The sign increased the effectiveness of the program, as more participants were reached at each event, permitting the increased goal of 4,800 participants to be achieved without adding significantly more events. In addition, Program management began cross-promoting other KPC Energy Efficiency Programs at the community event, potentially drawing additional participants and additional energy savings to those programs.

Delivery Mechanism

The program delivery was performed by KPC staff attending community events and physically handing out each four-pack of ENERGY STAR® qualified CFLs along with energy education materials to verified KPC customers. The efficiency of the delivery was improved upon in 2010 through an improvement in logistics for the physical delivery of the CFLs to the event location, resulting in multiple trips being condensed into a single trip per event. Adequate care was exercised to assure that only KPC customers received direct benefits from the program. Requiring a valid KPC account number was the preferred method of ensuring this, but in cases where the customer did not have that information they

were able to provide name and address and KPC program management was able to perform on-site verification of customer status by referencing a customer list on a laptop.

Data Tracking

While at the community outreach events, KPC staff collected data on each customer, including the customer's name, account number, telephone number, CFLs provided to the customer and the county where the customer resides. KPC staff utilized a spreadsheet to record the information from the participants in the Program. There were a few shortcomings in the data tracking area as pertinent pieces of information were spread across multiple organizations and multiple formats. The implementation spreadsheet contained most of the necessary information needed to perform an impact analysis, but was missing important items such as the date the CFLs were distributed and bill account numbers in the format of the KPC customer information system. KPC staff also did not have a good way of tracking expenditures by type. When pulled from the AEPSC ledger, only two types of expenditures were found, and the descriptions used were lacking of detail. Cost descriptions for evaluation could not be verified in the general ledger, and so estimated costs from KPC staff had to be used. Finally, errors were found in the spreadsheet used to determine estimated energy savings. The average per-participant savings numbers used were actually one-fourth the amount they should have been due to the savings numbers being based on a single CFL, not the four-pack being handed out by KPC staff.

Survey

The participant follow-up survey was designed to collect, from a randomly selected sample of participants, the information necessary to perform the program impact evaluation and the process and market evaluations. The survey was conducted using a telemarketing process. For the sample selection, the original list of 3,744 participants was reduced to 2,589 due to missing or incorrect phone numbers and/or duplicate or now inactive customer account numbers. The information collected for the impact evaluation included the number of CFLs actually installed in the participant's home, the size (wattage) of the incandescent bulbs replaced, whether the installed CFLs were still in place, an estimate of how many hours and time of day they are normally operating and the locations in the home at which the CFLs were installed. The information collected for the process and market evaluations included whether the participants were already installing CFLs in their homes, whether they would have purchased CFLs in lieu of the Program, their satisfaction with the Program, and the use of the CFLs in their homes. Thoroughbred Research Group was hired to conduct a telemarketing survey for 255 Program participants to provide results at a 90% confidence level with +/- 5% error. The questionnaire and results of the telemarketing participant survey are included in the Appendix.

Product Awareness

The Participants' pre-program awareness of energy efficient CFLs was not high, with 47% of the participants surveyed having used CFLs in their home prior to the Program, and 53% of the participants surveyed having not previously used CFLs in their home.

Free Riders and Spillover

A free rider is a participant who utilized the provided CFLs, but would have purchased and installed equivalent CFLs had they not participated in the Program. Spillover refers to additional CFLs purchased by participants as a result of the program. From the survey responses, 27% of participants indicated they would have purchased and installed equivalent CFLs without the program and thus were classified as likely free riders in this program. The survey results also indicated that 22% of participants purchased additional CFLs since participating in the Program, providing a potential spillover effect and potentially providing additional energy savings. The authors of this report had some concerns with the survey wording; therefore, to stay conservative, the 27% free rider response was used for the impact analysis and the spillover effects were ignored.

Market Potential

Based on the responses to the 2010 Residential Appliance Saturation Survey, it was determined that 13% to 25% of rooms in KPC customer's homes utilize some CFLs as a source of lighting. The top three locations in the home where CFLs were the main source of lighting were the kitchen, living room and master bedroom, respectively. For all the locations in the home it can be said that three to six times more customers are still using incandescent bulbs for their main source of lighting. Therefore, there continues to be a significant market opportunity to promote energy efficient CFLs in the KPC service territory.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was very high, with 97% of the respondents being "very satisfied" (61%) or "satisfied" (36%) with receiving the energy efficient CFLs and also 97% of the respondents were "very satisfied" (68%) or "satisfied" (29%) with the Program overall. Only 1% of the respondents surveyed expressed dissatisfaction with the CFLs and the Program, stating reasons such as the CFLs had a shorter life than expected, the light output was inadequate, or that they received an insufficient quantity of CFLs. The survey results also indicated that 7% of the respondents removed their CFLs from their home, mainly due to lamp failure, while another 15% of the respondents never installed their CFLs because they did not believe they had an appropriate location to place them in their home.

Impact Evaluation

The evaluation began with an engineering estimate analysis of the implementation data collected by KPC. The engineering estimates were used to develop gross measure savings without post-consumption data or a billing analysis. A billing analysis was not performed because the magnitude of impacts in a CFL program falls within the normal bill variability. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. For Net-To-Gross calculations, survey results provided a basis for net savings estimates.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. For 2009, 3,744 customers received a four-pack of CFLs for a total of 14,976 bulbs distributed. However, after removing non-valid or missing account numbers, only 3,175 unique KPC customers could be identified. The bulk of the bulbs were distributed between May and December; however, only 55 valid customers received bulbs in November. In 2010, 19,244 bulbs were distributed to 4,811 customers. Again, after removing non-valid or missing account numbers, only 4,189 unique customers could be identified (16,756 bulbs). Also, for 2010, the bulbs were distributed from March to December with very low numbers in August (56 customers) and December (108 customers). In total there were 34,220 bulbs distributed to 8,555 customers, of which 29,456 bulbs and 7,364 customers were validated. The percentage of customers and bulbs distributed that would be considered valid is 86%.

Once a valid set of customers was determined, the next step was to use the engineering estimate algorithm for CFLs (Appendix – Impact Methods and Assumptions) to determine an average per-participant energy, summer peak, and winter peak savings value. To calculate annualized energy savings, an average per-CFL savings must be determined based on the wattage of the bulb being removed (base wattage) and the wattage of the bulb being installed (replacement wattage). The difference in wattage is the per-hour usage, and this number is multiplied by the total number of bulbs installed, the average hours per day, and the average days per year of use to determine the per-participant, per-year usage. Once the average per-participant annualized savings were determined, values were discounted to account for the persistence of the measure. This new per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings should be as follows

2009 and 2010 Average Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
Per-Participant Savings	248	0.052	0.049

For 2009, KPC had goals of providing 3,500 customers with CFLs and saving KPC customers 644 MWh, 322 kW in winter peak demand and 14 kW in summer peak demand savings. The program was able to provide 3,744 participants with CFLs, and produce net annualized total program savings of 927 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized summer peak demand reductions were 196 kW and the net annualized winter peak demand reductions were 183 kW. KPC met 107% of the participant target, 144% of the energy target, 1,402% of the summer demand target, and 57% of the winter demand target.

For 2010, KPC had goals of providing 4,800 customers with CFLs and saving KPC customers 883 MWh, 442 kW winter peak demand and 19 kW in summer peak demand savings. The program was able to provide 4,811 participants with CFLs, and produce net annualized total program savings of 1,191 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized summer peak demand reductions were 252 kW and the net annualized winter peak demand reductions were 235 kW. KPC met 100% of the participant target, 135% of the energy target, 1,313% of the summer demand target, and 53% of the winter demand target.

For the first two years of the COCFL program, KPC was able to distribute 34,220 bulbs to 8,555 customers, producing net annualized program savings of 2,119 MWh of energy savings, 448 kW in summer demand and 417 kW in winter demand peak reductions. As a whole, KPC was able to meet 103% of the participant target, 139% of the energy target, 1,351% of the summer demand target, and 55% of the winter demand target. While the total energy savings and summer demand savings were higher than expected, the winter peak demand savings was lower. This was due to the participant survey results showing the bulbs being on more than expected during summer peak demand hours, and less than expected during winter peak demand hours.

Impact Results

The four key statistics used in an impact evaluation – number of participants, energy savings, summer peak demand reduction, winter peak demand reduction – are shown below. Included in the table are the program goals, the *ex-ante* savings, and the *ex-post* savings. *Ex-ante* savings are forecasted savings as reported by the program staff during the program's implementation. *Ex-post* savings are estimated savings as determined by the impact evaluation and reported in the evaluation report.

Impact Evaluation Results by Year

Category	Goal	Ex-ante	Ex-post	Percent of Goal
2009				
Participants	3,500	3,744	3,744	107%
Bulbs	14,000	14,976	14,976	107%
Energy (MWh)	644	689	927	144%
Summer Demand (kW)	14	15	196	1,402%
Winter Demand (kW)	322	344	183	57%
2010				
Participants	4,800	4,811	4,811	100%
Bulbs	19,200	19,244	19,244	100%
Energy (MWh)	883	885	1,191	135%
Summer Demand (kW)	19	19	252	1,313%
Winter Demand (kW)	442	443	235	53%
Total				
Participants	8,300	8,555	8,555	103%
Bulbs	33,200	34,220	34,220	103%
Energy (MWh)	1,527	1,574	2,119	139%
Summer Demand (kW)	33	34	448	1,351%
Winter Demand (kW)	764	787	417	55%

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects. Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). In addition to the tests, costs of conserved energy will be calculated from the utility perspective. Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included, unless new labor was utilized incrementally and specifically for DSM program implementation.

For 2009, the total program costs as filed were \$34,119, of which \$27,457 were incentives. However, these costs do not include the unrecoverable administrative costs from KPC staff and AEPSC staff. An estimated \$6,000 was included to account for unrecoverable costs, bringing the total to \$40,119 in actual costs related to the program. In 2010, the total filed program costs were \$57,134, of which \$39,745 were incentives. To account for unrecoverable admin costs and the costs from the 2010 evaluation of 2009 activity, another \$7,699 and \$8,806 were added respectively. However, these costs could not be corroborated by AEP's ledger. Cost data pulled from the Enterprise Warehouse showed that there was \$36,908 and \$26,226 spent in 2009 on recoverable total costs and incentives; and there was \$57,443 and \$23,749 respectively in 2010. Though costs were slightly different, neither value would significantly alter the benefit-cost analysis results.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analysis attempted to account for all costs related to program implementation and evaluation. Therefore an estimate of the value of KPC and AEP Service Corporation (AEPSC) staff time utilized to implement and evaluate the

program was added to the reported costs. The below table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	Total
2009	\$6,000	\$6,662	\$27,457	\$0	\$40,119
2010	\$7,699	\$6,884	\$39,745	\$8,806	\$63,134
2011	\$0	\$0	\$0	\$5,000	\$5,000

Goals were reported as total amounts respective to the winter peak only. However, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP generation pool that experiences summer peaking conditions, and winter to account for KPC's maximum system load that occurs in the winter.

The results for the benefit/cost tests show that the program was cost-effective from Participant, Program Administrator, and Total Resource perspectives, although each ratio underperformed compared to projections in the program filing. The likely reason for this underperformance is due to changes in the calculations of energy savings during the later years of the CFL bulb life. The Energy Independence and Security Act of 2007 (EISA) sets efficiency requirements for lighting that will cause the phasing out of most incandescent bulbs. This will increase the efficiency of the baseline comparison to the CFL, which justifies a discount in the future potential savings.

2009 and 2010 Summer Peak Cost Effectiveness Analysis

Cost Benefit Test	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	3.51	\$ 259,299	\$ 362,492	\$ 103,194
Total Resource Cost (TRC)	4.23	\$ 276,697	\$ 362,492	\$ 85,795
Ratepayer Impact Measure (RIM)	0.53	\$ (319,814)	\$ 362,492	\$ 682,306
Participant Cost (PCT)	N/A	\$ 734,082	\$ 734,082	\$ -

2009 and 2010 Winter Peak Cost Effectiveness Analysis

Cost Benefit Test	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	3.47	\$ 254,528	\$ 357,722	\$ 103,194
Total Resource Cost (TRC)	4.17	\$ 271,926	\$ 357,722	\$ 85,795
Ratepayer Impact Measure (RIM)	0.52	\$ (324,585)	\$ 357,722	\$ 682,306
Participant Cost (PCT)	N/A	\$ 734,082	\$ 734,082	\$ -

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, there will be any changes to the cost effectiveness of the program in future years. Any number of a multitude of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the COCFL program, results from the current evaluation were used as the starting point for the cost-benefit analysis. Future savings values were discounted due to increasing the free ridership percent as a result of effects from the Energy Independence and Security Act of 2007. While the reduction in savings could be attributed to an increase in efficiency in the baseline technology, thus reducing the per-bulb savings, it is more likely that future participants will simply not have an opportunity to purchase incandescent bulbs, thus an increase in free ridership. Currently, CFLs are ubiquitous at most big-box retailers and home stores reducing the availability of incandescent bulbs. However, the lower annualized energy savings due to the lack of incandescent bulbs is offset by an increase in the cost of avoided energy in future years. The results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective.

2012-2014 Winter Peak Cost Effectiveness Analysis

Benefit Cost Test	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	2.73	\$ 320,612	\$ 505,480	\$ 184,868
Total Resource Cost (TRC)	3.91	\$ 376,066	\$ 505,480	\$ 129,414
Ratepayer Impact Measure (RIM)	0.62	\$ (306,350)	\$ 505,480	\$ 811,830
Participant Cost (PCT)	N/A	\$ 1,116,488	\$ 1,116,488	\$ -

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the COCFL program.

- 1) Results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective. Therefore, it is our opinion that the COCFL program should continue through 2014, with periodic evaluations to ensure the program is still cost effective.
- 2) Greater scrutiny should be applied to data collection and tracking. Every customer list should have at a minimum, the customer's utility bill account number in the same format as it is stored in the CIS, the install date of the measure (handout date), and number and wattage of the CFLs.
- 3) Marketing related data should be captured and tracked to provide marketing analysis. This should include information relating each campaign, the method of transmittal, and costs.
- 4) Future costs should be captured in a more organized and delineated manner. Each program should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.
- 5) On-going program management should be handled by KPC staff, including tracking of customer participation and estimated *ex-ante* savings.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.

- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual, Ohio TRM – Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.
- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template. *Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline*. MS Excel Workbook. 20 May 2010.
- VII. AEP Load Research Analysis Evaluation Report for the Community Outreach Compact Fluorescent Lighting Program in Kentucky Power Company Program Period: January 2009 – December 2009. August 2010.
- VIII. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- IX. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- X. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XI. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix - Impact Methods and Assumptions

Impact Methods

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life, with savings discounted after the EISA Act of 2007 which reduces the availability for savings in future years due to lack of available alternatives. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long-term savings from the specific installations.

Technology Description

A low wattage ENERGY STAR qualified compact fluorescent screw-in bulb (CFL) is purchased through a retail outlet in place of an incandescent screw-in bulb. The incremental cost of the CFL compared to the incandescent light bulb is offset via either rebate coupons or via upstream markdowns. Assumptions are based on a time of sale purchase, not as a retrofit or direct install installation. This characterization assumes that the CFL is installed in a residential location. Where the implementation strategy does not allow for the installation location to be known and absent verifiable evaluation data to support an appropriate residential versus commercial split, it is recommended to use this residential characterization for all purchases to be appropriately conservative in savings assumptions.

Algorithms

$$kWh = \frac{(W_{base} - W_{replace})}{1000} \times (H \times 365) \times (1 + IF)$$

$$kW = \frac{(W_{base} - W_{replace})}{1000} \times CF \times (1 + IF)$$

Terms

Term	Description
kWh	Energy Savings.
kW	Demand Savings.

W _{base}	Wattage of bulb being removed.
W _{replace}	Wattage of bulb being installed.
H	Average Daily hours-of-use.
IF	Interactive Factor.
CF	Coincidence Factor.

Validation Rules

Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis (or the end of the measure's expected life).
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Free Ridership	27%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%
Installation Ratio	61.1%
Measure's expected life in years	6
Average Daily Hours of Use	4.5
Days per year of Use	351
Energy Waste Heat Factor	1.07
Demand Waste Heat Factor	1.21
Summer Coincidence Factor	0.29
Winter Coincidence Factor	0.27

EISA Discounts

Percentage Adjustments for Energy Star Lighting with Base Wattage					
Watts Low	Watts High	<= 2011	2012	2013	>= 2014
0	15	100%	100%	100%	63%
16	20	100%	100%	62%	62%
21	∞	100%	63%	63%	63%

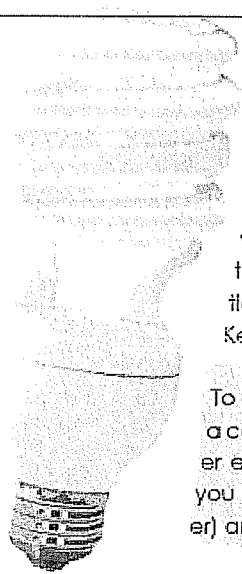
Wattage Adjustments for Energy Star Lighting without Base Wattage					
Watts Low	Watts High	<= 2011	2012	2013	>= 2014
0	15	3.25	3.25	3.25	2.05
16	20	3.25	3.25	2.00	2.00
21	∞	3.25	2.06	2.06	2.06

Appendix – Exhibits

Exhibit 1 – Sample Newspaper Advertisement

FREE CFLs

Kentucky Power will be distributing energy efficient, compact fluorescent light bulbs (CFLs) to customers **Wed., June 17, at our Hazard Service Building** (address below). The **FREE** CFLs will be available on a first-come, first-served basis while supplies last.



CFLs are a great choice to light your home. They can last up to 10 times longer than incandescent bulbs and typically use 1/4 - 1/3 less electricity. They also produce 80 percent less heat, yet provide more light. All this means they can save you money, particularly when they are **FREE** to Kentucky Power customers.

To get your **FREE CFL***, simply bring a copy of your AEP/Kentucky Power electricity bill (so we can verify you are a Kentucky Power customer) and receive your bulb.

This promotion is for AEP/Kentucky Power customers only.



CFL GIVEAWAY

9 a.m. - 3 p.m.*
Wed., June 17, 2009
Kentucky Power Service Bldg.
1400 East Main Street
Hazard, KY

* While supplies last. Kentucky Power reserves the right to limit the number of CFLs provided to each customer.

Exhibit 2 – Some Facts About CFL

Some facts about **CFL** Compact Fluorescent Lighting

Compact fluorescent light bulbs (CFLs) are a great way to save energy and money in your home. Designed to directly replace incandescent bulbs, they offer the best features of fluorescent lighting – longer life, lower operating costs and less heat gain – with the ease and convenience of traditional lighting. Consider the following:

☐ CFLs can last up to 10 times longer than incandescent bulbs. This means you won't have to change light bulbs nearly as often. While you may pay more up front for a CFL bulb (and they get cheaper every day), you will only have to replace it every 5-13 years.

☐ CFLs typically use 1/4 to 1/3 less energy than traditional light bulbs. For example, a 28-watt compact fluorescent typically provides as much light as a 100-watt incandescent bulb. This means you will save money on your monthly electric bill.

☐ CFLs produce about 80 percent less heat, yet provide more light. Less heat makes them easier to work around and helps reduce summer air-conditioning costs.

☐ CFLs are environmentally friendly. According to Energy Star (a joint program of the United States Environmental Protection Agency and the Department of Energy) every compact fluorescent light can prevent more than 450 pounds of emissions from a power plant over its life.

☐ CFLs can save you money. While the initial cost of a compact fluorescent light bulb will be higher than a comparable incandescent bulb, savings will be realized due to the lower wattage of the bulb and the longer life. Want to know how much you can save? Visit our web site at kentuckypower.com and utilize our Online Energy Calculator function. There you will discover how much CFLs can save you on your electricity bill. You will also learn about other steps you can take to conserve electricity and lower your energy costs.

LIGHT OUTPUT EQUIVALENCY		
WATTAGE	INCANDESCENT BULB	COMPACT FLUORESCENT BULB
40	450	9-13
60	800	13-15
75	1,100	18-25
100	1,600	23-30
150	2,600	30-52

COMPARE & SAVE

28-watt CFL bulb	Equivalent to	100-watt incandescent bulb
Purchase price = \$3.22		Purchase price = \$.99
Light output = 1650 lumens		Light output = 1650 lumens
Expected Life = 20000 hours		Expected Life = 750 hours
Life Cycle Cost = \$7.76		Life Cycle Cost = 367.50

*For comparison purposes, based on a 1000 hr. life cycle.
 Energy costs based on \$.07 per kWh.



www.kentuckypower.com

(800) 572-1113

Exhibit 3 – Fact Sheet: Mercury in CFLs

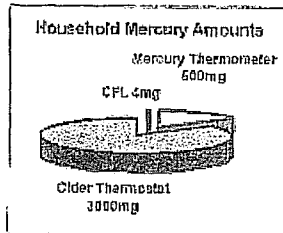
FACT SHEET: Mercury in Compact Fluorescent Lamps (CFLs)

The US Environmental Protection Agency has prepared this fact sheet to respond to questions and concerns about mercury in energy-efficient lighting that uses compact fluorescent technology.

What are the Health Risks of Mercury and How do CFLs Fit In?

Mercury is an essential ingredient for most energy-efficient lamps. The amount of mercury in a CFL's glass tubing is small, about 4mg. However, every product containing mercury should be handled with care. Exposure to mercury, a toxic metal, can affect our brain, spinal cord, kidneys and liver, causing symptoms such as trembling hands, memory loss, and difficulty moving.

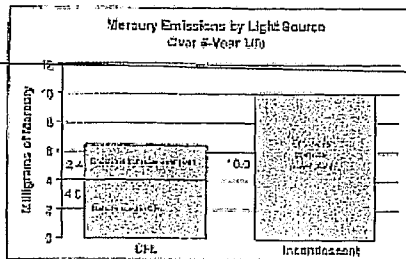
As energy-efficient lighting becomes more popular, it is important that we dispose of the products safely and responsibly. Mercury is released into our environment when products with mercury are broken, disposed of improperly, or incinerated. If you break a CFL, clear it up safely. And always dispose of it properly to keep CFLs working for the environment.



Mercury is an ingredient in several household products. Recycling programs exist for mercury in older non-digital thermostats and mercury thermometers, but residential CFL recycling programs are just now appearing.

CFLs Responsible for Less Mercury than Incandescent Light Bulbs

Ironically, CFLs present an opportunity to prevent mercury from entering our air, where it most affects our health. The highest source of mercury in our air comes from burning fossil fuels such as coal, the most common fuel used in the U.S. to produce electricity. A CFL uses 75% less energy than an incandescent light bulb and lasts at least 8 times longer. A power plant will emit 10 mg of mercury to produce the electricity to run an incandescent bulb compared to only 2.4 mg of mercury to run a CFL for the same time.



Source: US EPA, June 2000

Always Dispose of Your CFL Properly

While CFLs for your home are not legally considered hazardous waste according to federal solid waste rules, it is still best for the environment to dispose of your CFL properly upon burn-out. Only large commercial users of tubular fluorescent lamps are required to recycle. If recycling is not an option in your area (see below on how to find out), place the CFL in a sealed plastic bag and dispose the same way you would batteries, car-based paint and motor oil at your local Household Hazardous Waste (HHW) Collection Site. If your local HHW Collection Site cannot accept CFLs (check Earth911.org to find out) seal the CFL in a plastic bag and place with your regular trash.

Safe cleanup precautions: If a CFL breaks in your home, open nearby windows to disperse any vapor that may escape, carefully sweep up the fragments (do not use your hands) and wipe the area with a disposable paper towel to remove all glass fragments. Do not use a vacuum. Place all fragments in a sealed plastic bag and follow disposal instructions above.

Resources for Recycling or Proper Disposal of CFLs

NOTE: Residential recycling programs are not yet available in most regions.

1. Earth911.org (or call 1-800-CLEAN-UP for an automated hotline); Online, enter your zip code, press 'GO,' click 'Household Hazardous Waste,' then 'fluorescent light bulb disposal.' The site will alert you nearest residential mercury recycling facility or mail disposal method. If you find no specific information on CFL disposal, go back and click on the link for 'Mercury-Containing Items.'

2. Call your local government if the Web site and Hotline number above does not have your local (any other) link on the Internet or in the phone book for your local or municipal government; entity responsible for waste collection or household hazardous waste.

Appendix – Survey Results

Kentucky Power
CFL Distribution Program Study
Community Outreach CFL Segment
Report



Thoroughbred Research Group
1941 Bishop Lane Suite 1017
Louisville, KY 40218
www.torinc.net

Research Methodology

Project Background

Kentucky Power implemented a program to distribute packages of compact fluorescent lights (CFLs) to residents of their service area by making complimentary four-packs of CFLs available at various community events. In an effort to estimate the effectiveness of the program and to better understand consumer behavior related to the distribution, Kentucky Power and AEP contracted with Thoroughbred Research Group to conduct a survey among residential customers who received one or more of the four-pack CFLs for use in their homes.

Specific objectives of the research included:

- Document the extent to which the 4-pack CFLs are currently in use in homes
- Determine the types of bulbs the CFLs replaced and the wattage of bulbs replaced (if replacing incandescent bulbs)
- Measure the amount of time the CFLs are in use
- Identify where in the home the CFLs have been installed
- Determine general levels of satisfaction with the CFL distribution program

Research Methodology

This study consisted of a telephone survey of 255 Kentucky Power customers who had received one or more of the CFL packs at a community event. Kentucky Power supplied Thoroughbred Research with a list of participating customer names and telephone numbers.

Interviews were gathered between May 17 and May 22, 2010. The questionnaire for this study was developed by the staff of AEP and Kentucky Power. Surveys averaged approximately seven minutes to complete.

Representing a population of 2,589 unique customer households, this sample of 255 interviews produces results accurate to within no more than plus or minus 4.9 percentage points at 90% confidence.

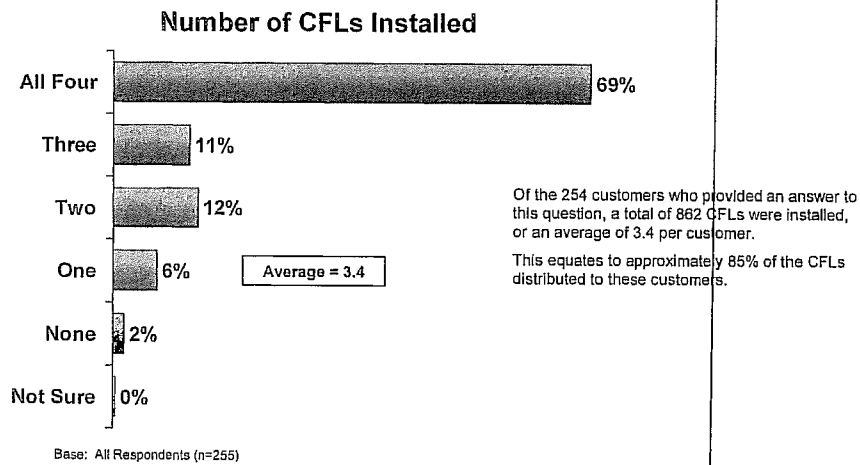


Key Findings

1. Among the 255 respondents in this study, we asked each respondent to detail the experience with the most recent 4-pack of CFLs they received from Kentucky Power (in the event they received more than one package). With descriptions on a total of 1,020 CFLs (255 x 4), we found that:
 - 793 of the CFLs are currently still in use in the home (78%)
 - 69 were installed but are no longer in use (7%)
 - 158 were never installed (15%)
2. More than three out of four participants reported having used the CFLs to replace one or more incandescent bulbs. About 61% of the total CFLs distributed replaced an incandescent bulb, with an average wattage of 70 watts.
3. On average, the CFLs distributed through this program that are still in use are operating 4.5 hours per day.
4. Two-thirds of the CFLs still in use are placed in three areas of the home – the living room (27%), the kitchen (22) and a bedroom (18%).
5. About half the program participants (47%) said they had already installed CFLs in their home prior to receiving this pack from Kentucky Power. These customers reported having had an average of 6.2 prior CFLs per household.
6. About one in four (27%) said they did not have any CFLs prior to receiving them from Kentucky Power, but had planned to do so; and 22% said they did not have any prior, but had since purchased additional CFLs.
7. Satisfaction is very high among program participants in terms of both the CFLs they received (97%) as well as the promotion as a whole (97%).

Number of CFLs Installed

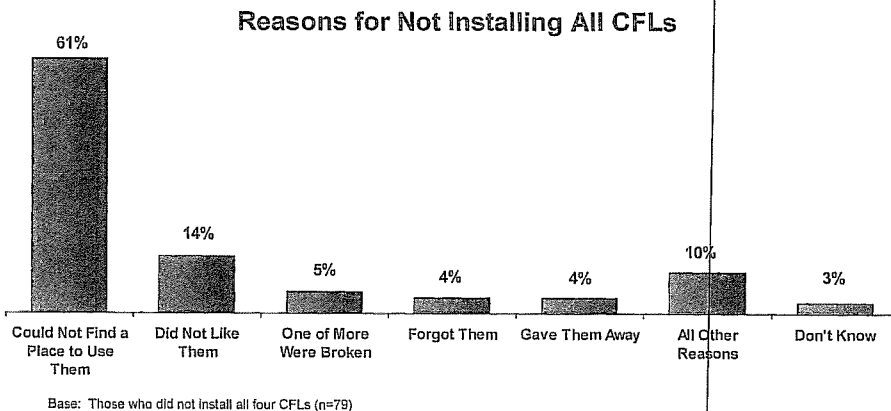
Nearly seven out of ten customers reported having installed all of the CFLs they received from Kentucky Power. Only 2% reported they had not yet installed any of the CFLs.



Reasons for Not Installing All CFLs

The 79 respondents (about 31% of the total sample) who did not install all four of the CFLs they received were asked why they had not used all four bulbs.

The dominant reason was not being able to find a place in the home to use all of the bulbs (mentioned by 61%). Another 14% of this group said they did not like the CFLs, while 5% reported that one or more of the CFLs they received were broken.

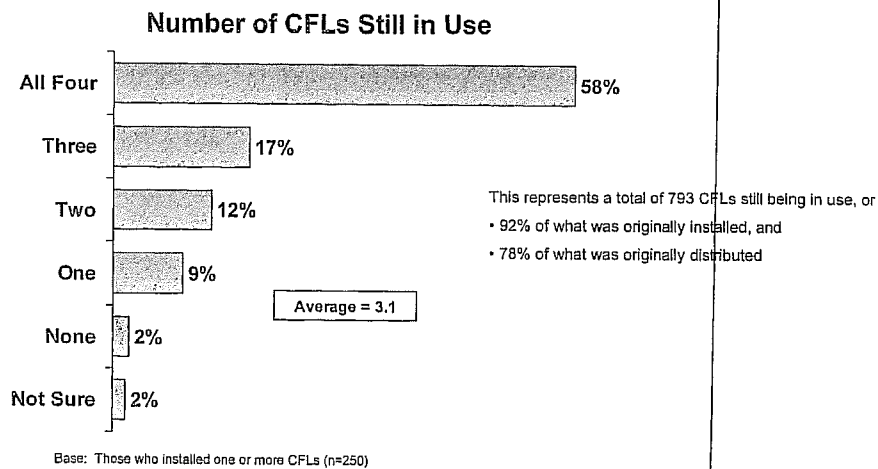


Base: Those who did not install all four CFLs (n=79)



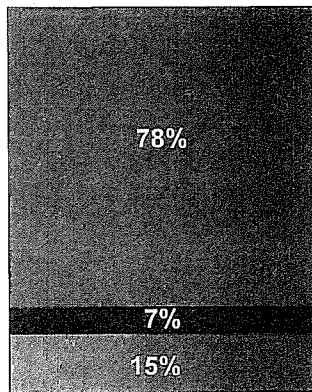
Number of CFLs Still in Use

Among those who originally installed at least one of the CFLs they received, well over half (58%) say all four CFLs are still in use in their homes. Only 2% reported none of the bulbs they had originally installed are still in use.



Net Distribution, Installation and Use

1,020 CFL Bulbs
Distributed



The results of this survey indicate that 78% of the CFLs Kentucky Power distributed through community events are currently being used in customers' homes.

Still in Use = 793

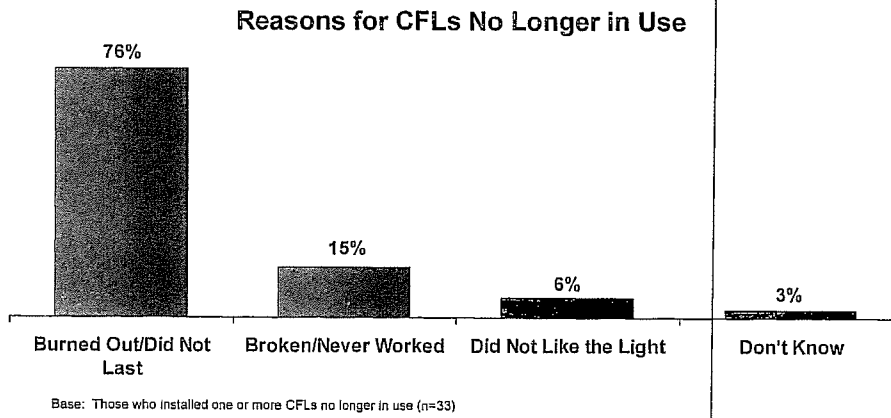
Installed, No Longer in Use/Not Sure if In Use = 69

Never Installed/Not Sure if Installed = 158

Base: All respondents (n=255)

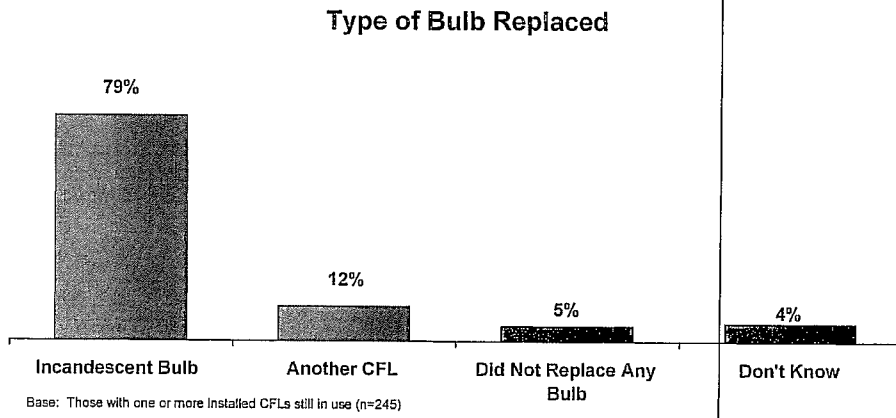
Reasons for CFLs No Longer in Use

The 33 respondents who reported that one or more of the CFLs they originally installed are no longer in use in their home, the primary reason is that the bulbs had burned out and no longer work (mentioned by 76% of this group). Another 15% said the bulbs were broken or never worked at all. Only 6% say they did not like the light the CFLs produced.



Type of Bulb Replaced

More than three out of four reported they used the CFLs they received from Kentucky Power to replace an incandescent light bulb in their home. Twelve percent replaced another CFL in the home, and 5% said the bulbs they received did not replace any previous bulbs in the home.



THOROLIGHBRED
RESEARCH GROUP

Wattage of Incandescent Bulbs Replaced

Those who used the CFLs they received from Kentucky Power to replace one or more Incandescent bulbs in their homes (189 of the 255 survey participants) were asked to detail the wattage of each bulb replaced. In total, these respondents gave responses for 623 light bulbs.

Excluding "don't know" responses, 54% of the CFLs replaced a 60-watt incandescent bulb, 21% replaced a 100-watt bulb and 19% replaced a 75-watt bulb.

Wattage of Incandescent Bulbs Replaced

	Number	Percent of All Responses	Percent of Known Wattage
15 Watt	1	< 0.5%	< 0.5%
40 Watt	28	4%	5%
50 Watt	2	< 0.5%	< 0.5%
60 Watt	327	52%	54%
70 Watt	2	< 0.5%	< 0.5%
75 Watt	118	19%	19%
100 Watt	128	21%	21%
110 Watt	1	< 0.5%	< 0.5%
3-way Bulb (60-75-100)	2	< 0.5%	< 0.5%
Don't Know	14	2%	
Total	623	100%	100%

In total, these 623 CFLs replaced a 70-watt incandescent bulb on average.

The 623 bulbs detailed in the table at the left represent 61% of the total CFLs distributed, and 79% of the total CFLs still in use.

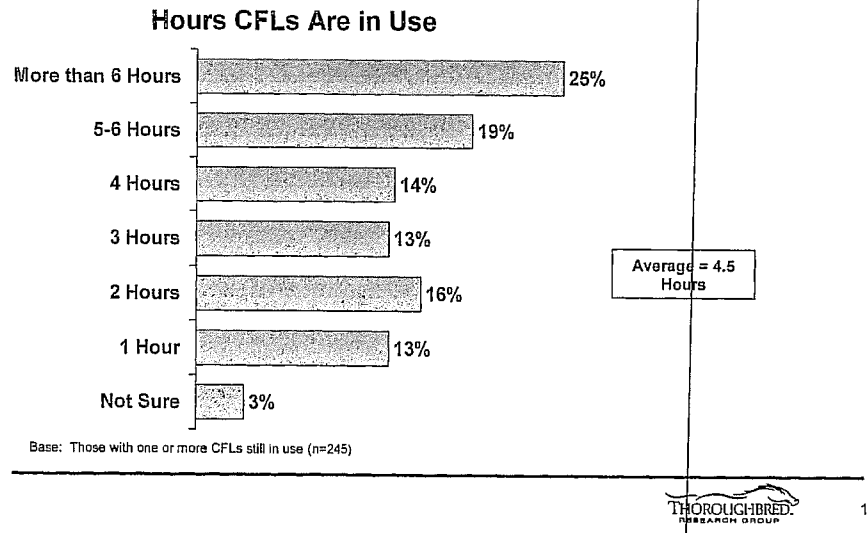
Base: Those who replaced one or more incandescent bulbs with a CFL (n=189)



Hours in Use

Respondents with one or more of the CFLs still in use in their home were also asked to how long each bulb is typically used each day in the home.

When aggregating the responses for all 793 CFLs described in this survey, the average daily use was 4.5 hours per CFL still in use.

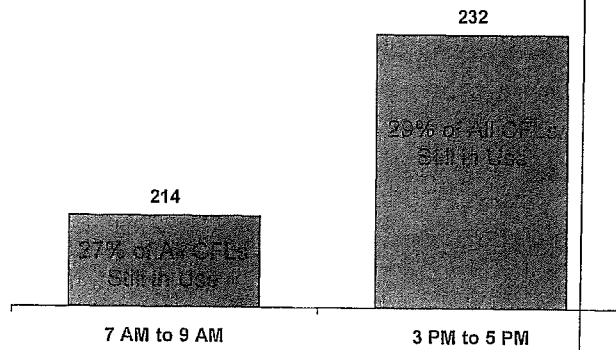


Peak Hour Use

Of the 793 CFLs described in this study, 214 bulbs (or 27%) were reported to be in use during the morning peak period of 7:00 AM through 9:00 PM

Respondents reported 232 bulbs (or 29%) in use for the afternoon peak time period of 3:00 PM through 5:00 PM.

Bulbs in Use During Peak Times



Base: Those with one or more CFLs still in use (n=245)

Placement of CFLs in Home

Of the 793 CFLs still in use, about two-thirds are used in three areas of the home – the living room (27%), the kitchen (22%) and a bedroom (18%).

Where in Home CFLs are Used

	Number	Percent of All Responses	Percent of Known Placements
Living Room	212	27%	27%
Kitchen	175	22%	22%
Bedroom	139	18%	18%
Bathroom	90	11%	11%
Family/TV Room	51	6%	7%
Outside	31	4%	4%
Entry Hall	25	3%	3%
Dining Room	21	3%	3%
Laundry Room	12	2%	2%
Home Office	11	1%	1%
Garage/Basement	10	1%	1%
Utility Room	3	<0.5%	<0.5%
Other	4	1%	1%
Don' Know/No Answer	9	1%	
Total	793	100%	100%

67%

Base: Those with one or more CFLs still in use (n=245)



Experience with Other CFLs in the Home

Nearly half (47%) reported having had CFLs installed in their home prior to receiving the four-pack from Kentucky Power. Of this group, the average number of previously installed CFLs in the home was 6.2 bulbs.

Other CFLs in the Home

Other CFLs in Home Prior to Receiving 4-Pack from Kentucky Power	47%
<i>Average Number of Previously Installed CFLs</i>	6.2
No CFLs Prior to Receiving 4-Pack from Kentucky Power	53%
• But were planning on getting CFLs	27%
• Have purchased additional CFLS since	22%

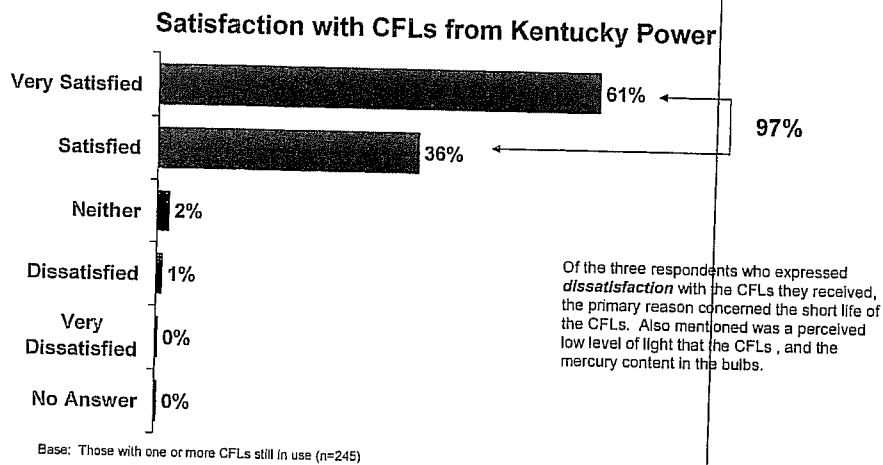
Base: Those with one or more CFLs still in use (n=245)

The remaining 53% reported they did not have any CFLs in their home prior to receiving some from Kentucky Power.

A total of 27% said they were planning on buying some, and 22% said they have since bought additional CFLs for their home.

Satisfaction with CFLs Received

Satisfaction with the CFL distribution program among participants is very high. Ninety-seven percent expressed being satisfied with the CFLs they received from Kentucky Power, with 61% indicating they are "very satisfied".



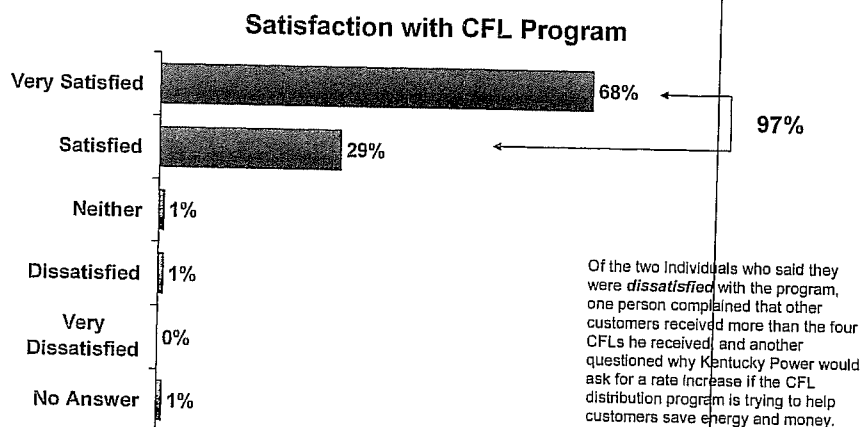
Verbatim Comments:

"Why were you dissatisfied with the CLFs you received from Kentucky Power?"

- "The longevity. The price of them. The energy efficiency. That's about it."
- "The short life span. And the low illumination. That's about it."
- "They used to be made in Kentucky and now they're made in China. They didn't last that long either. I heard they are mercury-based and you have to be careful when you dispose of them. The politicians are asking for a 35% raise and its making the power company filthy rich. It's about making them rich. That's all."

Overall Satisfaction with Program

Likewise, overall satisfaction with Kentucky Power's CFL program is very high. Ninety-seven percent expressed satisfaction with the program, with over two-thirds (68%) saying they are "very satisfied".



Base: Those with one or more CFLs still in use (n=245)

Verbatim Comments:

"Why were you dissatisfied with this program from Kentucky Power?"

- "Because some of the people got eight, ten, twelve bulbs and I only got four and I don't understand the reasoning why."
- "The political reasons. If they passed out all of these light bulbs that are supposed to be energy efficient and if it's saving energy so much, why are they asking for a 35% raise in Kentucky? No, that's it."

Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
argraves@aep.com

Joseph Chambers
Load Research Analyst
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kjvass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrniecek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsbereson@aep.com


The logo for AEP (American Electric Power) is displayed in white, bold, sans-serif capital letters. It is contained within a dark, rectangular background that is part of a larger, textured banner.

Evaluation Report

Kentucky Power Company Energy Education for Students

Evaluation Report for 2009-2010

July 2011

A decorative graphic at the bottom of the page, consisting of a dark, textured, horizontal bar that tapers from left to right.

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Description.....	5
Process and Market Evaluation	7
Summary	7
Promotional Effectiveness.....	7
Delivery Mechanism	7
Product Awareness.....	8
Free Riders and Spillover	8
Market Potential	9
Customer Satisfaction	9
Impact Evaluation	10
Impact Results.....	12
Cost Effectiveness Evaluation.....	13
Prospective Analysis	15
Recommendations.....	16
References.....	17
<hr/>	
Appendix - Impact Methods and Assumptions	18
Impact Methods.....	18
Technology Description	18
Algorithms	18
Terms	19
Validation Rules	19
Assumptions.....	19
EISA Discounts	20
Appendix - Exhibits.....	21
Exhibit 1 - Cover Sheet of Workshop Manual	21
Exhibit 2 - Teacher's Guide (page 1)	22
Exhibit 3 - Teacher's Guide (page 2)	23
Exhibit 4 - Data Collection Form	24
Appendix - Survey	25
Appendix - Teacher Questionnaire	42
Questionnaire Sample.....	42
Questionnaire Results.....	43
Appendix - EE/DR Analytics Team Members	44
Load Research.....	44
EE and Consumer Programs.....	44
Marketing.....	44

Executive Summary

The objective of the Kentucky Power Company's (KPC) Energy Education for Students Program (EEFS) is to promote the conservation and efficient use of electricity by encouraging the use of energy efficient ENERGY STAR® CFLs in place of incandescent light bulbs. Qualified customers in targeted schools receive a package of four ENERGY STAR® CFLs along with energy education materials. This report provides the evaluation results for the 2009 and 2010 program years, and a prospective analysis for the years 2012-2014.

The evaluation consisted of an impact analysis, market effects and process evaluation, and a cost-benefit analysis for the program participants in years 2009 and 2010. The prospective analysis used the evaluation results to forecast the effectiveness of the program in 2012-2014 with respect to KPC's winter peak. For 2009 and 2010, the EEFS program distributed 10,708 CFLs to 2,677 KPC customers, providing 594 MWh of net annualized energy savings, 144 kW of summer peak demand reductions, and 72 kW of winter peak demand reductions. The process evaluation concluded that the promotion and delivery processes were effective and that there was a sizable market for CFLs.

Based on the results of the evaluation, the EEFS program was determined to be cost-effective under the two of the cost-benefit tests used in the California Standard Practice Manual and KPC should continue to utilize the program through the remainder of the current program life (2011). The prospective analysis of the program for 2012-2014 predicts the program will be cost-effective; however, it is recommended that KPC evaluate potential replacements for the EEFS program in their portfolio of energy efficiency programs.

2009-2010 Cost-Benefit Evaluation Results

Cost Benefit Test	Summer Peak Ratio	Winter Peak Ratio
Program Administrator Cost (PACT)	2.00	1.79
Total Resource Cost (TRC)	2.28	2.04
Ratepayer Impact Measure (RIM)	0.50	0.44
Participant Cost (PCT)	N/A	N/A

2012-2014 Cost-Benefit Prospective Results

Cost Benefit Test	Winter Peak Ratio
Program Administrator Cost (PACT)	1.28
Total Resource Cost (TRC)	1.65
Ratepayer Impact Measure (RIM)	0.47
Participant Cost (PCT)	N/A

Program Description

Kentucky Power Company manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The Kentucky National Energy Education Development (NEED) Project was developed to implement an energy education program at participating middle schools within the service territory with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and was approved by the Public Service Commission (PSC) on February 24, 2009 (Case No. 2008-00349) to help meet Kentucky Power's goals.

The major goals of the program are to:

- 1) Provide education to students about energy, electricity, the environment and economics
- 2) Encourage the use of energy efficient lighting in the homes of students
- 3) Reduce customer usage of electric energy
- 4) Increase customer satisfaction and services
- 5) Reduce Kentucky Power's long-range peak demand.

The Energy Education For Students Program was designed as both an energy education program and as a program to promote energy efficient lighting in residential homes. KPC worked in partnership with the Kentucky NEED Project to provide energy education materials to the participating middle schools and a package of four (4) ENERGY STAR® qualified CFLs to each seventh grade student at the participating schools. This allowed students to better understand the purpose and benefits of implementing energy efficient CFLs in their home and to study the capabilities and direct savings of CFLs.

The lower wattage of CFLs versus the higher wattage of incandescent bulbs to attain the same level of lumens reduces energy consumption, which in-turn lowers the customer's monthly electric bill, and provides both energy and demand savings to KPC. Additionally, the life of the high-efficiency CFLs exceed that of the incandescent lamps by about a factor of ten, thus reducing equipment costs and adding another benefit of using this energy conservation measure in a customer's home. Although, today's higher purchase price could still be considered somewhat of a barrier which prevents customers from purchasing a CFL versus an incandescent bulb, this barrier is less overwhelming than in previous years, and can be overcome with additional education regarding the financial benefits of CFLs. Historically, CFLs were limited to specific home lighting applications, but improving CFL technology has created more applications for the use of CFLs.

Despite the increased availability and applicability of CFLs, there are still significant numbers of customers in the KPC service territory that are not aware of the many benefits that CFLs provide. KPC

believes that the education of improved technology of energy efficient products, such as CFLs, can have a significant benefit if targeted to students at schools within its service territory. Energy, economics, and environmental issues are currently taught in schools today and energy conservation affects each of these three issues. This Program also provides another low-cost avenue for KPC to reach its customers via students of the participating schools.

KPC staff coordinated the enrollment of the participating middle schools, the scheduling of educational workshops in conjunction with the Kentucky NEED Project, and the delivery of educational materials and CFLs. The educational workshops were conducted to ensure that all participating middle schools received the same information concerning the Energy Education For Students Program. Two workshops were scheduled in each area. Invitations were mailed to the teachers of each seventh grade class of each school district. The Program was introduced and described and each teacher received a workshop manual containing a NEED Teacher Guide with educational materials on energy, electricity, the environment and economics. For those teachers unable to attend a scheduled workshop, KPC staff scheduled a meeting with the teachers at the school to introduce the Program and provide the workshop manual with the educational materials. The teachers used the workshop manual as a teaching guide to introduce the Program and provided the educational materials to their seventh grade class. Each student was given a form to be filled out by their parents and returned to the teacher to verify that the parent is a KPC customer. Upon receiving the completed forms from the students, KPC personnel visited the school, collected the forms, and provided the four-packs of ENERGY STAR® qualified CFLs to the teachers, to be given to the participating students. Providing the CFLs to the students for installation in their homes allowed a hands-on application to study the capabilities and benefits of CFLs.

Process and Market Evaluation

Summary

KPC utilized middle schools to administer the Program to deliver education materials and a four-pack of ENERGY STAR® qualified CFLs to each qualified customer. The EEFS promotions were reasonably effective. All school superintendents gave support to the program, but KPC staff indicated that receiving principal support was more problematic. Once contacted, teachers were very receptive to the program. A teacher follow-up survey, conducted in May 2010, indicated that the NEED workshops and the education materials provided were valuable tools for promoting and teaching energy conservation measures to both them and their students. The delivery mechanism was effective. Partnering with NEED facilitated effective program delivery at a reasonable cost. Careful selection of the schools involved ensured that program benefits went mostly to KPC customers. The provision of energy efficiency related educational material along with the energy saving CFLs potentially provided the opportunity for additional energy savings in the student's homes. Free ridership was not found to be excessive. Goals appeared to be appropriately set. KPC reached the customer participation goal in a cost-effective manner that provided excellent customer satisfaction ratings.

Promotional Effectiveness

During the 2009 school year nineteen schools, exclusively within the KPC service territory, participated in the EEFS program. KPC contacted the superintendent of each selected school district, described the Program, obtained their approval to implement the Program within their school district, and then contacted the individual school principals before making contact with the teachers. KPC staff mailed invitations to the selected teachers. During the 2010 school year twenty schools participated, five of which also participated in the 2009 program. All contacted superintendents supported the program. KPC staff indicated that the teachers were the main obstacle to promotion, specifically the teacher's schedule, demands, and pre-conceived notions about the efficacy of energy education. During 2010 KPC further enhanced program promotion as they developed a presentation board that could be used by clubs to increase energy efficiency awareness. Quarterly emails were also sent to teachers to promote the effectiveness of the program.

Delivery Mechanism

KPC staff coordinated the enrollment of the participating schools and partnered with the Kentucky National Energy Education Development (NEED) Project to implement the Program with seventh grade students at participating schools within the KPC service territory. NEED conducted teacher workshops on a scheduled basis to ensure that all participating schools were provided the same information regarding the Program. Two workshops were scheduled in each area. Invitations were mailed to the

teachers of each seventh grade class in each school. The Program was introduced and described and each teacher received a workshop manual (cover sheet shown in Appendix A, Exhibit 1) containing a NEED Teacher Guide (Appendix A, Exhibit 2 and 3) with educational materials on energy, electricity, the environment and economics. For those teachers unable to attend a scheduled workshop, KPC staff scheduled a meeting with the teachers at the school to introduce the Program and provide the workshop manual with the educational materials. The teachers used the workshop manual as a teaching guide to introduce the Program and provided the educational materials to their seventh grade class. Each student was given a form (Appendix A, Exhibit 3) to be filled out by their parents and returned to the teacher to verify that the parent is a KPC customer. KPC personnel visited the school, collected the forms, and provided the four-packs of ENERGY STAR® qualified CFLs to the teachers to be given to the participating students. The incentive to the participant's households was that each student received education materials, a four-pack of ENERGY STAR® qualified CFLs, and potential energy savings resulting in savings with their electric bill. The delivery mechanism was effective in that it utilized existing institutions to provide a low-cost means of distributing CFLs, most CFLs went to KPC customers and, by reaching the youth, the program should enhance energy efficiency awareness in a group of people who can take steps to implement energy efficiency for many years.

Teacher Satisfaction was reasonably high. 60% of the teachers responded to the teacher's follow-up survey and all of those that responded indicated the NEED workshop and educational materials were valuable tools for promoting and teaching energy conservation measures to both them and their students. Additionally, the teachers indicated that their seventh grade students were receptive in understanding the benefits of installing energy conservation measures in their home, such as CFLs. Federal government is also working to enact guidelines for teaching energy education. Once adopted, more schools will participate to meet the guidelines.

KPC staff indicated that NEED provided an effective program delivery, but possibly they could take on more of the promotion and administrative work, although that would possibly increase the program cost.

Product Awareness

The Participants' pre-program awareness of energy efficient CFLs was mediocre, with 41% of the participants surveyed stating they had used CFLs in their home prior to the Program, and 59% of the participants surveyed having not previously used CFLs in their home.

Free Riders and Spillover

A free rider is a participant who utilized the provided CFLs, but would have purchased and installed equivalent CFLs had they not participated in the Program. Spillover refers to additional CFLs purchased

by participants as a result of the program. From the survey responses, 27% of participants indicated they would have purchased and installed equivalent CFLs without the program and thus were classified as likely free riders in this program. The survey results also indicated that 24% of participants purchased additional CFLs since participating in the Program, providing a potential spillover effect and potentially providing additional energy savings. The authors of this report had some concerns with the survey wording, therefore, to stay conservative, the 27% free rider response was used for the impact analysis and the spillover effects were treated as zero.

Market Potential

Based on the responses to the 2010 Residential Appliance Saturation Survey, it was determined that 13% to 25% of rooms in KPC customer's homes utilize some CFLs as a source of lighting. The top three locations in the home where CFLs were the main source of lighting were the kitchen, living room and master bedroom, respectively. For all the locations in the home it can be said that three to six times more customers are still using incandescent bulbs for their main source of lighting. Therefore, there continues to be a significant market opportunity to promote energy efficient CFLs in the KPC service territory.

Customer Satisfaction

The participant follow-up survey showed that overall satisfaction with the Program was very high, with 95% of the survey respondents indicating they were very satisfied (59%) or satisfied (36%) with receiving the energy efficient CFLs. Approximately 4% of the respondents surveyed expressed dissatisfaction with the CFLs because the CFLs had either a short life, took too long to light up, or provided unsatisfactory light output. In addition, 92% of the participants that remembered receiving the energy educational materials were either very satisfied (52%) or satisfied (40%) with the educational materials. The survey results also indicated that 16% of the respondents removed their CFLs from their home mainly due to lamp failure, while another 16% of the respondents never installed their CFLs because they did not believe they had an appropriate location to place them in their home.

Impact Evaluation

The evaluation began with an engineering estimate analysis of the implementation data collected by KPC. The engineering estimates were used to develop gross measure savings without post-consumption data or a billing analysis. A billing analysis was not performed because the magnitude of impacts in a CFL program falls within the normal bill variability. Implementation data was utilized to determine frequencies of installed measures as well as many values needed to calculate engineering estimates of measure savings. For Net-To-Gross calculations, survey results provided a basis for net savings estimates.

In order to capture accurate per-participant savings numbers, the list of applicable customers must first be validated. For 2009, 1,130 customers received a four-pack of CFLs for a total of 4,520 bulbs distributed. However, after removing non-valid or missing account numbers, only 590 unique KPC customers could be identified (2,360 bulbs). The reason for the large discrepancy is due to missing account numbers. However, this is expected in any program where a measure is distributed to middle-school aged children. In 2010, 6,188 bulbs were distributed to 1,547 customers. Again, after removing non-valid or missing account numbers, only 603 unique customers could be identified (2,412 bulbs). In total there were 10,708 bulbs distributed to 2,677 customers, of which 4,772 bulbs and 1,193 customers were validated. The percentage of customers and bulbs distributed that would be considered valid is 45%. This is not an unexpected validation percentage due to the inherent forgetful nature of 7th graders. Because the program and potential for energy savings is small, nothing should be done to remedy the lack of valid customers at this time.

Once a valid set of customers was determined, the next step was to use the engineering estimate algorithm for CFLs (Appendix – Impact Methods and Assumptions) to determine an average per-participant energy, summer peak, and winter peak savings value. To calculate annualized energy savings, an average per-CFL savings must be determined based on the wattage of the bulb being removed (base wattage) and the wattage of the bulb being installed (replacement wattage). The difference in wattage is the per-hour usage, and this number is multiplied by the total number of bulbs installed, the average hours per day, and the average days per year of use to determine the per-participant, per-year usage. Once the average per-participant annualized savings were determined, values were discounted to account for the persistence of the measure. This new per-participant savings value is the "Gross" savings. To determine the "Net" savings, the gross savings number is multiplied by one minus the free ridership percentage and one plus the spillover percentage. To complete the savings calculation, transmission and distribution losses are accounted for, so that numbers can be presented at a level equivalent to generation. Going forward, the per-participant assumptions for estimating savings should be as follows

2009 and 2010 Average Per-Participant Savings

Statistic	kWh	kW Summer	kW Winter
Per-Participant Savings	222	0.054	0.033

For 2009, KPC had goals of providing 1,200 customers with CFLs and saving KPC customers 221 MWh, 5 kW in summer peak demand, and 110 kW in winter peak demand savings. The program was able to provide 1,130 participants with CFLs, and produce net annualized total program savings of 251 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized summer peak demand reductions were 61 kW and the net annualized winter peak demand reductions were 30 kW. KPC met 94% of the participant target, 113% of the energy target, 1,267% of the summer demand target, and 28% of the winter demand target.

For 2010, KPC had goals of providing 1,700 customers with CFLs and saving KPC customers 313 MWh, 17 kW in summer peak demand, and 156 kW winter peak demand savings. The program was able to provide 1,547 participants with CFLs, and produce net annualized total program savings of 343 MWh of energy savings, including transmission and distribution losses, persistence, and free ridership. The net annualized summer peak demand reductions were 83 kW and the net annualized winter peak demand reductions were 42 kW. KPC met 91% of the participant target, 110% of the energy target, 1,225% of the summer demand target, and 27% of the winter demand target.

For the first two years of the EEFS program, KPC was able to distribute 10,708 bulbs to 2,677 customers, producing net annualized program savings of 594 MWh of energy savings, 144 kW in summer demand and 72 kW in winter demand peak reductions. As a whole, KPC was able to meet 92% of the participant target, 111% of the energy target, 1,242% of the summer demand target, and 27% of the winter demand target.

Participation numbers were near the expected goals, and the total energy savings and summer demand savings were higher than expected. However, the winter peak demand savings was much lower. This was due to the participant survey results showing the bulbs being on more than expected during summer peak demand hours, and less than expected during winter peak demand hours. There are a multitude of reasons why the winter peak hour usage is low, though at this time any opinion tendered would be speculation without a more in depth survey from which to compare. The most likely reason for the low usage is that between 7am and 9am students are not in the primary rooms listed (living room, bedroom), but instead are in the bathroom or dining room. Installing bulbs in these locations would likely increase the potential winter demand savings, but it would also likely lower the annual energy savings due to the low utilization of bathrooms and dining rooms compared to other rooms.

Impact Results

The four key statistics used in an impact evaluation – number of participants, energy savings, summer peak demand reduction, winter peak demand reduction – are shown below. Included in the table are the program goals, the *ex-ante* savings, and the *ex-post* savings. *Ex-ante* savings are forecasted savings as reported by the program staff during the program's implementation. *Ex-post* savings are estimated savings as determined by the impact evaluation and reported in the evaluation report.

Impact Evaluation Results by Year

Category	Goal	Ex-ante	Ex-post	Percent of Goal
2009				
Participants	1,200	1,130	1,130	94%
Bulbs	4,800	4,520	4,520	94%
Energy (MWh)	221	208	251	113%
Summer Demand (kW)	5	5	61	1,267%
Winter Demand (kW)	110	104	30	28%
2010				
Participants	1,700	1,547	1,547	91%
Bulbs	6,800	6,188	6,188	91%
Energy (MWh)	313	285	343	110%
Summer Demand (kW)	7	6	83	1,225%
Winter Demand (kW)	156	142	42	27%
Total				
Participants	2,900	2,677	2,677	92%
Bulbs	11,600	10,708	10,708	92%
Energy (MWh)	534	493	594	111%
Summer Demand (kW)	12	11	144	1,242%
Winter Demand (kW)	267	246	72	27%

Cost Effectiveness Evaluation

AEP uses a cost effectiveness framework based on the 2002 California Standard Practice Manual: Economic Analysis for Demand-Side Programs and Projects. Four benefit cost tests were used as defined in the California Standard Practice Manual: Participant test (PCT), Ratepayer Impact Measure test (RIM), Total Resource Cost test (TRC), and the Program Administrator Cost test (PACT). In addition to the tests, costs of conserved energy will be calculated from the utility perspective. Within this framework, total program benefits are compared to total program costs. Program benefits are defined as the expected kWh/kW saving attributed to the program. These kWh/kW savings are then multiplied by the Company's most recently filed long-run incremental cost (value of avoided generation, transmission, distribution, line losses). The benefits can be expected to accrue over the life of the measure. The dollar value of these benefits may vary over time, reflecting changes in the cost of alternative supply sources and expected inflation. Costs associated with the program include all costs contributing to the realization of program benefits, regardless of who incurs the cost. Traditionally, included in the program costs are all labor costs, miscellaneous materials and expenses, Company paid rebates, promotional expenditures and any participant expenditures exceeding the Company rebate. For purposes of reporting and cost recovery in Kentucky, only costs incremental to the Company after beginning the program offerings are included in the costs. Employee labor costs are not included, unless new labor was utilized incrementally and specifically for DSM program implementation.

For 2009, the total program costs as filed were \$17,184, of which \$12,184 were listed as incentives. However, these costs do not include the unrecoverable administrative costs from KPC staff and AEPSC staff. An estimated \$6,000 was included under administration to account for unrecoverable costs, bringing the total to \$23,184 in actual costs related to the program. In 2010, the total filed program costs were \$22,019, of which \$17,019 were incentives. To account for unrecoverable admin costs and the costs from the 2010 evaluation of 2009 activity, another \$10,562 and \$4,179 were added to account for admin and evaluation costs respectively. As a whole, costs for this program are very low. Since the general rule for determining the cost of an evaluation is to use 5-10% of the total program cost, the ability to provide a robust analysis will be limited.

DSMore, an industry standard energy efficiency analysis software package, was utilized to perform the cost-benefit analysis tests from the California Standard Practice Manual. While costs as reported contain only the costs recoverable under the KPC DSM rider, the cost-benefit analysis attempted to account for all costs related to program implementation and evaluation. Therefore an estimate of the value of KPC and AEP Service Corporation (AEPSC) staff time utilized to implement and evaluate the program was added to the reported costs. The below table shows the breakdown by category of the costs used in the analysis.

Program Costs by Year and Type

Year	Administration	Promotions	Incentives	Evaluation	Total
2009	\$6,000	\$5,000	\$12,184	\$0	\$23,184
2010	\$10,562	\$5,000	\$17,019	\$4,179	\$36,760
2011	\$0	\$0	\$0	\$5,000	\$5,000

Goals were reported as total amounts respective to the winter peak only, however, both summer and winter peak comparisons were used in the analysis – summer to account for KPC being in the AEP generation pool that experiences summer peaking conditions, and winter to account for KPC's maximum system load that occurs in the winter.

The results for the benefit/cost tests show that the program was cost-effective from Participant, Program Administrator, and Total Resource perspectives, although each ratio underperformed compared to projections in the program filing. The expected Total Resource Cost ratio was 8.09, Participant Cost ratio was 2.39, Ratepayer Impact Measure ratio was 3.06, and Program Administrator Cost ratio was 30.28. Contributing factors for this underperformance are most likely due to changes in the calculations of energy savings during the later years of the CFL bulb life. The Energy Independence and Security Act of 2007 (EISA) sets efficiency requirements for lighting that will cause the phasing out of most incandescent bulbs. This will increase the efficiency of the baseline comparison to the CFL, which justifies a discount in the future potential savings.

2009 and 2010 Summer Peak Cost Effectiveness Analysis

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	2.00	\$ 62,000	\$ 123,718	\$ 61,718
Total Resource Cost (TRC)	2.28	\$ 69,565	\$ 123,718	\$ 54,153
Ratepayer Impact Measure (RIM)	0.50	\$ (125,251)	\$ 123,718	\$ 248,969
Participant Cost (PCT)	N/A	\$ 244,136	\$ 244,136	\$ -

2009 and 2010 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.79	\$ 48,941	\$ 110,659	\$ 61,718
Total Resource Cost (TRC)	2.04	\$ 56,507	\$ 110,659	\$ 54,153
Ratepayer Impact Measure (RIM)	0.44	\$ (138,309)	\$ 110,659	\$ 248,969
Participant Cost (PCT)	N/A	\$ 244,136	\$ 244,136	\$ -

Prospective Analysis

The goal of a prospective analysis is to determine if, based on the current evaluation, there will be any changes to the cost effectiveness of the program in future years. Any number of factors may change the cost effectiveness, including but not limited to: changes in technology, increases in efficiency, saturation of a measure in the market, reduction of market potential due to economic factors, or changes in standards, codes, and baselines.

To prospectively analyze the EEFS program, results from the current evaluation were used as the starting point for the cost-benefit analysis. Future savings values were discounted due to increasing the free ridership percent as a result of effects from the Energy Independence and Security Act of 2007. While the reduction in savings could be attributed to an increase in efficiency in the baseline technology, thus reducing the per-bulb savings, it is more likely that future participants will simply not have an opportunity to purchase incandescent bulbs, thus an increase in free ridership. Currently, CFLs are ubiquitous at most big-box retailers and home stores reducing the availability of incandescent bulbs. However, the lower annualized energy savings due to the lack of incandescent bulbs is offset by an increase in the cost of avoided energy in future years. There are also concerns about the delivery mechanism in regards to free ridership. Because the CFLs are distributed to children, and not the predominant consumer in the house (parent/guardian), there is a higher probability that the option to receive free CFLs is not even available.

Due to the closeness of the 2009 and 2010 cost benefit analysis, only the winter peak cost benefit analysis was run. The results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective.

2012-2014 Winter Peak Cost Effectiveness Analysis

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.28	\$ 37,969	\$ 174,606	\$ 136,638
Total Resource Cost (TRC)	1.65	\$ 68,732	\$ 174,606	\$ 105,875
Ratepayer Impact Measure (RIM)	0.47	\$ (194,874)	\$ 174,606	\$ 369,481
Participant Cost (PCT)	N/A	\$ 203,517	\$ 203,517	\$ -

Recommendations

The following recommendations are based solely on the expert opinions of the EE/DR Analytics team in regards to future years of the EEFS program.

- 1) Results of the prospective analysis show that continuation of the program into 2012-2014 is expected to be cost effective. However, due to the relative uncertainty of the DSMore model in using stochastic models, the opportunity for the program to become cost ineffective is a very real possibility. It is our recommendation that this program be reviewed by KPC staff for potential replacement in the EE Portfolio. Potential options for improved measure savings would be to substitute LEDs for CFLs, or include some weatherization measures as a kit.
- 2) Greater scrutiny should be applied to data collection and tracking. Every customer list should have at a minimum, the customer's utility bill account number in the same format as it is stored in the CIS, the install date of the measure (handout date), and number and wattage of the CFLs.
- 3) Future costs should be captured in a more organized and delineated manner. Each program should have its own accounting area (project ID), separate from other KPC business. Within each project, there should be a consistent set of cost descriptions for each program to account for utility admin, implementation admin, materials, marketing, incentives, and evaluation.
- 4) On-going program management should be handled by KPC staff, including tracking of customer participation and estimated ex-ante savings.
- 5) KPC staff labor time spent on the Program should be captured so that the true total cost of delivering the program can be known.
- 6) To increase teacher workshop participation, consideration should be given to providing an additional incentive to the teachers related to their time requirements for attending the workshop.
- 7) An additional survey of the participants should be conducted to determine the persistence of the savings over the expected CFL life.
- 8) Education materials should be reexamined to ensure that the bulbs are recommended to be installed in an area to gain the maximum savings.

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
- II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
- III. PJM Forward Market Operations. Energy Efficiency Measurement & Verification. Revision 01. March 1, 2010.
- IV. Vermont Energy Investment Corporation. State of Ohio Energy Efficiency Technical Reference Manual. Ohio TRM – Draft 8-6-2010. Public Utilities Commission of Ohio, 2010. PDF. 6 August 2010.

- V. Ohio Electric Utilities. Draft Technical Reference Manual (TRM) for Ohio Senate Bill 221 Energy Efficiency and Conservation Program and 09-512-GE-UNC. September/October 2009.
- VI. Morrison, Richard. Kentucky Power Company DSM Program Template. Kentucky Power Company Program Template for DSM Programs Revised 052010 Expand Redline. MS Excel Workbook. 20 May 2010.
- VII. AEP Load Research Analysis Evaluation Report for the Energy Education for Students Program in Kentucky Power Company Program Period: January 2009 – December 2009. August 2010.
- VIII. Sonderegger, Robert C. A Baseline Model for Utility Bill Analysis Using Both Weather and Non-Weather Related Variables. June 1998.
- IX. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
- X. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
- XI. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.

Appendix - Impact Methods and Assumptions

Impact Methods

For the purposes of this evaluation, impacts were based on an annualized incremental savings method. An annualized incremental savings is equivalent to what a customer would save in the first year of the measure installation, assuming the measure was installed on January 1st of that year. That savings was applied for each year of the measure's life, with savings discounted after the EISA Act of 2007 which reduces the availability for savings in future years due to lack of available alternatives. A calculated energy savings is the savings that is expected over the life of the measure, from the date the customer received/installed the measure, to the completion of the measure's expected life. The calculated measure is used to determine Net Loss Savings. Both analyses speak to the efficacy of the measure in both the initial expected impact from an average installation and also the long-term savings from the specific installations.

Technology Description

A low wattage ENERGY STAR qualified compact fluorescent screw-in bulb (CFL) is purchased through a retail outlet in place of an incandescent screw-in bulb. The incremental cost of the CFL compared to the incandescent light bulb is offset via either rebate coupons or via upstream markdowns. Assumptions are based on a time of sale purchase, not as a retrofit or direct install installation. This characterization assumes that the CFL is installed in a residential location. Where the implementation strategy does not allow for the installation location to be known and absent verifiable evaluation data to support an appropriate residential versus commercial split, it is recommended to use this residential characterization for all purchases to be appropriately conservative in savings assumptions.

Algorithms

$$kWh = \frac{(W_{base} - W_{replace})}{1000} \times (H \times 365) \times (1 + IF)$$

$$kW = \frac{(W_{base} - W_{replace})}{1000} \times CF \times (1 + IF)$$

Terms

Term	Description
kWh	Energy Savings.
kW	Demand Savings.
W _{base}	Wattage of bulb being removed.
W _{replace}	Wattage of bulb being installed.
H	Average Daily hours-of-use.
IF	Interactive Factor.
CF	Coincidence Factor.

Validation Rules

Rule
1. Customer must have a valid bill account number with the utility.
2. Customer's account must have been active prior to the measure being received until the date of the analysis (or the end of the measure's expected life).
3. Measure must have been installed during the program's implementation period (for this program, 2009-2010).

Assumptions

Assumption	Value
Program Start	January 1 st , 2009
Program End	December 31 st , 2010
Free Ridership	27%
Spillover	0%
Energy Losses (whole year)	8.7%
Demand Losses (at peak)	10.8%
Installation Ratio	61.1%
Measure's expected life in years	6
Average Daily Hours of Use	4.5
Days per year of Use	351
Energy Waste Heat Factor	1.07
Demand Waste Heat Factor	1.21
Summer Coincidence Factor	0.29
Winter Coincidence Factor	0.27

EISA Discounts

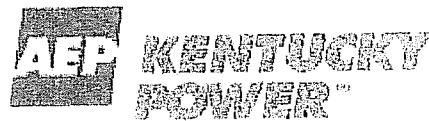
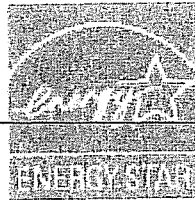
Percentage Adjustments for Energy Star Lighting with Base Wattage					
Watts Low	Watts High	<= 2011	2012	2013	>= 2014
0	15	100%	100%	100%	63%
16	20	100%	100%	62%	62%
21	∞	100%	63%	63%	63%

Wattage Adjustments for Energy Star Lighting without Base Wattage					
Watts Low	Watts High	<= 2011	2012	2013	>= 2014
0	15	3.25	3.25	3.25	2.05
16	20	3.25	3.25	2.00	2.00
21	∞	3.25	2.06	2.06	2.06

Appendix – Exhibits

Exhibit 1 – Cover Sheet of Workshop Manual

Change the World, Start with ENERGY STAR®



In partnership with

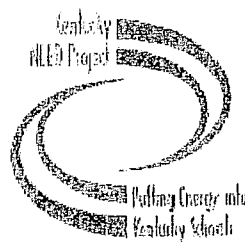
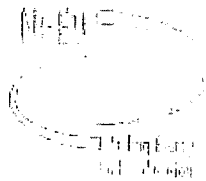


Exhibit 2 – Teacher's Guide (page 1)

Change the World
Start with ENERGY STAR®
NEED Teacher Guide

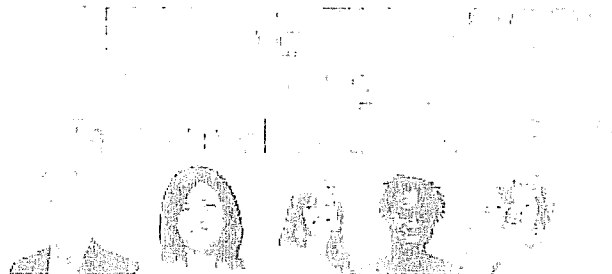


THE NEED PROJECT
P.O. BOX 10101 • MAMASSAS, VA 20108
1-800-875-5029 • www.NEED.org

Exhibit 3 – Teacher's Guide (page 2)

Table of Contents

Invitation to Participate	3
NCEC Teacher Guide	4
Levels of Campaign Involvement	4-8
Get the Facts about ENERGY STAR® Qualified CFLs	5-10
10 Ways to Save	11
Get the Facts about Mercury	12-13
Elementary Electricity	14-17
Intermediate Electricity	18-20
Home Activity	20-31
School Activity	32
Change a Light Bulb	33-35
Harry Spatter and the Quest for the Right Light	36-39
Letter to Parents	44
ENERGY STAR® Pledge Sheet	45



"I will do my part to save energy and help fight global warming. I Pledge to change a light and do even more."

- Replace at least one light in my home with an ENERGY STAR® qualified one.
- Make sure my home is well sealed and insulated.
- Choose ENERGY STAR® qualified equipment for my home office.
- Enable my ENERGY STAR® computer and monitor to sleep while I'm away.
- Choose ENERGY STAR® qualified products for my kitchen and laundry.

Exhibit 4 – Data Collection Form

Dear Parent or Guardian:

Kentucky Power in partnership with the National Energy Education Development (NEED) Project will be providing energy education materials and a package of four (4) compact fluorescent bulbs (approximate cost \$10) to 7th grade students within the Kentucky Power service territory. To verify that you are a Kentucky Power customer, please provide the following information on behalf of your student and have him or her return it to their classroom.

Customer (Account) Name _____


Address _____

City _____

State Kentucky _____ (Please do not print abbreviations)

Zip _____ Phone _____

Kentucky Power Electricity Bill Account Number. Example: 603-000-600-0-0

Thank you for participating in Kentucky Power's Energy Education for Students Program. 

Dear Parent or Guardian:

Kentucky Power in partnership with the National Energy Education Development (NEED) Project will be providing energy education materials and a package of four (4) compact fluorescent bulbs (approximate cost \$10) to 7th grade students within the Kentucky Power service territory. To verify that you are a Kentucky Power customer, please provide the following information on behalf of your student and have him or her return it to their classroom.

Customer (Account) Name _____


Address _____

City _____

State Kentucky _____ (Please do not print abbreviations)

Zip _____ Phone _____

Kentucky Power Electricity Bill Account Number. Example: 060-000-000-0-0

Thank you for participating in Kentucky Power's Energy Education for Students Program. 

Appendix – Survey

Kentucky Power
CFL Distribution Program Study
Energy Education For Students
Segment Report



Thoroughbred Research Group
1941 Bishop Lane Suite 1017
Louisville, KY 40218
www.torinc.net

Research Methodology

Project Background

Kentucky Power implemented a program to distribute packages of compact fluorescent lights (CFLs) to residents of their service area by distributing complimentary four-packs of CFLs through local schools. In an effort to estimate the effectiveness of the program and to better understand consumer behavior related to the distribution, Kentucky Power and AEP contracted with Thoroughbred Research Group to conduct a survey among residential customers who received one or more of the four-pack CFLs for use in their homes.

Specific objectives of the research included:

- Document the extent to which the 4-pack CFLs are currently in use in homes
- Determine the types of bulbs the CFLs replaced and the wattage of bulbs replaced (if replacing incandescent bulbs)
- Measure the amount of time the CFLs are in use
- Identify where in the home the CFLs have been installed
- Determine general levels of satisfaction with the CFL distribution program

Research Methodology

This study consisted of a telephone survey of 121 Kentucky Power customers who had received one or more of the CFL packs through the school outreach program. Kentucky Power supplied Thoroughbred Research with a list of participating customer names and telephone numbers.

Interviews were gathered between May 17 and May 22, 2010. The questionnaire for this study was developed by the staff of AEP and Kentucky Power. Surveys averaged approximately seven minutes to complete.

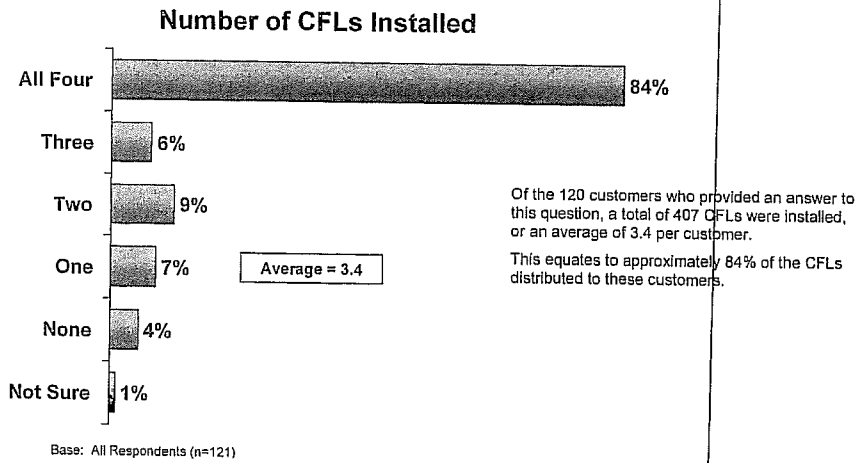
Representing a population of 507 unique customer households, this sample of 121 interviews produces results accurate to within no more than plus or minus 6.5 percentage points at 90% confidence.

Key Findings

1. Among the 121 respondents in this study, we asked each respondent to detail the experience with the most recent 4-pack of CFLs they received from Kentucky Power (in the event they received more than one package). With descriptions on a total of 484 CFLs (121 x 4), we found that:
 - 331 of the CFLs are currently still in use in the home (68%)
 - 76 were installed but are no longer in use (16%)
 - 77 were never installed (16%)
2. Nearly eight out of ten participants reported having used the CFLs to replace one or more incandescent bulbs. About 71% of the total CFLs distributed replaced an incandescent bulb, with an average wattage of 65 watts.
3. On average, the CFLs distributed through this program that are still in use are operating 4.6 hours per day.
4. Two-thirds of the CFLs still in use are placed in three areas of the home – a bedroom (27%), the kitchen (25%) and the living room (23%).
5. About four in ten program participants said they had already installed CFLs in their home prior to receiving this pack from Kentucky Power. These customers reported having had an average of 6.9 prior CFLs per household.
6. About one in four (27%) said they did not have any CFLs prior to receiving them from Kentucky Power, but had planned to do so; and 24% said they did not have any prior, but had since purchased additional CFLs.
7. Satisfaction with the CFL bulbs received is very high among program participants -- 95% expressed satisfaction with the bulbs they received.
8. Recall of the educational materials included with the package of CFLs was only 46%. Those who recall the materials, however, were generally satisfied (92%).

Number of CFLs Installed

Nearly three out of four customers reported having installed all of the CFLs they received from Kentucky Power. Only 4% reported they had not yet installed any of the CFLs.

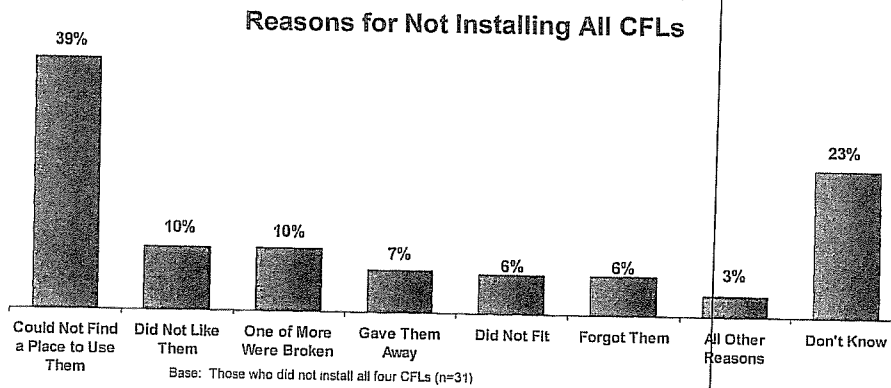


Reasons for Not Installing All CFLs

The 31 respondents (about 26% of the total sample) who did not install all four of the CFLs they received were asked why they had not used all four bulbs.

The dominant reason was not being able to find a place in the home to use all of the bulbs (mentioned by 39%). Another 10% of this group said they did not like the CFLs, and 10% also reported that one or more of the CFLs they received were broken.

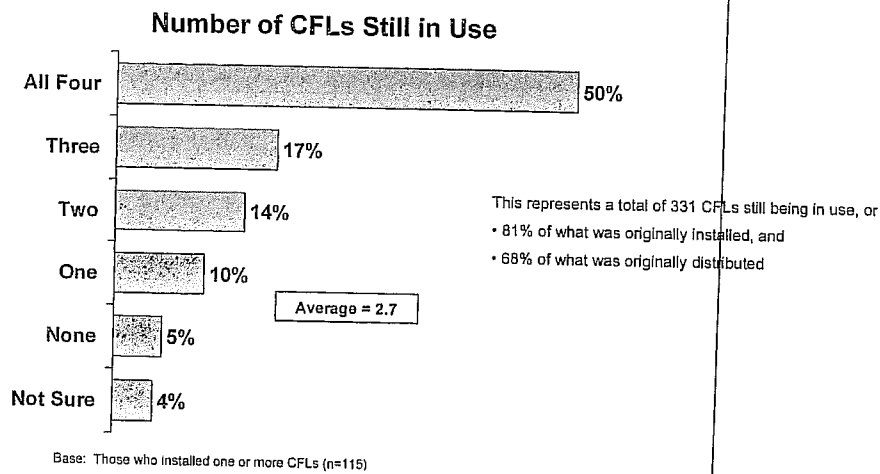
Almost one in four (23%) said they do not know why they have not installed all of the CFLs they received.



THOROUGHbred
 RESEARCH GROUP

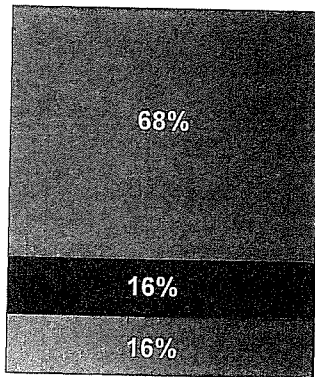
Number of CFLs Still in Use

Among those who originally installed at least one of the CFLs they received, half (50%) say all four CFLs are still in use in their homes. Only 5% reported none of the bulbs they had originally installed are still in use.



Net Distribution, Installation and Use

484 CFL Bulbs
Distributed



The results of this survey indicate that 68% of the CFLs Kentucky Power distributed through its school outreach program are currently being used in customers' homes.

Still in Use = 331

Installed, No Longer in Use/Not Sure if In Use = 76

Never Installed/Not Sure if Installed = 77

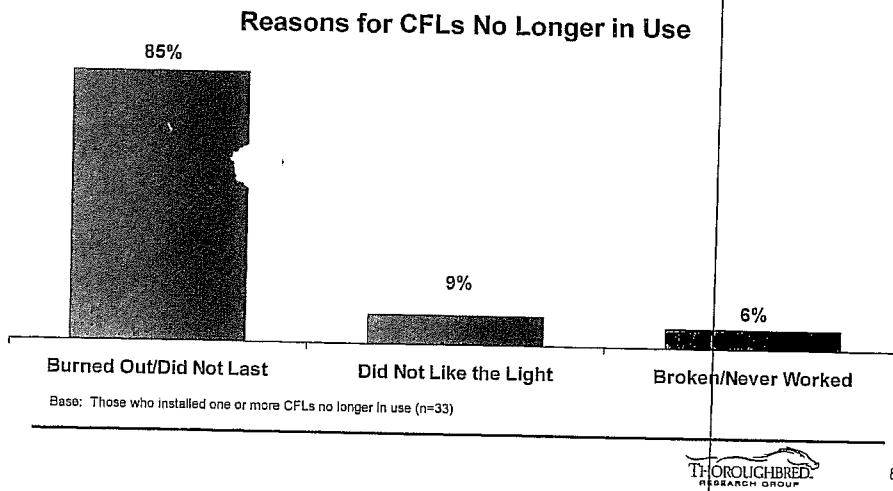
Base: All respondents (n=121)

THOROUGHbred
RESEARCH GROUP

7

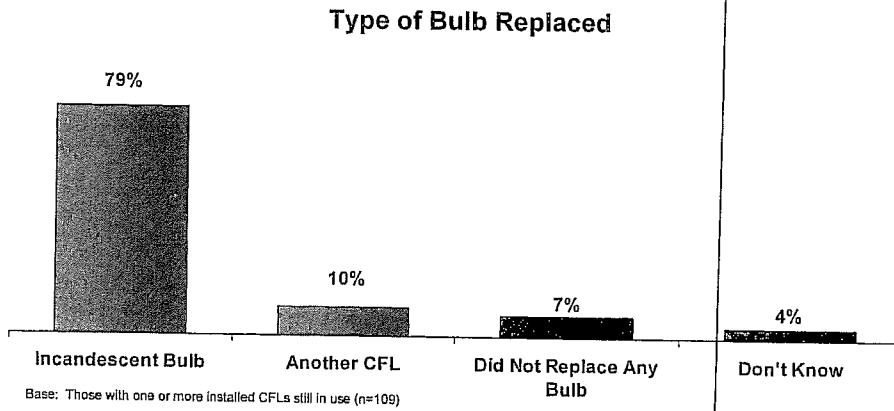
Reasons for CFLs No Longer In Use

The 33 respondents who reported that one or more of the CFLs they originally installed are no longer in use in their home, the primary reason is that the bulbs had burned out and no longer work (mentioned by 85% of this group). Another 9% said they did not like the light the CFL produces, and 6% reported the bulbs were broken or never worked at all.



Type of Bulb Replaced

Nearly eight out of ten reported they used the CFLs they received from Kentucky Power to replace an Incandescent light bulb in their home. Ten percent replaced another CFL in the home, and 7% said the bulbs they received did not replace any previous bulbs in the home.



THOROUGHbred
RESEARCH GROUP

9

Wattage of Incandescent Bulbs Replaced

Those who used the CFLs they received from Kentucky Power to replace one or more incandescent bulbs in their homes (88 of the 121 survey participants) were asked to detail the wattage of each bulb replaced. In total, these respondents gave responses for 262 light bulbs.

Excluding "don't know" responses, 51% of the CFLs replaced a 60-watt incandescent bulb, 30% replaced a 75-watt bulb and 9% replaced a 40-watt bulb.

Wattage of Incandescent Bulbs Replaced

	Number	Percent of All Responses	Percent of Known Wattage
15 Watt	4	2%	2%
40 Watt	23	9%	9%
60 Watt	125	48%	51%
70 Watt	1	< 0.5%	<0.5%
75 Watt	73	28%	30%
80 Watt	2	1%	1%
100 Watt	17	6%	7%
Don't Know	17	6%	
Total	262	100%	100%

In total, these 262 CFLs replaced a 65-watt incandescent bulb on average.

The 262 bulbs detailed in the table at the left represent 54% of the total CFLs distributed, and 79% of the total CFLs still in use.

Base: Those who replaced one or more incandescent bulbs with a CFL (n=88)

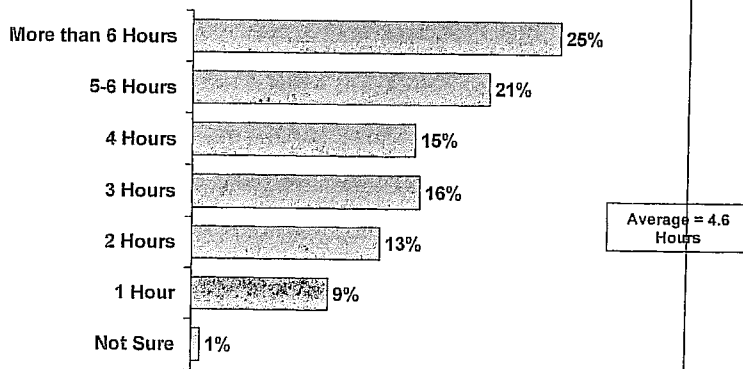


Hours in Use

Respondents with one or more of the CFLs still in use in their home were also asked to how long each bulb is typically used each day in the home.

When aggregating the responses for all 331 CFLs described in this survey, the average daily use was 4.6 hours per CFL still in use.

Hours CFLs Are in Use



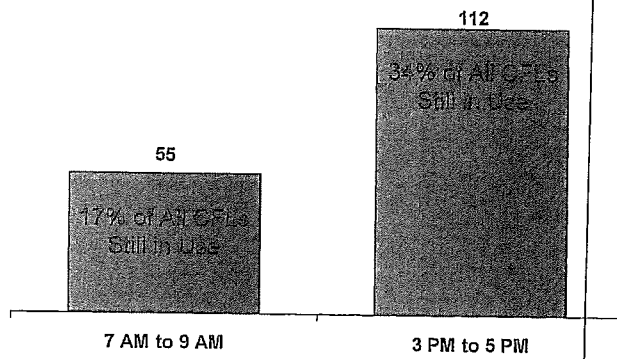
Base: Those with one or more CFLs still in use (n=109)

Peak Hour Use

Of the 331 CFLs described in this study, 55 bulbs (or 17%) were reported to be in use during the morning peak period of 7:00 AM through 9:00 AM

Respondents reported 112 bulbs (or 34%) in use for the afternoon peak time period of 3:00 PM through 5:00 PM.

Bulbs in Use During Peak Times



Base: Those with one or more CFLs still in use (n=109)



Placement of CFLs in Home

Of the 331 CFLs still in use, about two-quarters are used in three areas of the home – a bedroom (27%), the kitchen (25%) and the living room (23%).

Where in Home CFLs are Used

	Number	Percent of All Responses	Percent of Known Placements
Bedroom	90	27%	27%
Kitchen	82	25%	25%
Living Room	76	23%	23%
Bathroom	29	9%	9%
Family/TV Room	14	4%	4%
Entry Hall	14	4%	4%
Outside	9	3%	3%
Dining Room	6	2%	2%
Garage/Basement	5	3%	3%
Laundry Room	4	1%	1%
Home Office	1	<0.5%	<0.5%
Don' Know/No Answer	1	<0.5%	
Total	331	100%	100%

75%

Base: Those with one or more CFLs still in use (n=109)

Experience with Other CFLs in the Home

Fewer than half (41%) reported having had CFLs installed in their home prior to receiving the four-pack from Kentucky Power. Of this group, the average number of previously installed CFLs in the home was 6.9 bulbs.

Other CFLs in the Home

Other CFLs in Home Prior to Receiving 4-Pack from Kentucky Power	41%
<i>Average Number of Previously Installed CFLs</i>	6.9
No CFLs Prior to Receiving 4-Pack from Kentucky Power	59%
• But were planning on getting CFLs	27%
• Have purchased additional CFLs since	24%

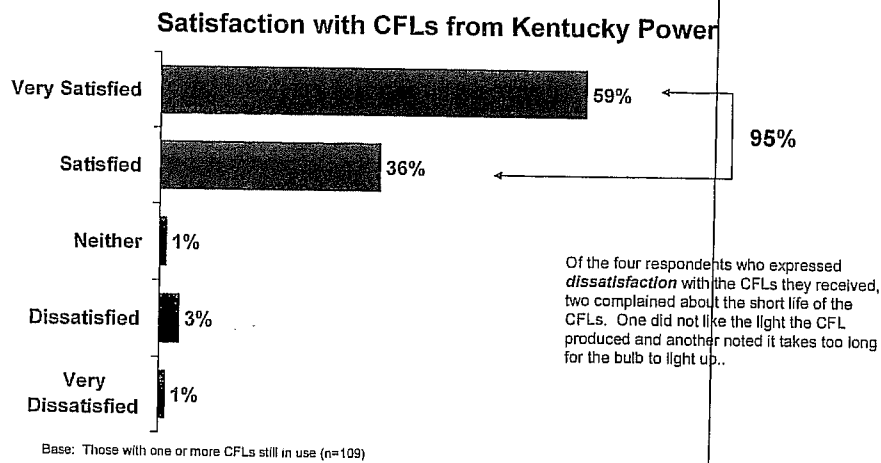
Base: Those with one or more CFLs still in use (n=109)

The remaining 59% reported they did not have any CFLs in their home prior to receiving some from Kentucky Power.

A total of 27% said they were planning on buying some, and 24% said they have since bought additional CFLs for their home.

Satisfaction with CFLs Received

Satisfaction with the CFL distribution program among participants is very high. Ninety-five percent expressed being satisfied with the CFLs they received from Kentucky Power, with 59% indicating they are "very satisfied".



Verbatim Comments:

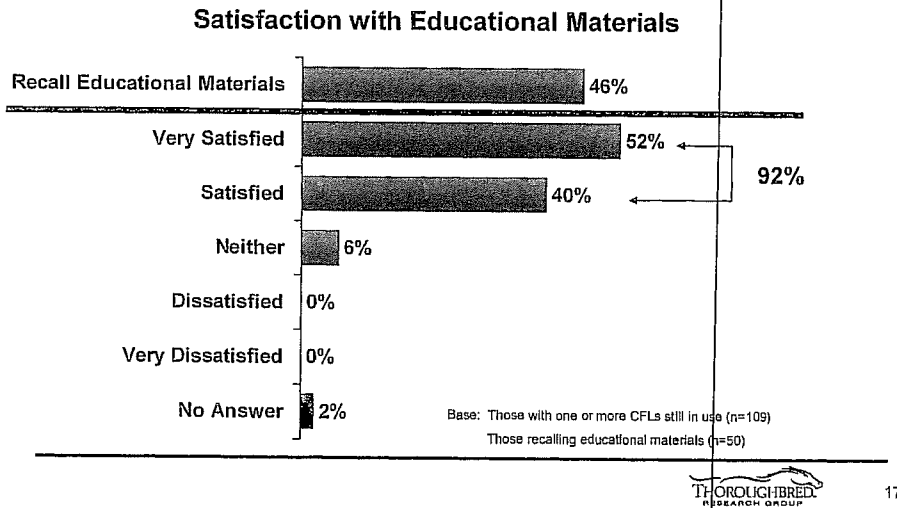
"Why were you dissatisfied with the CLFs you received from Kentucky Power?"

- "I don't like the light that they put out. They don't put out that much light."
- "The light takes too long to light up. That's it."
- "They didn't last long enough and did not put out enough light. That's it."
- "They say they have a life span of five years and they only lasted five or six months. That's all."

Overall Satisfaction with Educational Materials

Fewer than half of those surveys recalled educational materials that were included with the package of CFLs received from their child's school.

Among those who recall the materials, however, 92% expressed satisfaction. The remaining 8% were neutral.



Appendix – Teacher Questionnaire

Questionnaire Sample

Good Morning All,

The Kentucky Power Company (KPC) is in the process of evaluating our 2009 Energy Education for Students Program. KPC is currently designing a survey that will be sent to a random sample of participants. KPC is also very interested in obtaining feedback from participating teachers on how effective the NEED workshop was and the materials contained in the manual. Your answers to the brief survey listed below will help KPC improve the delivery of the program and possibly promote other energy conservation measures through school systems within our service territory.

Thank you in advance for completing the brief questionnaire.

Sincerely,

Don Music
Kentucky Power Company

Phone: (606) 929 1540

Fax: (606) 929 1441

Cell: (606) 922 9954

Survey Questions: Please mark (x) one answer only for each question and return your completed questionnaire in this e-mail to Don Music of KPC.)

1) If you attended the NEED Project workshop in 2009, do you feel this workshop was a valuable educational tool to promote energy conservation measures to teachers, such as the ENERGY STAR® compact fluorescent lights (CFLs)?

100% Yes

0% No

0% I did not attend

2) Do you feel the materials provided in the NEED workshop manual were informational as a teaching tool to educate your students on energy conservation?

100%_ Yes

0%_ No

0%_ Not sure

3) How receptive were your students in understanding the benefits of installing energy conservation measures in their home, such as CFLs?

40%_ very receptive

60%_ somewhat receptive

0%_ not receptive

4) Did you provide any materials from the NEED workshop manual to your students to take home with them?

100%_ Yes

No

Please provide any other comments that you may have that would be helpful to KPC in promoting the Energy Education For Students Program in the future.

No Comments Provided _____

Questionnaire Results

Ten out of a total of fifteen teachers responded to the questionnaire.

Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett
EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves
Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
argraves@aep.com

Joseph Chambers
Load Research Analyst
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols
Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass
EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kivass@aep.com

Marketing

David Tabata
Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek
Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrnicek@aep.com

Brad Berson
Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com





Evaluation Report

Kentucky Power Company Energy Efficiency Portfolio

Evaluation Report for 2009-2010

July 2011

Prepared For:

Kentucky Power Company

Prepared By:

EE/DR Analytics Team
American Electric Power Service Corporation
1 Riverside Plaza, 13th Floor
Columbus, OH 43215

Table of Contents

Executive Summary	4
Program Administrator Cost Test (PACT)	5
Definition	5
Benefits and Costs	5
AEP Generation Pool (Summer) Results	6
Kentucky Power (Winter) Results	6
Total Resource Cost Test (TRC)	7
Definition	7
Benefits and Costs	7
AEP Generation Pool (Summer) Results	8
Kentucky Power (Winter) Results	8
Ratepayer Impact Measure Test (RIM)	9
Definition	9
Benefits and Costs	9
AEP Generation Pool (Summer) Results	10
Kentucky Power (Winter) Results	10
Participant Cost Test (PCT)	11
Definition	11
Benefits and Costs	11
AEP Generation Pool (Summer) Results	12
Kentucky Power (Winter) Results	12
References	13
Appendix – EE/DR Analytics Team Members	14
Load Research	14
EE and Consumer Programs	14
Marketing	14

Executive Summary

Kentucky Power Company (KPC) manages a suite of energy efficiency programs to provide customers with assistance in reducing electric bills and to meet corporate energy efficiency goals. The programs were developed with the assistance of the Kentucky Power Company Demand-Side Management Collaborative (Collaborative) and were approved by the Public Service Commission (PSC) to help meet Kentucky Power's goals. This report provides the cost-benefit evaluation results for the 2009 and 2010 program years. Subsequent sections provide program results and the verbatim description of each of the cost-benefit tests used for the KPC program evaluations as described in the California Standard Practice Manual. The KPC portfolio was cost effective for the 2009 and 2010 program years.

2009 and 2010 Summer Peak Cost Effectiveness Analysis – Program Portfolio

Summer Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.47	\$1,172,433	\$3,681,163	\$2,508,731
Total Resource Cost (TRC)	1.56	\$1,318,387	\$3,681,163	\$2,362,776
Ratepayer Impact Measure (RIM)	0.47	-\$4,112,043	\$3,681,163	\$7,793,207
Participant Cost (PCT)	6.18	\$5,916,499	\$7,058,091	\$1,141,593
TRC with WAP	1.17	\$539,181	\$3,681,163	\$3,141,983
PCT with WAP	6.84	\$6,662,339	\$7,803,931	\$1,141,593

2009 and 2010 Winter Peak Cost Effectiveness Analysis – Program Portfolio

Winter Peak	Ratio	NPV	PV Benefits	PV Costs
Program Administrator Cost (PACT)	1.80	\$2,008,459	\$4,517,191	\$2,508,731
Total Resource Cost (TRC)	1.91	\$2,154,414	\$4,517,191	\$2,362,776
Ratepayer Impact Measure (RIM)	0.58	-\$3,276,017	\$4,517,191	\$7,793,207
Participant Cost (PCT)	6.18	\$5,916,499	\$7,058,091	\$1,141,593
TRC with WAP	1.44	\$1,375,208	\$4,517,191	\$3,141,983
PCT with WAP	6.84	\$6,662,339	\$7,803,931	\$1,141,593

2009 and 2010 Per Participant and Total Savings by Program and Sub Group

Program	Sub Group	Per Participant Savings			Total Program Savings		
		kWh	kW Summer	kW Winter	MWh	kW Summer	kW Winter
COCFL		248	0.052	0.049	2,119	448	417
EEFS		222	0.054	0.033	594	144	72
HEHP	Resistance	1,342	(0.140)	0.520	460	(48)	178
HEHP	Replacement	1,698	(0.020)	0.590	1,233	(15)	428
MEF		651	(0.030)	0.240	1,304	(60)	480
MHHP		2,583	0.460	0.760	1,015	181	299
MHNC		1,681	0.455	0.101	692	188	101
TEE	All-Electric	1,962	0.280	0.510	1,187	169	309
TEE	Non-All-Electric	873	0.220	0.140	120	30	19
Total Portfolio Savings					8,724	1,037	2,303

Program Administrator Cost Test (PACT)

Definition

The Program Administrator Cost Test measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC benefits. Costs are defined more narrowly.

Benefits and Costs

The benefits for the Program Administrator Cost Test are the avoided supply costs of energy and demand, the reduction in transmission, distribution, generation, and capacity valued at marginal costs for the periods when there is a load reduction. The avoided supply costs should be calculated using net program savings, savings net of changes in energy use that would have happened in the absence of the program. For fuel substitution programs, benefits include the avoided supply costs for the energy-using equipment not chosen by the program participant only in the case of a combination utility where the utility provides both fuels.

The costs for the Program Administrator Cost Test are the program costs incurred by the administrator, the incentives paid to the customers, and the increased supply costs for the periods in which load is increased. Administrator program costs include initial and annual costs, such as the cost of utility equipment, operation and maintenance, installation, program administration, and customer dropout and removal of equipment (less salvage value). For fuel substitution programs, costs include the increased supply costs for the energy-using equipment chosen by the program participant only in the case of a combination utility, as above.

In this test, revenue shifts are viewed as a transfer payment between participants and all ratepayers. Though a shift in revenue affects rates, it does not affect revenue requirements, which are defined as the difference between the net marginal energy and capacity costs avoided and program costs. Thus, if $NPV_{pa} > 0$ and $NPV_{RIM} < 0$, the administrator's overall total costs will decrease, although rates may increase because the sales base over which revenue requirements are spread has decreased.

AEP Generation Pool (Summer) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the PACT test at Summer Peak. For this test, Weatherization Assistance Program (WAP) dollars do not apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL	3.51	\$259,299	\$362,492	\$103,194
EEFS	2.00	\$62,000	\$123,718	\$61,718
HEHP	1.31	\$165,856	\$702,324	\$536,468
MEF	0.62	-\$274,063	\$450,187	\$724,250
MHHP	3.28	\$470,444	\$676,565	\$206,121
MHNC	1.92	\$225,232	\$470,462	\$245,230
TEE w/ WAP				
TEE w/o WAP	1.42	\$263,665	\$895,415	\$631,750
Portfolio	1.47	\$1,172,433	\$3,681,164	\$2,508,731

Kentucky Power (Winter) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the PACT test at Winter Peak. For this test, Weatherization Assistance Program (WAP) dollars do not apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL	3.47	\$254,528	\$357,722	\$103,194
EEFS	1.79	\$48,941	\$110,659	\$61,718
HEHP	2.27	\$679,564	\$1,216,032	\$536,468
MEF	0.90	-\$74,873	\$649,377	\$724,250
MHHP	3.72	\$560,865	\$766,986	\$206,121
MHNC	1.67	\$165,093	\$410,323	\$245,230
TEE w/ WAP				
TEE w/o WAP	1.59	\$374,341	\$1,006,092	\$631,750
Portfolio	1.80	\$2,008,460	\$4,517,191	\$2,508,731

Total Resource Cost Test (TRC)

Definition

The Total Resource Cost Test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs.

The test is applicable to conservation, load management, and fuel substitution programs. For fuel substitution programs, the test measures the net effect of the impacts from the fuel not chosen versus the impacts from the fuel that is chosen as a result of the program. TRC test results for fuel substitution programs should be viewed as a measure of the economic efficiency implications of the total energy supply system (gas and electric).

A variant on the TRC test is the Societal Test. The Societal Test differs from the TRC test in that it includes the effects of externalities (e.g., environmental, national security), excludes tax credit benefits, and uses a different (societal) discount rate.

Benefits and Costs

This test represents the combination of the effects of a program on both the customers participating and those not participating in a program. In a sense, it is the summation of the benefit and cost terms in the Participant and the Ratepayer Impact Measure tests, where the revenue (bill) change and the incentive terms intuitively cancel (except for the differences in net and gross savings).

The benefits calculated in the Total Resource Cost Test are the avoided supply costs, the reduction in transmission, distribution, generation, and capacity costs valued at marginal cost for the periods when there is a load reduction. The avoided supply costs should be calculated using net program savings, savings net of changes in energy use that would have happened in the absence of the program. For fuel substitution programs, benefits include the avoided device costs and avoided supply costs for the energy, using equipment not chosen by the program participant.

The costs in this test are the program costs paid by the utility and the participants plus the increase in supply costs for the periods in which load is increased. Thus all equipment costs, installation, operation and maintenance, cost of removal (less salvage value), and administration costs, no matter who pays for them, are included in this test. Any tax credits are considered a reduction to costs in this test. For fuel

substitution programs, the costs also include the increase in supply costs for the utility providing the fuel that is chosen as a result of the program.

AEP Generation Pool (Summer) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the TRC test at Summer Peak. For this test, Weatherization Assistance Program (WAP) dollars apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL	4.23	\$276,697	\$362,492	\$85,795
EEFS	2.28	\$69,565	\$123,718	\$54,153
HEHP	1.01	\$4,779	\$702,324	\$697,545
MEF	0.80	-\$114,192	\$450,187	\$564,379
MHHP	4.61	\$529,875	\$676,565	\$146,690
MHNC	2.58	\$287,998	\$470,462	\$182,464
TEE w/ WAP	0.63	-\$515,541	\$895,415	\$1,410,957
TEE w/o WAP	1.42	\$263,665	\$895,415	\$631,750
Portfolio w/ WAP	1.17	\$539,181	\$3,681,163	\$3,141,983
Portfolio w/o WAP	1.56	\$1,318,387	\$3,681,163	\$2,362,776

Kentucky Power (Winter) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the TRC test at Winter Peak. For this test, Weatherization Assistance Program (WAP) dollars apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL	4.17	\$271,926	\$357,722	\$85,795
EEFS	2.04	\$56,507	\$110,659	\$54,153
HEHP	1.74	\$518,487	\$1,216,032	\$697,545
MEF	1.15	\$84,998	\$649,377	\$564,379
MHHP	5.23	\$620,296	\$766,986	\$146,690
MHNC	2.25	\$227,859	\$410,323	\$182,464
TEE w/ WAP	0.71	-\$404,865	\$1,006,092	\$1,410,957
TEE w/o WAP	1.59	\$374,341	\$1,006,092	\$631,750
Portfolio w/ WAP	1.44	\$1,375,208	\$4,517,191	\$3,141,983
Portfolio w/o WAP	1.91	\$2,154,414	\$4,517,191	\$2,362,776

Ratepayer Impact Measure Test (RIM)

Definition

The Ratepayer Impact Measure (RIM) test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementations are less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

Benefits and Costs

~~The benefits calculated in the RIM test are the savings from avoided supply costs. These avoided costs~~ include the reduction in transmission, distribution, generation, and capacity costs for periods when load has been reduced and the increase in revenues for any periods in which load has been increased. The avoided supply costs are a reduction in total costs or revenue requirements and are included for both fuels for a fuel substitution program. The increases in revenues are also included for both fuels for fuel substitution programs. Both the reductions in supply costs and the revenue increases should be calculated using net energy savings.

The costs for this test are the program costs incurred by the utility, and/or other entities incurring costs and creating or administering the program, the incentives paid to the participant, decreased revenues for any periods in which load has been decreased and increased supply costs for any periods when load has been increased. The utility program costs include initial and annual costs, such as the cost of equipment, operation and maintenance, installation, program administration, and customer dropout and removal of equipment (less salvage value). The decreases in revenues and the increases in the supply costs should be calculated for both fuels for fuel substitution programs using net savings.

AEP Generation Pool (Summer) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the RIM test at Summer Peak. For this test, Weatherization Assistance Program (WAP) dollars do not apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL	0.53	-\$319,814	\$362,492	\$682,306
EEFS	0.50	-\$125,251	\$123,718	\$248,969
HEHP	0.37	-\$1,176,820	\$702,324	\$1,879,144
MEF	0.32	-\$970,509	\$450,187	\$1,420,696
MHHP	0.65	-\$361,547	\$676,565	\$1,038,112
MHNC	0.61	-\$304,310	\$470,462	\$774,772
TEE w/ WAP				
TEE w/o WAP	0.51	-\$853,792	\$895,415	\$1,749,208
Portfolio	0.47	-\$4,112,043	\$3,681,163	\$7,793,207

Kentucky Power (Winter) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the RIM test at Winter Peak. For this test, Weatherization Assistance Program (WAP) dollars do not apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL	0.52	-\$324,585	\$357,722	\$682,306
EEFS	0.44	-\$138,309	\$110,659	\$248,969
HEHP	0.65	-\$663,113	\$1,216,032	\$1,879,144
MEF	0.46	-\$771,319	\$649,377	\$1,420,696
MHHP	0.74	-\$271,126	\$766,986	\$1,038,112
MHNC	0.53	-\$364,449	\$410,323	\$774,772
TEE w/ WAP				
TEE w/o WAP	0.58	-\$743,116	\$1,006,092	\$1,749,208
Portfolio	0.58	-\$3,276,017	\$4,517,191	\$7,793,207

Participant Cost Test (PCT)

Definition

The Participants Test is the measure of the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.

Benefits and Costs

The benefits of participation in a demand-side program include the reduction in the customer's utility bill(s), any incentive paid by the utility or other third parties, and any federal, state, or local tax credit received. The reductions to the utility bill(s) should be calculated using the actual retail rates that would have been charged for the energy service provided (electric demand or energy or gas). Savings estimates should be based on gross savings, as opposed to net energy savings.

In the case of fuel substitution programs, benefits to the participant also include the avoided capital and operating costs of the equipment/appliance not chosen. For load building programs, participant benefits include an increase in productivity and/or service, which is presumably equal to or greater than the productivity/ service without participating. The inclusion of these benefits is not required for this test, but if they are included then the societal test should also be performed.

The costs to a customer of program participation are all out-of-pocket expenses incurred as a result of participating in a program, plus any increases in the customer's utility bill(s). The out-of-pocket expenses include the cost of any equipment or materials purchased, including sales tax and installation; any ongoing operation and maintenance costs; any removal costs (less salvage value); and the value of the customer's time in arranging for the installation of the measure, if significant.

AEP Generation Pool (Summer) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the PCT test at Summer Peak. For this test, Weatherization Assistance Program (WAP) dollars apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL		\$734,082	\$734,082	\$0
EEFS		\$244,136	\$244,136	\$0
HEHP	2.21	\$962,272	\$1,759,397	\$797,126
MEF		\$1,274,458	\$1,274,458	\$0
MHHP	8.00	\$1,042,743	\$1,191,775	\$149,032
MHNC	3.66	\$519,667	\$715,102	\$195,435
TEE w/ WAP		\$1,884,981	\$1,884,981	\$0
TEE w/o WAP		\$1,139,141	\$1,139,141	\$0
Portfolio w/ WAP	6.84	\$6,662,339	\$7,803,931	\$1,141,593
Portfolio w/o WAP	6.18	\$5,916,499	\$7,058,091	\$1,141,593

Kentucky Power (Winter) Results

The following table displays the results of the cost-benefit analysis for each program in the KPC portfolio with respect to the PCT test at Winter Peak. For this test, Weatherization Assistance Program (WAP) dollars apply.

Program	Ratio	NPV	PV Benefits	PV Costs
COCFL		\$734,082	\$734,082	\$0
EEFS		\$244,136	\$244,136	\$0
HEHP	2.21	\$962,272	\$1,759,397	\$797,126
MEF		\$1,274,458	\$1,274,458	\$0
MHHP	8.00	\$1,042,743	\$1,191,775	\$149,032
MHNC	3.66	\$519,667	\$715,102	\$195,435
TEE w/ WAP		\$1,884,981	\$1,884,981	\$0
TEE w/o WAP		\$1,139,141	\$1,139,141	\$0
Portfolio w/ WAP	6.84	\$6,662,339	\$7,803,931	\$1,141,593
Portfolio w/o WAP	6.18	\$5,916,499	\$7,058,092	\$1,141,593

References

The references listed below were used to help prepare the information contained within this plan. All are available upon request in electronic form.

- I. California Public Utilities Commission. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. April 2006.
 - II. State of California Governor's Office of Planning and Research. California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects. July 2002.
 - III. Mohr, Lawrence B. Impact Analysis For Program Evaluation. 2nd Ed. 1995
 - IV. Kentucky Power DSM Collaborative Report. January 1, 2008 to December 31, 2008.
 - V. Kentucky Power DSM Collaborative Report. January 1, 2009 to December 31, 2009.
 - VI. Kentucky Power DSM Collaborative Report. January 1, 2010 to December 31, 2010.
-
- VII. Claggett, Wade M. Kentucky Power Company Community Outreach CFL Program Evaluation 2009-2010. July, 2011.
 - VIII. Claggett, Wade M. Kentucky Power Company Energy Education for Students Program Evaluation 2009-2010. July, 2011.
 - IX. Claggett, Wade M. Kentucky Power Company High Efficiency Heat Pump Program Evaluation 2009-2010. July, 2011.
 - X. Claggett, Wade M. Kentucky Power Company Modified Energy Fitness Program Evaluation 2009-2010. July, 2011.
 - XI. Claggett, Wade M. Kentucky Power Company Mobile Home Heat Pump Program Evaluation 2009-2010. July, 2011.
 - XII. Claggett, Wade M. Kentucky Power Company Mobile Home New Construction Program Evaluation 2009-2010. July, 2011.
 - XIII. Claggett, Wade M. Kentucky Power Company Targeted Energy Efficiency Program Evaluation 2009-2010. July, 2011.

Appendix – EE/DR Analytics Team Members

The EE/DR Analytics team consists of members of various groups in the corporate office who collaborate using their Utility industry and DSM industry experiences to provide robust EM&V analyses.

Load Research

Wade M. Claggett

EE/DR Coordinator
614-947-9176 cell
614-716-3365 phone
614-716-1414 fax
wmclaggett@aep.com

Alan Graves

Supervisor Load Research
614-716-3316 phone
614-716-3388 fax
araraves@aep.com

Joseph Chambers

Contractor
614-716-3372 phone
614-716-3388 fax
jdchambers@aep.com

EE and Consumer Programs

Fred "Donny" Nichols

Manager Consumer Programs
540-798-8605 cell
614-716-4013 phone
614-716-1605 fax
fdnichols@aep.com

Kevin Vass

EE/DR Coordinator
614-271-1747 cell
614-716-1444 phone
614-716-1605 fax
kivass@aep.com

Marketing

David Tabata

Manager Marketing
540-579-2264 cell
614-716-4004 phone
614-716-1605 fax
dwtabata@aep.com

Paul Hrnicek

Marketing Analyst
614-716-2953 phone
614-716-1414 fax
pjhrnicek@aep.com

Brad Berson

Marketing Analyst
614-716-2445 phone
614-716-1605 fax
bsberson@aep.com

KENTUCKY POWER COMPANY		Exhibit C				
DERIVATION OF 3 SECTOR SURCHARGES FOR 3 YR EXPERIMENT						PAGE 1 of 19
RESIDENTIAL SECTOR		TOTAL YEARS 1 thru 15	YEAR 16 (2011) 1st HALF	YEAR 16 (2011) 3rd QTR	YEAR 16 (2011) 4th QTR	TOTAL
		(1)	(2)	(3)	(4)	(5)
1	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$14,413,742	\$1,175,415	\$979,451	\$985,916	\$17,554,524
2	CUMULATIVE (OVER)/UNDER COLLECTION	0	427,163	(488,221)	68,790	-
3	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	(41,824)	0	0	0	(41,824)
4	TOTAL TO BE RECOVERED	14,371,918	1,602,578	491,230	1,054,706	17,512,700
5	TOTAL AMOUNT RECOVERED	13,944,409	2,090,799	0	0	16,035,208
6	EXPECTED FUTURE RECOVERIES	0	0	422,440	561,601	984,041
7	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(9,833)	0	0	0	(9,833)
8	TRANSFER PORTION OF BALANCE FROM COMMERCIAL	9,487	0	0	0	9,487
9	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$427,163	(\$488,221)	\$68,790	\$493,105	\$493,105
10 AMOUNT TO BE RECOVERED					\$1,054,706	
11 ADJ. ESTIMATED SECTOR KWH - YEAR 16				545,788,500	636,014,500	
SURCHARGE RANGE (\$ PER KWH)						
12	FLOOR (CARRYOVER)	COL 5, L 2 / COL 5, L 11			0.000108	
13	MIDPOINT - proposed rate			0.000774	0.000883	
14	CEILING (TOTAL COST)	COL 5, L 4 / COL 5, L 11			0.001658	
COMMERCIAL SECTOR		TOTAL YEARS 1 thru 15	YEAR 16 (2011) 1st HALF	YEAR 16 (2011) 3rd QTR	YEAR 16 (2011) 4th QTR	TOTAL
		(1)	(2)	(3)	(4)	(5)
15	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$2,899,453	\$8,594	\$448,113	\$791,472	\$4,147,632
16	CUMULATIVE (OVER)/UNDER COLLECTION	0	(20,360)	(80,683)	160,434	0
17	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	1,520	0	0	0	1,520
18	TOTAL TO BE RECOVERED	2,900,973	(11,766)	367,430	951,906	4,148,152
19	TOTAL AMOUNT RECOVERED	2,908,568	68,917	0	0	2,977,485
20	EXPECTED FUTURE RECOVERIES	0	0	206,998	556,333	763,329
21	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(3,278)	0	0	0	(3,278)
22	TRANSFER BALANCE TO RESIDENTIAL	(9,487)	0	0	0	(9,487)
22	(OVER)/UNDER COLLECTION TO BE REFUNDED	(\$20,360)	(\$80,683)	\$160,434	\$395,573	\$395,573
23 AMOUNT TO BE RECOVERED					\$951,906	
24 ADJ. ESTIMATED SECTOR KWH - YEAR 16				370,960,800	361,020,800	
SURCHARGE RANGE (\$ PER KWH)						
25	FLOOR (CARRYOVER)				0.000444	
26	MIDPOINT - proposed rate			0.000558	0.001541	
27	CEILING (TOTAL COST)				0.002637	
INDUSTRIAL SECTOR		TOTAL YEARS 1 thru 15	YEAR 16 (2011) 1st HALF	YEAR 16 (2011) 3rd QTR	YEAR 16 (2011) 4th QTR	TOTAL
		(1)	(2)	(3)	(4)	(5)
28	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$79,026	\$0	\$0	\$0	\$79,026
29	CUMULATIVE (OVER)/UNDER COLLECTION	0	0	0	0	0
30	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	0	0	0	0	0
31	TOTAL TO BE RECOVERED	79,026	0	0	0	79,026
32	TOTAL AMOUNT RECOVERED	92,137	0	0	0	92,137
33	EXPECTED FUTURE RECOVERIES	0	0	0	0	0
34	TRANSFER BALANCE TO RESIDENTIAL & COMMERCIAL	13,111	0	0	0	13,111
35	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$0	\$0	\$0	\$0	\$0
36 AMOUNT TO BE RECOVERED					\$0	
37 ADJ. ESTIMATED SECTOR KWH - YEAR 16				770,250,600	834,463,000	
SURCHARGE RANGE (\$ PER KWH)						
38	FLOOR (CARRYOVER)				0.000000	
39	MIDPOINT			0.000000	0.000000	
40	CEILING (TOTAL COST) - proposed rate				0.000000	

1996													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM													Exhibit C Page 2 of 10
YEAR 1	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACT. PROGRAM COSTS	NET LOST REV/YR	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * REVENUES	EFFICIENCY INCENTIVE (EX. C, PG.18C)	MAXIMIZING INCENTIVE	TOTAL *	TOTAL EST. COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	COSTS (4) (1)(X)(3)	(KWH/PARTIC) (5)	(KWH/YR (6) (2)(X)(5)	(\$/KWH) (7)	(8) (X)(7)	(9)	(% OF COSTS) (10) (3)(X)(10)	INCENTIVE (11) (3)(X)(10)	(12) (4)(8)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	552	148	\$221.65	\$122,351	2,690	399,120	\$4.03	\$12,397	\$43,177		\$43,177	\$177,025	
Targeted Energy Efficiency - All Electric	223	101	\$1,026.88	\$228,894	5,570	552,570	\$4.03	\$17,913	\$0	\$11,450	\$11,450	\$257,957	
- Non-All Electric	74	35	\$372.19	\$27,542	690	23,800	\$4.03	\$744	\$719		\$719	\$29,005	
Compact Fluorescent Bulb	289	73	\$65.06	\$15,081	62	4,526	\$4.03	\$140	\$426		\$426	\$15,643	
High - Efficiency Heat Pump - Resistance Heat	539	216	\$73.49	\$39,611	2,275	491,409	\$4.03	\$15,292	\$10,634		\$10,634	\$65,537	
- Non Resistance Heat	527	206	\$51.31	\$32,310	813	167,478	\$4.03	\$5,216	\$6,755		\$6,755	\$46,321	
High - Efficiency Heat Pump - Mobile Home	358	159	\$498.95	\$176,814	2,169	341,280	\$4.03	\$10,617	\$13,834		\$13,834	\$201,365	
Mobile Home New Construction	70	22	\$292.66	\$20,488	0	0				\$1,024	\$1,024	\$21,512	
TOTAL RESIDENTIAL PROGRAMS	2,610	959		\$663,291		1,989,174		\$61,818	\$77,665	\$12,474	\$90,059	\$915,268	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	91	18	\$1,258.51	\$114,524	0	0	0		\$0	\$5,726	\$5,726	\$120,250	
- Class 2	5	1	\$1,875.40	\$9,377	0	0	0		\$0	\$469	\$469	\$9,848	
Smart Financing - Existing Building	1	0	\$5,794.00	\$5,794	22,000	0	\$0.04	\$0	\$0	\$509	\$509	\$6,300	
Smart Financing - New Building	0	0		\$0	30,600	0	\$0.04	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	97	20		\$129,695		0		\$0	\$506	\$6,195	\$6,701	\$135,396	
INDUSTRIAL PROGRAMS (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	15	1	\$149.40	\$2,241	0	0	0		\$0	\$112	\$112	\$2,353	
Smart Audit - Class 2	2	1	\$8,980.00	\$17,960	0	0	0		\$0	\$898	\$898	\$18,858	
Smart Financing - General	0	0		\$3,919	26,200	0	\$0.04	\$0	\$0	\$195	\$195	\$4,115	
Smart Financing - Compressed Air System	0	0		\$0	164,800	0	\$0.03	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	17	2		\$24,120		0		\$0	\$0	\$1,206	\$1,206	\$26,326	
TOTAL COMPANY	2,724	981		\$817,106		1,989,174		\$61,818	\$78,691	\$19,874	\$97,966	\$976,990	

* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.

1997	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REVENUE/MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/MOS (2)(X)(5) (6)	NET LOST REVENUE (6)(X)(7) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (CA-C, PG.10C) (9)	MAXIMIZING INCENTIVE (10) (4)(X)(5) (10)	TOTAL * INCENTIVE (11) (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)+(10)(11) (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 1997												
YEAR 2 (1st HALF)												
PROGRAM DESCRIPTIONS												
RESIDENTIAL PROGRAMS												
Energy Fitness	273	651	\$260.66	\$71,467	1,345	875,595	\$0.03	\$27,266	\$71,564	n/a	\$21,354	\$119,787
Lampless Energy Efficiency - All Electric	118	279	\$916.97	\$95,630	2,785	717,015	\$0.03	\$24,189	\$0	\$4,892	\$4,892	\$125,659
Non-All Electric	26	88	\$68.23	\$2,294	940	28,920	\$0.03	\$955	\$252	n/a	\$252	\$3,481
Compact Fluorescent Bulb	0	269		\$0	31	8,339	\$0.03	\$258	\$0	n/a	\$0	\$258
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	123	500	\$2.59	\$317	1,138	671,430	\$0.03	\$20,895	\$2,427	n/a	\$2,427	\$23,639
High - Efficiency Heat Pump - Mobile Home	124	624	\$2.56	\$316	407	236,457	\$0.03	\$7,364	\$2,070	n/a	\$2,070	\$9,752
Mobile Home New Construction	109	403	\$157.87	\$17,208	1,060	435,240	\$0.03	\$13,540	\$4,236	n/a	\$4,236	\$34,884
TOTAL RESIDENTIAL PROGRAMS	12	76	\$535.17	\$7,622	0	0	n/a	n/a	\$0	\$381	\$381	\$8,003
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	243	207	\$264.00	\$64,152	0	0	n/a	n/a	\$0	\$3,208	\$3,208	\$67,360
Smart Audit - Class 2	11	9	\$2,705.00	\$29,755	0	0	n/a	n/a	\$0	\$1,488	\$1,488	\$31,243
Smart Financing - Existing Building	0	0		\$5,029	11,000	11,000	\$0.04	\$469	\$0	\$281	\$281	\$5,379
Smart Financing - New Building	1	0	\$4,652.00	\$4,652	15,300	0	\$0.04	\$0	\$50	n/a	\$50	\$4,742
TOTAL COMMERCIAL PROGRAMS	255	217	\$104,228	\$104,228	0	11,000	\$0.04	\$469	\$50	\$4,977	\$5,027	\$109,724
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	9	20	\$279.56	\$2,516	0	0	n/a	n/a	\$0	\$126	\$126	\$2,642
Smart Audit - Class 2	1	2	\$1,133.00	\$1,133	0	0	n/a	n/a	\$0	\$57	\$57	\$1,190
Smart Financing - General	0	0		\$7,840	14,100	0	\$0.04	\$0	\$0	\$392	\$392	\$8,232
Smart Financing - Compressed Air System	0	0		\$0	82,400	0	\$0.03	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	10	22	\$11,489	\$11,489	0	0	n/a	\$0	\$0	\$575	\$575	\$12,064
TOTAL COMPANY	1,050	3,170	\$311,281	\$311,281	0	3,044,996	\$0.04	\$94,915	\$30,389	\$10,765	\$41,154	\$447,350

* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.

1997													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM													
													Exhibit C PAGE 38 of 19
YEAR 2 (3rd QTR)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACT. PROGRAM COSTS	NET LOST REV/QTR	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL *	TOTAL EST. COSTS TO BE	
	(1)	(2)	PER PARTICIPANT COSTS	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
			(3)	(1)(3)	(KWH/PARTIC.)	(KWH/QTR)	(\$/KWH)	REVENUES	PG. 18(C)	(5% of COSTS)	INCENTIVE	RECOVERED	
						(2)(5)		(6)(7)		(4)(5)	(9)(10)	(4)(8)(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	257	557	\$184.99	\$47,542	341	325,337	\$0.03	\$10,155	\$5,340	n/a	\$5,340	\$53,038	
Targeted Energy Efficiency - All Electric	51	369	\$1,090.08	\$55,594	1,392	513,640	\$0.03	\$15,980	\$0	\$2,760	\$2,760	\$74,354	
- Non-All Electric	15	108	\$193.33	\$2,900	170	18,360	\$0.03	\$574	\$25	n/a	\$25	\$3,499	
Compact Fluorescent Bulb	0	269	n/a	\$0	16	4,304	\$0.03	\$133	\$0	\$0	\$0	\$133	
High - Efficiency Heat Pump - Resistance Heat	109	717	\$55.05	\$5,000	547	392,199	\$0.03	\$12,213	\$787	n/a	\$787	\$19,000	
- Non Resistance Heat	84	655	\$55.18	\$5,559	221	163,595	\$0.03	\$4,785	\$2,445	n/a	\$2,445	\$12,700	
High - Efficiency Heat Pump - Mobile Home	77	509	\$659.62	\$53,101	625	318,125	\$0.03	\$9,694	\$2,503	n/a	\$2,503	\$55,498	
Mobile Home New Construction	0	82	n/a	\$3,032	0	0			\$0	\$305	\$305	\$6,397	
TOTAL RESIDENTIAL PROGRAMS	593	3,709		\$176,788		1,728,568		\$53,739	\$11,100	\$3,085	\$14,185	\$244,708	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	69	383	\$413.13	\$40,497	0	0			\$0	\$2,024	\$2,024	\$42,511	
- Class 2	5	19	\$2,705.00	\$13,525	0	0			\$0	\$875	\$875	\$14,201	
Smart Financing - Existing Building	2	2	\$3,067.00	\$6,134	11,100	22,200	\$0.04	\$840	\$1,627	n/a	\$1,627	\$5,701	
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$327	\$0	\$0	\$0	\$327	
TOTAL COMMERCIAL PROGRAMS	105	405		\$50,146		29,850		\$1,267	\$1,627	\$2,700	\$4,327	\$65,740	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	3	20	\$606.00	\$1,898	0	0			\$0	\$100	\$100	\$2,098	
Smart Audit - Class 2	0	3	n/a	\$0	0	0			\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	n/a	\$4,795	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$4,795	
Smart Financing - Compressed Air System	0	0	n/a	\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	3	23		\$6,793		0		\$0	\$0	\$100	\$100	\$6,893	
TOTAL COMPANY	701	4,140		\$243,717		1,758,418		\$55,003	\$12,727	\$5,885	\$18,612	\$317,332	

* Lost revenue and efficiency incentives are based on prospective values.

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
YEAR 2 (4th QTR)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/OTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/OTR (2)(X6) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (8) (5)(X7) (8)	EFFICIENCY INCENTIVE PG. 18C) (EX. C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X13%) (10)	TOTAL * INCENTIVE (11) (9)(10) (11)	TOTAL EST COSTS TO BE RECOVERED (12) (11)(8)(11) (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	432	1,267	\$259.53	\$112,115	341	438,667	\$0.03	\$13,658	\$8,677	n/a	\$8,677	\$134,750
Terminated Energy Efficiency - All Electric	124	443	\$924.15	\$114,595	1,393	617,089	\$0.03	\$19,198	\$0	\$57.30	\$5,730	\$139,523
- Non-All Electric	78	146	\$103.55	\$8,077	170	24,820	\$0.03	\$773	\$129	n/a	\$129	\$8,981
Compact Fluorescent Bulb	0	269	n/a	\$0	17	4,574	\$0.03	\$141	\$0	\$0	\$0	\$141
High - Efficiency Heat Pump - Resistance Heat	111	823	\$106.90	\$11,866	547	450,181	\$0.03	\$14,019	\$601	n/a	\$601	\$26,686
- Non Resistance Heat	102	782	\$142.21	\$14,505	221	172,822	\$0.03	\$5,385	\$2,969	n/a	\$2,969	\$22,859
High - Efficiency Heat Pump - Mobile Home	50	563	\$406.70	\$20,335	625	353,125	\$0.03	\$10,992	\$1,625	n/a	\$1,625	\$32,942
Mobile Home New Construction	0	82	n/a	\$749	0	0	0	0	0	(\$37)	(\$37)	\$7,661
TOTAL RESIDENTIAL PROGRAMS	887	4,397		\$280,744		2,061,487		\$64,198	\$14,501	\$5,693	\$20,194	\$365,096
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	71	473	\$230.82	\$16,395	0	0	0	0	\$0	\$820	\$820	\$17,215
- Class 2	21	93	\$7,705.00	\$95,605	0	0	0	0	\$0	\$2,840	\$2,840	\$59,645
Smart Financing - Existing Building	61	0	\$2,282.95	\$20,543	11,100	88,800	\$0.04	\$3,761	\$7,320	n/a	\$7,320	\$31,624
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$307	\$0	n/a	\$0	\$307
TOTAL COMMERCIAL PROGRAMS	101	515		\$37,443		95,450		\$4,068	\$7,320	\$3,660	\$10,980	\$108,611
INDUSTRIAL PROGRAMS												
Smart Audit - Class 1 (West. Opt-Opte Removed)	18	37	\$524.22	\$9,435	0	0	0	0	\$0	\$472	\$472	\$9,908
Smart Audit - Class 2	0	3	n/a	\$1,094	0	0	0	0	\$0	\$55	\$55	\$1,149
Smart Financing - General	0	0	n/a	\$11,802	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$1,802
Smart Financing - Compressed Air System	0	0	n/a	\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	18	40		\$22,332		0		\$0	\$0	\$527	\$527	\$22,860
TOTAL COMPANY	1,016	4,952		\$398,919		2,157,937		\$69,206	\$21,821	\$9,880	\$31,701	\$495,766

* Lost revenue and efficiency incentives are based on prospective values.

Exhibit C
PAGE 3C of 19

1998	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/S MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KW/HR MOS (2)(X)(5) (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (8) (5)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG. 18C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X)(5)(9)	TOTAL * INCENTIVE (11) (9)(X)(10)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)(X)(10)(11)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 3(1st HALF)												
PROGRAM DESCRIPTIONS												
RESIDENTIAL PROGRAMS												
Energy Fitness	544	1,768	\$184.44	\$100,354	682	1,205,776	\$0.03	\$7,524	\$11,304	n/a	\$11,304	\$148,162
Targeted Energy Efficiency - All Electric	122	555	\$1,132.92	\$138,216	2,784	1,572,950	\$0.03	\$48,955	\$0	\$6,911	\$6,911	\$194,052
Non-All Electric	24	203	\$112.92	\$2,710	340	98,020	\$0.03	\$2,156	\$40	n/a	\$40	\$4,906
Compact Fluorescent Bulb	0	269	\$0.00	\$0	32	8,608	\$0.03	\$266	\$0	\$0	\$0	\$266
High - Efficiency Heat Pump - Resistance Heat	21	887	\$70.10	\$1,472	1,094	970,378	\$0.03	\$30,218	\$152	n/a	\$152	\$31,842
Non Resistance Heat	26	948	\$70.00	\$1,820	442	\$74,816	\$0.03	\$11,679	\$757	n/a	\$757	\$14,256
High - Efficiency Heat Pump - Mobile Home	06	616	\$535.30	\$535,330	1,250	770,000	\$0.03	\$23,947	\$2,145	n/a	\$2,145	\$61,422
Mobile Home New Construction	0	82	n/a	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	803	5,238		\$279,882		4,971,558		\$154,725	\$14,308	\$6,911	\$21,309	\$455,916
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	204	597	\$194.13	\$38,502	0	0	n/a	\$0	\$0	\$1,980	\$1,980	\$11,582
Class 2	28	60	\$1,800.00	\$44,800	0	0	n/a	\$0	\$0	\$2,240	\$2,240	\$47,040
Smart Financing - Existing Building	8	16	\$5,981.50	\$44,652	22,200	355,200	\$0.04	\$15,043	\$6,508	n/a	\$6,508	\$65,201
Smart Financing - New Building	1	1	\$4,564.00	\$4,564	15,300	15,300	\$0.04	\$654	\$29	\$0	\$29	\$5,247
TOTAL COMMERCIAL PROGRAMS	241	674		\$133,618		\$70,500		\$15,697	\$6,535	\$4,220	\$10,755	\$160,070
INDUSTRIAL PROGRAMS (W/Est. Opt-Outs Removed)												
Smart Audit - Class 1	12	51	\$246.08	\$2,953	0	0	n/a	\$0	\$0	\$148	\$148	\$3,101
Smart Audit - Class 2	1	3	\$1,800.00	\$1,800	0	0	n/a	\$0	\$0	\$90	\$90	\$1,890
Smart Financing - General	0	0	\$0.00	\$1,338	29,250	0	\$0.04	\$0	\$0	\$67	\$67	\$1,405
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	13	54		\$6,091		0		\$0	\$0	\$305	\$305	\$6,396
TOTAL COMPANY	1,057	5,966		\$419,591		5,242,058		\$170,422	\$20,933	\$11,436	\$32,369	\$622,382

* Lost revenue and efficiency incentives are based on prospective values.

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											Exhibit C PAGE 4B of 10	
YEAR (1 2nd HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACT. PROGRAM COSTS	NET LOST REVR# MOS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOST	EFFICIENCY INCENTIVE (EX C, PG.18C)	MAXIMIZING INCENTIVE (% OF COSTS)	TOTAL * INCENTIVE	TOTAL EST. COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (1)(X3)	(4)	(KWH/PARTIC) (5)	KWH# MOS (2)(X5) (6)	(\$/KWH) (7)	(6)(X7) (8)	(9)	(10)	(11)	(12)
RESIDENTIAL PROGRAMS												
Energy Fitness	408	2,277	\$301.30	\$134,082	682	1,652,614	\$0.03	\$49,327	\$9,309	\$0	\$9,309	\$192,618
Targeted Energy Efficiency - All Electric	131	697	\$1,107.51	\$155,924	2,784	1,940,448	\$0.03	\$60,367	\$0	\$0	\$7,778	\$223,709
- Non-All Electric	42	238	\$139.62	\$5,954	348	60,920	\$0.03	\$2,528	\$70	\$0	\$70	\$8,482
Compact Fluorescent Bulb	0	269	\$0.00	\$0	32	8,608	\$0.03	\$269	\$0	\$0	\$0	\$269
High - Efficiency Heat Pump - Resistance Heat	109	940	\$147.45	\$15,925	1,094	1,028,360	\$0.03	\$37,023	\$760	\$0	\$760	\$48,728
- Non Resistance Heat	64	854	\$72.27	\$4,625	442	365,148	\$0.03	\$12,913	\$1,853	\$0	\$1,853	\$18,801
High - Efficiency Heat Pump - Mobile Home	173	764	\$514.50	\$89,009	1,250	955,000	\$0.03	\$29,701	\$5,623	\$0	\$5,623	\$124,333
Mobile Home New Construction	33	11	\$549.45	\$16,132	0	0	0	\$0	\$907	\$907	\$0	\$19,039
TOTAL RESIDENTIAL PROGRAMS	959	6,950	\$424,101	\$358,138	6,700	5,581,308	\$0.03	\$185,525	\$17,645	\$6,685	\$26,330	\$535,956
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	178	785	\$534.85	\$85,203	0	0	0	\$0	\$0	\$4,760	\$4,760	\$69,903
- Class 2	5	73	\$2,800.00	\$25,200	0	0	0	\$0	\$0	\$1,260	\$1,260	\$26,460
Smart Financing - Existing Building	29	32	\$1,878.86	\$54,487	22,200	710,400	\$0.04	\$30,085	\$23,589	\$0	\$23,589	\$108,157
Smart Financing - New Building	5	6	\$1,929.20	\$7,646	15,300	91,800	\$0.04	\$3,026	\$144	\$0	\$144	\$11,716
TOTAL COMMERCIAL PROGRAMS	221	906	\$182,539	\$122,539	22,200	802,200	\$0.04	\$34,011	\$23,729	\$6,020	\$29,749	\$246,206
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	3	59	\$852.33	\$2,557	0	0	0	\$0	\$0	\$128	\$128	\$2,685
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	1	0	\$0.00	\$2,430	29,250	0	\$0.04	\$0	\$383	\$0	\$383	\$2,813
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	4	63	\$4,987	\$4,987	29,250	0	\$0.04	\$0	\$383	\$128	\$511	\$5,498
TOTAL COMPANY	1,224	7,059	\$911,624	\$611,624	6,700	6,703,598	\$0.03	\$219,536	\$41,757	\$14,833	\$56,590	\$887,760

* Lost revenue and efficiency incentives are based on prospective values.

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. COSTS (1)(X)(3)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (2)(X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (9)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG.16C) (9)	MAXIMIZING INCENTIVE (6% of COSTS) (4)(X)(5%)(10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (4)+(8)+(11)(12)
RESIDENTIAL PROGRAMS												
Energy Fitness	306	2,664	\$212.58	\$65,650	707	1,904,656	\$0.03	\$59,273	\$10,370	\$0	\$10,370	\$165,203
Targeled Energy Efficiency - All Electric	76	773	\$1,907.41	\$143,056	630	486,990	\$0.03	\$15,150	\$0	\$7,153	\$17,153	\$165,359
- Non-All Electric	12	249	\$112.00	\$1,344	306	76,194	\$0.03	\$2,380	\$0	\$0	\$0	\$3,764
Compact Fluorescent Bulb	0	266	\$0.00	\$0	31	8,339	\$0.03	\$256	\$0	\$0	\$0	\$256
High - Efficiency Heat Pump - Resistance Heat	90	1,002	\$273.74	\$27,100	1,200	1,202,400	\$0.03	\$37,443	\$4,375	\$0	\$4,375	\$69,918
- Non Resistance Heat	2	653	\$50.00	\$100	442	377,026	\$0.03	\$11,746	\$0	\$5	\$5	\$11,853
High - Efficiency Heat Pump - Mobile Home	101	826	\$945.99	\$95,145	1,475	1,216,350	\$0.03	\$37,891	\$8,505	\$0	\$8,505	\$101,541
Mobile Home New Construction ***	98	45	\$87.20	\$57,646	1,756	79,020	\$0.03	\$2,458	\$4,353	\$0	\$4,353	\$64,357
TOTAL RESIDENTIAL PROGRAMS	693	6,711		\$379,941		5,352,977		\$166,001	\$27,663	\$7,158	\$34,821	\$581,363
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	186	964	\$204.71	\$38,076	0	0	n/a	0	\$0	\$1,904	\$1,904	\$39,980
- Class 2	16	87	\$2,705.00	\$43,260	0	0	n/a	0	\$0	\$2,164	\$2,164	\$45,444
Smart Financing - Existing Building	6	51	\$5,095.67	\$30,650	13,292	677,362	\$0.04	\$28,687	\$1,395	\$0	\$1,395	\$60,740
Smart Financing - New Building	3	9	\$0.00	\$2,550	14,101	126,909	\$0.04	\$5,426	\$787	\$0	\$787	\$9,565
TOTAL COMMERCIAL PROGRAMS	211	1,111		\$114,364		804,291		\$34,115	\$2,182	\$4,088	\$6,250	\$164,729
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	60	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	65		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	904	7,920		\$494,305		6,215,216		\$200,716	\$29,845	\$11,226	\$41,071	\$746,092

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/96.
 *** Participants since 09/01/96.

Exhibit C
PAGE 5A of 19

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (2nd HALF)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES LOST (8)	EFFICIENCY INCENTIVE (EX. C. PG.18C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)-(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)-(9)+(11) (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,519	\$0.00	\$972	707	1,780,933	\$0.03	\$55,423	\$0	\$0	\$0	\$55,365
Lampless Energy Efficiency - All Electric	66	700	\$1,222.76	\$80,702	630	441,000	\$0.03	\$13,730	\$0	\$4,095	\$4,095	\$98,457
- Non-All Electric	8	220	\$67.50	\$540	305	67,320	\$0.03	\$2,103	\$40	\$0	\$40	\$2,683
Compact Fluorescent Bulb	0	123	\$0.00	\$0	31	3,813	\$0.03	\$116	\$0	\$0	\$0	\$116
High - Efficiency Heat Pump - Resistance Heat	140	810	\$211.14	\$29,560	1,200	972,000	\$0.03	\$30,288	\$5,187	\$0	\$5,187	\$35,015
- Non Resistance Heat	0	593	\$0.00	\$0	447	283,071	\$0.03	\$9,280	\$0	\$0	\$0	\$9,280
High - Efficiency Heat Pump - Mobile Home	134	739	\$539.07	\$72,235	1,475	1,090,025	\$0.03	\$33,900	\$11,284	\$0	\$11,284	\$117,420
Mobile Home New Construction **	123	195	\$581.42	\$71,515	1,755	343,980	\$0.03	\$10,680	\$5,464	\$0	\$5,464	\$67,677
TOTAL RESIDENTIAL PROGRAMS	471	5,000		\$255,525		4,954,142		\$154,490	\$22,975	\$4,035	\$27,010	\$437,025
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	188	1,129	\$356.11	\$66,948	0	0	n/a	\$0	\$0	\$3,347	\$3,347	\$70,595
- Class 2	21	103	\$2,705.00	\$56,805	0	0	n/a	\$0	\$0	\$2,840	\$2,840	\$59,645
Smart Financing - Existing Building	25	66	\$2,726.04	\$68,151	13,282	676,512	\$0.04	\$37,125	\$5,874	\$0	\$5,874	\$111,090
Smart Financing - New Building	8	13	\$3,087.00	\$24,696	14,101	183,313	\$0.04	\$7,840	\$2,099	\$0	\$2,099	\$34,635
TOTAL COMMERCIAL PROGRAMS	242	1,311		\$216,600		1,859,825		\$44,965	\$7,973	\$5,187	\$14,100	\$275,665
INDUSTRIAL PROGRAMS * (W/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	57	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	62		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	713	7,273		\$472,125		6,024,067		\$199,455	\$30,688	\$10,222	\$41,110	\$712,690

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/09.
 *** Participants since 09/01/09.

Exhibit C
 PAGE 58 of 19

Year 2000												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 3 (1st half)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (1)(X)(3)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF (2)(X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOSSES (6)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG. 18C) (8)	MAXIMIZING INCENTIVE (5% of COSTS) (10)(4)(X)(5%)	TOTAL * INCENTIVE (11)(9)(+)(10)	TOTAL EST. COSTS TO BE RECOVERED (12)(4)(+)(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,151	\$0.00	\$0	707	1,527,827	\$0.03	\$47,546	\$0	\$0	\$0	\$47,546
Targeted Energy Efficiency - All Electric	661	659	\$1,272.61	\$83,592	530	415,170	\$7.03	\$12,916	\$0	\$4,200	\$4,200	\$101,108
- Non-All Electric	26	202	\$50.82	\$2,543	365	61,612	\$1.03	\$1,931	\$141	\$0	\$141	\$4,615
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	36	663	\$200.00	\$7,260	1,200	619,500	\$0.03	\$25,522	\$1,679	\$0	\$1,679	\$34,501
- Non Resistance Heat	0	346	\$0.00	\$0	447	155,556	\$0.03	\$4,947	\$0	\$0	\$0	\$4,947
High - Efficiency Heat Pump - Mobile Home	45	663	\$500.00	\$22,500	1,475	1,007,425	\$4.03	\$31,331	\$3,789	\$0	\$3,789	\$57,620
Mobile Home New Construction ***	101	302	\$530.20	\$53,550	1,755	530,010	\$4.03	\$16,483	\$4,483	\$0	\$4,483	\$74,519
TOTAL RESIDENTIAL PROGRAMS	276	5,098		\$170,165		4,517,400		\$140,576	\$10,095	\$4,200	\$14,295	\$325,056
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	144	1,126	\$397.19	\$57,195	0	0	n/a	\$0	\$0	\$2,060	\$2,060	\$60,055
- Class 2	6	112	\$2,705.00	\$16,230	0	0	n/a	\$0	\$0	\$1,062	\$1,062	\$27,722
Smart Financing - Existing Building	16	86	\$1,307.31	\$20,917	13,282	1,142,252	\$6.04	\$48,374	\$3,721	\$0	\$3,721	\$73,072
Smart Financing - New Building	4	20	\$6,286.75	\$25,145	14,101	282,026	\$6.04	\$12,082	\$1,049	\$0	\$1,049	\$38,306
TOTAL COMMERCIAL PROGRAMS	172	1,344		\$124,947		1,424,272		\$60,436	\$4,770	\$3,942	\$8,712	\$194,095
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	450	6,392		\$295,132		5,941,672		\$201,012	\$14,865	\$8,142	\$23,007	\$519,151

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/97
 *** Participants since 09/01/98

Exhibit C
 PAGE 6A of 19

Year 2000												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
											Exhibit C PAGE 68 of 19	
YEAR 5 (2nd half)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACT. PROGRAM COSTS	NET LOST REV/HALF	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL **	TOTAL EST. COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT COSTS (3)	(4) (1)X(3)	(5) (KWH/PARTIC)	(6) (KWH/HALF)	(7) (\$/KWH)	(8) (5)X(7)	(9) (EX C, PG.16C)	(10) (% of COSTS) (4)X(9)	(11) (9)+(10)	(12) (4)+(8)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	1,525	\$0.00	\$0	709	1,076,650	\$0.03	\$33,605	\$0	\$0	\$0	\$33,605
Targeted Energy Efficiency - All Electric	99	583	\$1,115.41	\$110,426	630	357,290	\$0.03	\$11,426	\$0	\$5,521	\$5,521	\$127,973
- Non-All Electric	21	170	\$94.67	\$1,988	306	52,020	\$0.03	\$1,625	\$105	\$0	\$105	\$3,718
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	25	481	\$200.00	\$5,000	1,209	577,209	\$0.03	\$17,974	\$1,105	\$0	\$1,105	\$24,079
- Non Resistance Heat	0	147	\$0.00	\$0	446	65,952	\$0.03	\$2,043	\$0	\$0	\$0	\$2,043
High - Efficiency Heat Pump - Mobile Home	43	572	\$495.35	\$21,300	1,476	844,272	\$0.03	\$25,257	\$3,621	\$0	\$3,621	\$81,178
Mobile Home New Construction ***	94	403	\$575.00	\$54,050	1,755	707,265	\$0.03	\$21,958	\$4,175	\$0	\$4,175	\$80,221
TOTAL RESIDENTIAL PROGRAMS	282	3,891		\$182,764		3,690,259		\$114,826	\$9,008	\$5,521	\$14,527	\$322,117
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	159	1,028	\$165.24	\$86,273	0	0	n/a	\$0	\$0	\$1,314	\$1,314	\$27,587
- Class 2	29	98	\$2,705.00	\$78,445	0	0	n/a	\$0	\$0	\$3,922	\$3,922	\$82,367
Smart Financing - Existing Building	24	97	\$914.54	\$21,848	13,293	1,288,354	\$0.04	\$54,562	\$5,581	\$0	\$5,581	\$82,092
Smart Financing - New Building	0	21	\$0.00	\$7,269	14,102	298,142	\$0.04	\$12,656	\$0	\$0	\$0	\$19,935
TOTAL COMMERCIAL PROGRAMS	212	1,242		\$133,936		1,584,456		\$67,220	\$5,581	\$5,238	\$10,817	\$211,931
INDUSTRIAL PROGRAMS (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	0	\$0	0	0
TOTAL COMPANY	494	5,123		\$326,700		5,274,755		\$182,054	\$14,587	\$10,757	\$25,344	\$534,008

* Lost revenue and efficiency incentives are based on respective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/97
 *** Participants since 09/01/99

Year 2011												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												Exhibit C PAGE 7A of 19
YEAR 6 (1st Half)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACT PROGRAM COSTS	NET LOST REV/DTR	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOST	EFFICIENCY INCENTIVE (EX. C. PG 18C)	MAXIMIZING INCENTIVE	TOTAL *	TOTAL EST. COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT (3)	(4) COSTS (1)(3)	(5) (KWH/PARTIC)	(6) KWH/HALF (2)(6)	(7) (\$/KWH)	(8) REVENUES (9)(7)	(9) (10)	(10) (% of COSTS)	(11) INCENTIVE (9)+(10)	(12) RECOVERED (4)+(8)-(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	1,044	\$0.00	\$0	767	736,106	\$0.03172	\$22,670	\$0	\$0	\$0	\$22,670
Enclosed Energy Efficiency - All Electric	82	535	\$1,278.04	\$78,170	630	337,650	\$0.03111	\$10,496	\$0	\$5,059	\$3,959	\$83,615
Enclosed Energy Efficiency - Non-All Electric	18	137	\$67.69	\$1,692	366	41,622	\$0.03134	\$1,310	\$90	\$0	\$90	\$2,062
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	23	438	\$201.04	\$4,624	1260	625,600	\$0.03114	\$16,387	\$1,016	\$0	\$1,016	\$22,007
High - Efficiency Heat Pump - Non Resistance Heat	0	81	\$0.00	\$0	447	36,207	\$0.03118	\$1,128	\$0	\$0	\$0	\$1,128
High - Efficiency Heat Pump - Mobile Home	53	658	\$472.15	\$25,024	1475	823,050	\$0.03110	\$25,597	\$4,483	\$0	\$4,483	\$55,084
Mobile Home New Construction ***	83	488	\$537.64	\$44,674	1755	856,440	\$0.03110	\$26,635	\$3,687	\$0	\$3,687	\$74,666
TOTAL RESIDENTIAL PROGRAMS	239	3,261		\$154,974		3,358,377		\$104,483	\$9,250	\$3,959	\$13,215	\$272,682
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	134	1,017	\$321.82	\$43,124	0	0	N/A	\$0	\$0	\$2,159	\$2,159	\$45,280
Smart Audit - Class 2	28	105	\$1,510.00	\$42,280	0	0	N/A	\$0	\$0	\$2,114	\$2,114	\$44,994
Smart Financing - Existing Building	151	112	\$2,309.00	\$34,635	13,282	1,487,564	\$0.04435	\$62,599	\$3,488	\$0	\$3,488	\$101,122
Smart Financing - New Building	8	25	\$4,018.13	\$32,129	14,101	352,625	\$0.04477	\$15,077	\$2,099	\$0	\$2,099	\$46,305
TOTAL COMMERCIAL PROGRAMS	181	1,259		\$152,168		1,840,189		\$78,676	\$5,567	\$4,270	\$9,657	\$240,161
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	424	4,540		\$307,142		5,198,466		\$182,559	\$14,843	\$8,229	\$23,072	\$512,783

* Lost revenues and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/09
 *** Participants since 01/01/08

Year 2001												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3-YEAR PROGRAM											Exhibit C PAGE 79 of 110	
YEAR 0 (2nd Half)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACT. PROGRAM	NET LOST REVOLTR	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL *	TOTAL EST. COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT (3)	COSTS (4) (1)(X)(3)	(KWH/PARTIC) (5)	(KWH/HALF (6) (2)(X)(5)	(\$/KWH) (7)	REVENUES (8) (6)(X)(7)	(EX. C. PG.18C) (9)	(% of COSTS) (10) (4)(X)(5)	INCENTIVE (11) (9)+(10)	(12) (4)-(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	535	\$0.00	\$0	709	377,710	\$0.0112	\$11,754	\$0	\$0	\$0	\$11,754
Targeted Energy Efficiency - All Electric	68	485	\$1,018.66	\$69,660	830	306,180	\$0.0111	\$9,525	\$0	\$4,483	\$4,483	\$103,600
- Non-All Electric	49	122	\$81.48	\$3,747	306	37,332	\$0.0124	\$1,166	\$231	\$0	\$231	\$5,144
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	30	412	\$173.33	\$5,200	1,200	494,400	\$0.0114	\$15,399	\$1,329	\$0	\$1,329	\$21,922
- Non Resistance Heat	0	35	\$0.00	\$0	449	15,610	\$0.0116	\$486	\$0	\$0	\$0	\$486
High - Efficiency Heat Pump - Mobile Home	47	469	\$510.64	\$24,000	1,479	682,244	\$0.0110	\$21,829	\$3,958	\$0	\$3,958	\$49,467
Mobile Home New Construction ***	92	569	\$558.43	\$51,100	1,759	696,840	\$0.0110	\$21,802	\$4,087	\$0	\$4,087	\$89,189
TOTAL RESIDENTIAL PROGRAMS	303	2,627		\$173,707		2,920,316		\$90,859	\$9,802	\$4,483	\$14,065	\$278,650
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	131	966	\$454.04	\$59,479	0	0	N/A	\$0	\$0	\$2,074	\$2,074	\$52,453
Class 2	5	111	\$9,617.20	\$49,086	0	0	N/A	\$0	\$0	\$2,454	\$2,454	\$51,540
Smart Financing - Existing Building	15	109	\$1,984.27	\$24,964	13,262	1,447,738	\$0.0225	\$81,312	\$3,488	\$0	\$3,488	\$99,764
Smart Financing - New Building	18	34	\$1,769.28	\$32,387	14,102	479,499	\$0.0277	\$20,507	\$4,722	\$0	\$4,722	\$57,818
TOTAL COMMERCIAL PROGRAMS	169	1,220		\$165,916		1,927,206		\$81,819	\$8,210	\$5,428	\$13,638	\$281,373
INDUSTRIAL PROGRAMS - (W&E Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	472	3,847		\$339,623		4,847,522		\$172,677	\$17,812	\$9,911	\$27,723	\$540,023

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/08
 *** Participants since 07/01/09

Year 2002												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											Exhibit C	
											PAGE 8A of 19	
YEAR 7 (1st Half)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/HALF	TOTAL ENERGY SAVINGS (KWH/HALF)	NET LDST (\$/KWH)	TOTAL NET * REVENUES	EFFICIENCY (EX. C, PG.18C)	MAXIMIZING INCENTIVE (5% of COSTS)	TOTAL * INCENTIVE	TOTAL ACTUAL COSTS TO BE
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			(1)(3)			(2)(6)		(8)(7)		(4)(5)	(9)+(10)	(4)+(8)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	116	\$0.00	\$0	707	82,012	\$0.03112	\$2,552	\$0	\$0	\$0	\$2,552
Targeted Energy Efficiency - All Electric	63	442	\$1,752.40	\$110,401	1,028	454,376	\$0.03111	\$14,136	\$0	\$5,520	\$5,520	\$130,057
- Non-All Electric	32	135	\$65.47	\$2,095	315	42,525	\$0.03124	\$1,328	\$137	\$0	\$137	\$3,560
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	1	314	\$1,152.00	\$1,152	1,200	376,800	\$0.03114	\$11,734	\$44	\$0	\$44	\$12,930
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Mobile Home	43	414	\$619.77	\$26,650	1,144	473,516	\$0.03110	\$14,729	\$1,244	\$0	\$1,244	\$42,623
Mobile Home New Construction ***	57	568	\$641.77	\$36,581	1,809	1,027,512	\$0.03110	\$31,956	\$231	\$0	\$231	\$68,768
TOTAL RESIDENTIAL PROGRAMS	196	1,989		\$176,879		2,456,841		\$76,435	\$1,650	\$5,520	\$7,176	\$260,460
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	125	923	\$432.82	\$54,115	0	0	n/a	\$0	\$0	\$2,706	\$2,706	\$56,821
- Class 2	8	104	\$3,711.00	\$29,688	0	0	n/a	\$0	\$0	\$1,484	\$1,484	\$31,172
Smart Financing - Existing Building	7	101	\$2,552.71	\$17,869	13,282	1,341,482	\$0.04235	\$56,812	\$1,628	\$0	\$1,628	\$76,309
Smart Financing - New Building	5	42	\$1,394.60	\$6,973	14,101	592,242	\$0.04277	\$25,330	\$1,312	\$0	\$1,312	\$33,615
TOTAL COMMERCIAL PROGRAMS	145	1,170		\$108,645		1,933,724		\$82,142	\$2,940	\$4,190	\$7,130	\$197,917
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	341	3,159		\$285,524		4,390,565		\$158,577	\$4,596	\$9,710	\$14,306	\$458,407

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/1999.
 *** Participants since 01/01/1999.

Year 2002												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											Exhibit C	
											PAGE 09 of 19	
YEAR 7 (2nd Half)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/QTR	TOTAL ENERGY SAVINGS (KWH/HALF)	NET LOST REVENUE (\$/K/MH)	TOTAL NET * REVENUES (PG.18C)	EFFICIENCY INCENTIVE (EX. C. PG.18C)	MAXIMIZING INCENTIVE (5% of COSTS)	TOTAL * INCENTIVE (9)*(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (4)+(8)+(11)
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	COSTS (3)	(4)	(KWH/PARTIC) (5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			(1)*(3)			(2)*(6)		(3)*(7)	(4)*(9)		(9)*(10)	(4)+(8)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.0112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency - All Electric	76	457	\$1,039.33	\$70,809	1,028	489,798	\$0.0111	\$14,615	\$0	\$3,949	\$3,949	\$97,653
- Non-All Electric	13	156	\$85.92	\$1,117	315	49,140	\$0.0124	\$1,535	\$56	\$0	\$56	\$2,708
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	0	177	\$0.00	(\$352)	1,200	212,400	\$0.0114	\$6,614	\$0	\$0	\$0	\$6,262
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.0116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Mobile Home	43	300	\$603.84	\$25,065	1,144	352,352	\$0.0110	\$10,958	\$1,244	\$0	\$1,244	\$38,167
Mobile Home New Construction ***	61	519	\$644.46	\$39,312	1,600	938,871	\$0.0110	\$29,199	\$248	\$0	\$248	\$69,758
TOTAL RESIDENTIAL PROGRAMS	193	1,617	\$145,031	\$20,222	3,365	2,022,659	\$0.0110	\$62,921	\$1,548	\$3,949	\$5,497	\$213,449
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	788	\$0.00	\$74,422	0	0	n/a	\$0	\$0	\$3,721	\$3,721	\$79,143
- Class 2	0	60	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	25	97	\$939.76	\$22,744	13,282	1,288,354	\$0.0235	\$54,562	\$5,814	\$0	\$5,814	\$93,120
Smart Financing - New Building	16	44	\$2,424.54	\$39,799	14,102	620,458	\$0.0427	\$29,539	\$4,197	\$0	\$4,197	\$69,534
TOTAL COMMERCIAL PROGRAMS	41	1,017	\$135,965	\$20,222	1,008	1,908,842	\$0.0110	\$81,100	\$10,011	\$3,721	\$13,732	\$230,797
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	234	2,634	\$280,996	\$20,222	3,365	3,931,401	\$0.0110	\$144,021	\$11,559	\$7,670	\$10,229	\$444,246

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/1999.
 *** Participants since 07/01/1999.

Year 2003													10
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													Exhibit C PAGE 9A.01
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	PER PARTICIPANT COSTS (3)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVENUE (KWH/ HALF REV/HALF (5))	TOTAL ENERGY SAVINGS (KWH/ HALF (6))	NET LOST REVENUE (\$/KWH/ HALF (7))	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG. 18C) (9)	MAXIMIZING INCENTIVE (4)X(5%) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0312	\$0	\$0	\$0	\$0	\$0
Energy Fitness	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0312	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	100	467	\$849.84	\$8.4984	\$84,984	1,028	480,076	\$0.0311	\$14,955	\$0	\$4,249	\$4,249	\$104,168
- All Electric	7	151	\$79.29	\$11.327	\$555	314	47,414	\$0.0316	\$1,461	\$0	\$0	\$0	\$2,066
- Non-All Electric	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0314	\$3,513	\$0	\$0	\$0	\$3,513
- Resistance Heat	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0316	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0316	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0310	\$0,535	\$0	\$0	\$0	\$0,535
- Mobile Home	34	268	\$379.41	\$11.159	\$12,800	1,144	305,592	\$0.0310	\$0,535	\$0	\$0	\$0	\$23,416
Mobile Home New Construction ***	0	0	\$0.00	\$0.00	\$0	0	0	\$0.0310	\$0	\$0	\$0	\$0	\$0
- Heat Pump	45	450	\$402.61	\$8.949	\$22,200	1,808	831,680	\$0.0310	\$25,865	\$187	\$0	\$187	\$48,252
- Air Conditioner	0	0	\$0.00	\$0.00	\$0	157	0	\$0.0324	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	101	23	\$142.72	\$1.413	\$14,415	1,194	27,482	\$0.0316	\$656	\$2,127	\$0	\$2,127	\$17,398
TOTAL RESIDENTIAL PROGRAMS	268	1,483	\$135,054	\$503.93	\$1,806,024	1,808	4,867,024	\$0.0316	\$56,165	\$3,327	\$4,249	\$7,576	\$198,815
COMMERCIAL PROGRAMS	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
(W/Est. Opt-Outs Removed)	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	268	2,315	\$135,054	\$503.93	\$1,806,024	3,957	5,867,024	\$0.0316	\$56,165	\$3,327	\$4,249	\$7,576	\$200,241

* Least revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 09/30/2000.
 *** Participants since 01/01/2000.

Year 2003													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 8 (2nd HALF)													9B of
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET REVENUE (S/KWH) (7)	TOTAL NET * LOSS (8)	EFFICIENCY INCENTIVE (EX. C. PG.18C) (9)	MAXIMIZING INCENTIVE (10)	TOTAL * INCENTIVE (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
			PER PARTICIPANT (3)	(1)(X)(3)	(KWH/ PARTICIPANT) (5)	(KWH/HALF) (6)	(S/KWH) (7)	(6)(X)(7)	(% of COSTS) (10)	(9)+(10)	(4)+(8)+(11)		
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Energy Fitness													
Targeted Energy Efficiency - All Electric	69	473	\$974.94	\$67,271	1,026	483,244	\$0.03111	\$18,127	\$0	\$3,364	\$3,364	\$65,762	
- Non-All Electric	69	167	\$76.10	\$5,251	316	52,772	\$0.03124	\$1,649	\$295	\$0	\$295	\$7,195	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump - Resistance Heat	0	63	\$0.00	\$0	1,200	75,600	\$0.03114	\$2,354	\$0	\$0	\$0	\$2,354	
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump - InMobile Home	29	256	\$453.45	\$13,150	1,144	292,864	\$0.03110	\$0,108	\$639	\$0	\$639	\$23,087	
Mobile Home New Construction ***													
- Heat Pump	64	419	\$949.59	\$41,574	1,810	736,350	\$0.03110	\$23,586	\$0	\$260	\$260	\$66,420	
- Air Conditioner	1	0	\$150.00	\$150	158	0	\$0.03124	\$0	\$0	\$0	\$0	\$150	
Modified Energy Fitness	441	324	\$431.43	\$190,262	1,194	386,656	\$0.03116	\$12,054	\$9,287	\$0	\$9,287	\$211,603	
TOTAL RESIDENTIAL PROGRAMS	673	1,702		\$317,658		2,052,726		\$63,078	\$10,661	\$3,364	\$14,045	\$395,581	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	463	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	63	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	77	\$0.00	\$0	13,282	1,022,714	\$0.04235	\$43,312	\$0	\$0	\$0	\$43,312	
Smart Financing - New Building	0	47	\$0.00	\$0	14,102	662,794	\$0.04277	\$28,348	\$0	\$0	\$0	\$28,348	
TOTAL COMMERCIAL PROGRAMS	0	640		\$0		1,665,508		\$71,660	\$0	\$0	\$0	\$71,660	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	673	2,342		\$317,658		3,738,234		\$135,638	\$10,661	\$3,364	\$14,045	\$467,241	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 1/23/2000.
 *** Participants since 07/01/2000.

Year 2004													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											Exhibit C		
											PAGE 10A of 19		
YEAR 9 (1st HALF)	NEW	CUMULATIVE	TOTAL	TOTAL	NET LOST	TOTAL	NET	TOTAL	EFFICIENCY	MAXIMIZING	TOTAL	TOTAL	
	PARTICIPANT	PARTICIPANT	ESTIMATED	ACTUAL	REV/QTR	ENERGY	LOST	NET *	INCENTIVE	INCENTIVE	INCENTIVE	COSTS TO BE	
PROGRAM DESCRIPTIONS	NUMBER	NUMBER **	PER	COSTS	(KWH/PARTIC)	KWH	HALF	(\$/KWH)	REVENUES	(EX. C.	(5% of	RECOVERED	
	(1)	(2)	PARTICIPANT	(4)	(5)	HALF	(2)(X)(5)	(7)	(8)	PG.18C)	(10)	(12)	
			(3)	(1)(X)(3)	(6)	(6)		(9)(X)(7)	(9)	(5% of	(11)	(4)+(9)+(11)	
										(10)	(9)+(10)		
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.031	2	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	72	483	\$751.54	\$54,111	1,028	475,984	\$0.031	71	\$14,807	\$0	\$2,706	\$71,624	
- Non-All Electric	10	179	\$78.60	\$786	314	58,309	\$0.031	54	\$1,756	\$43	\$0	\$2,585	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.000	00	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Resistance Heat	0	42	\$0.00	\$0	1,200	50,400	\$0.031	4	\$1,569	\$0	\$0	\$1,569	
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.031	6	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	41	247	\$428.05	\$17,550	1,144	282,588	\$0.031	10	\$8,788	\$1,186	\$0	\$27,524	
Mobile Home New Construction ***													
- Heat Pump	68	394	\$503.68	\$34,250	1,808	712,352	\$0.031	10	\$22,154	\$276	\$0	\$56,880	
- Air Conditioner	1	1	\$150.00	\$150	157	157	\$0.031	4	\$5	\$0	\$0	\$155	
Modified Energy Fitness	334	735	\$417.78	\$139,931	1,194	977,590	\$0.031	16	\$27,348	\$7,034	\$0	\$173,911	
TOTAL RESIDENTIAL PROGRAMS	526	2,051		\$248,378		2,455,237			\$78,425	\$8,539	\$2,706	\$11,245	\$334,048
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	338	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0	
- Class 2	0	30	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	54	\$0.00	\$0	13,282	717,228	\$0.042	05	\$30,375	\$0	\$0	\$30,375	
Smart Financing - New Building	0	43	\$0.00	\$0	14,101	608,343	\$0.042	7	\$25,933	\$0	\$0	\$25,933	
TOTAL COMMERCIAL PROGRAMS	0	465		\$0		1,325,571			\$56,308	\$0	\$0	\$0	\$56,308
INDUSTRIAL PROGRAMS													
(w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.000	0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.000	00	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0			\$0	\$0	\$0	\$0	
TOTAL COMPANY	526	2,526		\$248,378		3,779,808			\$132,733	\$8,539	\$2,706	\$11,245	\$390,356

* Last revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2001.
 *** Participants since 01/01/2001.

Year 2004													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 10B of 10
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QT (5)	TOTAL ENERGY SAVINGS (6)	NET LOST REVENUE (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.18C) (9)	MAXIMIZING INCENTIVE (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
					(KWH/PARTIC) (5)	KWH/ HALF (6)	(\$/KWH) (7)	(\$)(6)		(%)(10)	(\$)(9)+(10)	(\$)(12)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	705	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	69	462	\$1,118.43	\$99,540	1,028	474,936	\$0.03111	\$14,775	\$0	\$4,977	\$4,977	\$119,292	
- Non-All Electric	72	205	\$60.60	\$4,363	316	64,780	\$0.03121	\$2,024	\$308	\$0	\$308	\$6,695	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Resistance Heat	0	15	\$0.00	\$0	1,200	18,000	\$0.03174	\$561	\$0	\$0	\$0	\$561	
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03176	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	46	230	\$469.57	\$21,900	1,144	273,416	\$0.03110	\$6,503	\$1,330	\$0	\$1,330	\$31,433	
Mobile Home New Construction **													
- Heat Pump	70	379	\$67.14	\$41,800	1,810	685,930	\$0.03110	\$21,334	\$284	\$0	\$284	\$63,418	
- Air Conditioner	0	2	#DIV/0!	\$0	158	316	\$0.03121	\$10	\$0	\$0	\$0	\$10	
Modified Energy Fitness	381	1,070	\$347.20	\$135,756	1,184	1,277,580	\$0.03116	\$38,809	\$8,234	\$0	\$8,234	\$103,709	
TOTAL RESIDENTIAL PROGRAMS	669	2,372		\$303,059		2,795,019		\$87,016	\$10,156	\$4,977	\$15,133	\$405,208	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	191	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	10	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	41	\$0.00	\$0	13,282	544,662	\$0.04235	\$23,062	\$0	\$0	\$0	\$23,062	
Smart Financing - New Building	0	30	\$0.00	\$0	14,102	423,060	\$0.04277	\$18,094	\$0	\$0	\$0	\$18,094	
TOTAL COMMERCIAL PROGRAMS	0	272		\$0		967,622		\$41,156	\$0	\$0	\$0	\$41,156	
INDUSTRIAL PROGRAMS - (West, Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	669	2,644		\$303,059		3,762,640		\$128,172	\$10,156	\$4,977	\$15,133	\$446,364	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2001.
 *** Participants since 07/01/2001.

Year 2005													Exhibit C PAGE 1A of	19
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 10 (1st Half)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST (KWH) PARTICIPANT (5)	TOTAL ENERGY SAVINGS (KWH) HALF (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.18C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)		
			PER PARTICIPANT (3)	(1)X(3)	(5)	(2)X(6)	(7)	(8)X(7)	(9)	(10)	(11)	(12)		
										(9)X(10)		(4)-(10)+(11)		
RESIDENTIAL PROGRAMS														
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0		
Targeted Energy Efficiency														
- All Electric	88	477	\$1,109.22	\$97,611	886	427,992	\$0.03111	\$13,296	\$0	\$4,881	\$4,881	\$115,788		
- Non-All Electric	57	218	\$62.47	\$3,561	267	96,206	\$0.03124	\$1,818	\$1,125	\$0	\$1,125	\$6,504		
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump														
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump														
- Mobile Home	34	231	\$560.21	\$19,047	1,145	264,495	\$0.03110	\$8,226	\$2,693	\$0	\$2,693	\$29,966		
Mobile Home New Construction ***														
- Heat Pump	67	371	\$614.85	\$41,195	1,808	670,768	\$0.03110	\$20,881	\$8,372	\$0	\$8,372	\$70,428		
- Air Conditioner	0	2	\$0.00	\$0	157	314	\$0.03124	\$10	\$0	\$0	\$0	\$10		
Modified Energy Fitness	371	1,479	\$400.87	\$148,723	613	906,627	\$0.03116	\$28,250	\$15,612	\$0	\$15,612	\$192,585		
TOTAL RESIDENTIAL PROGRAMS	617	2,778		\$310,137		2,327,802		\$72,461	\$27,802	\$4,881	\$32,683	\$415,281		
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	64	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
- Class 2	0	3	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	29	\$0.00	\$0	13,282	365,178	\$0.04435	\$16,312	\$0	\$0	\$0	\$16,312		
Smart Financing - New Building	0	18	\$0.00	\$0	14,101	253,918	\$0.04377	\$10,856	\$0	\$0	\$0	\$10,856		
TOTAL COMMERCIAL PROGRAMS	0	114		\$0		638,996		\$27,168	\$0	\$0	\$0	\$27,168		
INDUSTRIAL PROGRAMS														
(W/Ext. Opt-Outs Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0		
TOTAL COMPANY	617	2,892		\$310,137		2,966,798		\$99,629	\$27,802	\$4,881	\$32,683	\$442,448		

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2002.
 *** Participants since 07/01/2002.

Year 2005													EXHIBIT C PAGE 19 of 19	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 10 (2nd HALF)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL PROGRAM COSTS (4)	NET LOST REV/CTRS (5)	TOTAL ENERGY SAVINGS (KWH/ HALF) (6)	NET LOST REVENUE (KWH) (7)	TOTAL NET * LOSS (8)	EFFICIENCY INCENTIVE (EX. C, PG.18C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	REVENUES (6)+(7)	TOTAL NET * LOSS (8)-(9)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS	Energy Fitness	0	0	\$0.00	(1)+(3)	705	0	\$0.03112	\$0	(4)+(5)	\$0	\$0	\$0	(11)
Targeted Energy Efficiency	- All Electric	85	482	\$1,207.52	\$102,639	695	440,832	\$0.03111	\$0	\$5,132	\$5,132	\$13,714	\$5,132	\$121,485
- Non-All Electric	26	233	\$62.95	\$1,772	265	61,978	\$0.03124	\$1,930	\$513	\$0	\$513	\$1,417	\$513	\$4,161
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	- Mobile Home	40	225	\$476.78	\$19,071	1,144	257,400	\$0.03110	\$3,108	\$0	\$3,108	\$8,005	\$3,108	\$30,244
Mobile Home New Construction **	- Heat Pump	83	385	\$544.23	\$45,171	1,810	696,850	\$0.03110	\$10,372	\$0	\$10,372	\$21,872	\$10,372	\$77,215
- Air Conditioner	0	2	\$0.00	\$0	158	316	\$0.03124	\$10	\$0	\$0	\$0	\$10	\$0	\$10
Modified Energy Fitness	351	1,826	\$373.12	\$130,955	613	1,117,512	\$0.03118	\$34,022	\$14,770	\$0	\$14,770	\$94,022	\$14,770	\$180,557
TOTAL RESIDENTIAL PROGRAMS	595	3,163	\$299,558	\$299,558		2,574,985		\$80,159	\$28,823	\$5,132	\$33,955	\$413,672	\$33,955	\$413,672
COMMERCIAL PROGRAMS	Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	20	20	\$0.00	\$0	13,282	265,640	\$0.04225	\$11,250	\$0	\$0	\$0	\$11,250	\$0	\$11,250
Smart Financing - New Building	0	11	\$0.00	\$0	14,102	155,122	\$0.04271	\$6,635	\$0	\$0	\$0	\$6,635	\$0	\$6,635
TOTAL COMMERCIAL PROGRAMS	0	31	\$0	\$0		420,762		\$17,885	\$0	\$0	\$0	\$17,885	\$0	\$17,885
INDUSTRIAL PROGRAMS	Smart Audit - Class 1 (w/Est. Opt-Outs Removed)	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00001	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0		0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	565	3,194	\$299,558	\$299,558		2,995,690		\$98,044	\$28,823	\$5,132	\$33,955	\$431,557	\$33,955	\$431,557

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2002.
 *** Participants since 07/01/2002.

Year 2006												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												Exhibit C PAGE 12A of 19
YEAR 11 (1st HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVQTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL INCENTIVE	TOTAL ACTUAL COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT COSTS (3)	(1)X(3) COSTS (4)	(KWH/ PARTICIPANT) (5)	KWH/ HALF (6)	(\$/KWH) (7)	REVENUES (8)	(EX C, PS 16C) (9)	(5% of COSTS) (10)	(9)X(10) INCENTIVE (11)	(4)X(6)X(11) RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	75	495	\$974.31	\$73,073	896	444,416	\$0.03111	\$13,826	\$0	\$3,654	\$3,654	\$30,563
- Non-All Electric	34	249	\$84.56	\$2,875	297	65,493	\$0.03124	\$2,077	\$971	\$0	\$671	\$5,623
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	48	230	\$446.05	\$21,411	1,145	263,350	\$0.03110	\$8,160	\$3,802	\$0	\$3,802	\$33,403
Mobile Home New Construction ***												
- Heat Pump	90	425	\$961.21	\$80,509	1,810	769,250	\$0.03110	\$23,924	\$11,246	\$0	\$11,246	\$85,678
- Air Conditioner	0	2	\$0.00	\$0	157	314	\$0.03124	\$10	\$0	\$0	\$0	\$10
Modified Energy Fitness	440	2,185	\$275.33	\$121,144	613	1,339,405	\$0.03116	\$41,735	\$18,515	\$0	\$18,515	\$181,395
TOTAL RESIDENTIAL PROGRAMS	687	3,587		\$289,012		2,883,218		\$89,763	\$34,234	\$3,654	\$37,888	\$396,663
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	687	3,587		\$289,012		2,883,218		\$89,763	\$34,234	\$3,654	\$37,888	\$396,663

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 08/30/2003.
 *** Participants since 01/01/2003.

Year 2006												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
												Exhibit C PAGE 129 of 19
YEAR 11 (2nd HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVOLVERS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET *	EFFICIENCY	MAXIMIZING	TOTAL *	TOTAL ACTUAL COSTS TO BE
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT (3)	(1)X(3) (4)	(KWH/ PARTICIPANT) (5)	KWH/ HALF (6)	(\$/KWH) (7)	REVENUES (8)X(7)	(EX. C, PG.18C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	RECOVERED (12)
										(4)X(5%)	(9)+(10)	(4)+(8)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	705	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	87	481	\$1,147.48	\$99,829	898	430,978	\$0.03111	\$13,408	\$0	\$4,991	\$4,991	\$119,228
- Non-All Electric	46	254	\$84.00	\$3,864	269	67,564	\$0.03124	\$2,111	\$908	\$0	\$908	\$0,883
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	448	0	\$0.03118	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	45	245	\$460.00	\$20,700	1,144	280,280	\$0.03110	\$8,717	\$3,564	\$0	\$3,564	\$32,981
Mobile Home New Construction ***												
- Heat Pump	84	480	\$544.15	\$51,150	1,808	831,680	\$0.03110	\$25,865	\$11,740	\$0	\$11,740	\$88,781
- Air Conditioner	0	2	\$0.00	\$0	158	318	\$0.03124	\$10	\$0	\$0	\$0	\$10
Modified Energy Fitness	560	2,381	\$427.85	\$239,508	612	1,483,292	\$0.03116	\$45,596	\$23,585	\$0	\$23,585	\$308,757
TOTAL RESIDENTIAL PROGRAMS	632	3,833	\$415,139	\$3,074,108	3,074,108	\$0.03116	\$95,707	\$39,783	\$4,991	\$44,774	\$555,820	
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0/0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	0/0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS												
(w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0/0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0/0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	632	3,833	\$415,139	\$3,074,108	3,074,108	\$0.03116	\$95,707	\$39,783	\$4,991	\$44,774	\$555,820	

* Total revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2003.
 *** Participants since 07/01/2003.

Year 2007													
KENTUCKY POWER COMPANY													
ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
													Exhibit C
													PAGE
													19A of
													19
YEAR 12 (1st HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVOLTRS	TOTAL ENERGY SAVINGS (KWH/ PARTICIPANT)	NET LOST REVENUES (ISAWH)	TOTAL NET* LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL* INCENTIVE	RECOVERED COSTS TO BE	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT COSTS (3)	(1)(X)(3)	(KWH/ PARTICIPANT) (5)	KWH/ HALF (6)	ISAWH (7)	REVENUES (8)	(EX. C. PG.18C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	(12)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03192	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	126	285	\$1,022.27	\$130,851	856	264,320	\$0.04348	\$11,487	\$0	\$6,543	\$6,543	\$148,681	
- Non-All Electric	29	116	\$68.48	\$2,508	277	31,655	\$0.04303	\$1,390	\$572	\$0	\$572	\$4,470	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03194	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03193	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	50	153	\$450.00	\$22,500	1,145	175,185	\$0.04345	\$7,614	\$3,960	\$0	\$3,960	\$34,074	
Mobile Home New Construction ***													
- Heat Pumps	84	304	\$583.10	\$47,350	1,810	550,240	\$0.04348	\$23,924	\$10,487	\$0	\$10,487	\$81,721	
- A/C Conditioner	0	0	\$0.00	\$0	157	0	\$0.04343	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	515	1,605	\$381.00	\$199,214	613	983,665	\$0.04349	\$42,788	\$21,671	\$0	\$21,671	\$250,673	
Case No 2006 - 00373, Dated December 14, 2006:													
- HEAP - Kentucky Power Company's Information Technology Implementation Costs				\$58,998								\$58,998	
- HEAP - KACA's Information Technology Implementation Costs				\$16,700								\$16,700	
TOTAL RESIDENTIAL PROGRAMS	806	2,472		\$474,041		2,005,465		\$87,203	\$36,700	\$0,543	\$43,243	\$504,487	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	806	2,472		\$474,041		2,005,465		\$87,203	\$36,700	\$0,543	\$43,243	\$504,487	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2006.
 *** Participants since 07/01/2006.

Year 2007												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 12 (2nd Half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL PROGRAM COSTS (4)	NET LOST REVOLTRS (KWH) PARTICIPANT HALF (5)	TOTAL ENERGY SAVINGS (KWH) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* (8)	EFFICIENCY INCENTIVE (EX. C. PG. 19C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL* INCENTIVE (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	705	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency - All Electric	100	421	\$879.82	\$87,982	896	377,216	\$0.04346	\$16,394	\$0	\$4,399	\$4,399	\$108,775
- Non-All Electric	50	151	\$89.59	\$4,479	276	41,676	\$0.04352	\$1,818	\$987	\$0	\$987	\$7,284
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resilience Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Non Resilience Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Mobile Home	45	209	\$450.00	\$20,250	1,144	230,096	\$0.04346	\$10,391	\$3,564	\$0	\$3,564	\$34,205
Mobile Home New Construction - Heat Pump	129	425	\$551.54	\$71,200	1,808	770,208	\$0.04348	\$33,489	\$16,120	\$0	\$16,120	\$120,809
- Air Conditioner	0	0	\$0.00	\$0	158	0	\$0.04343	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	485	2,113	\$353.79	\$171,580	612	1,293,156	\$0.04349	\$56,239	\$20,409	\$0	\$20,409	\$248,230
TOTAL RESIDENTIAL PROGRAMS	809	3,320		\$355,501	2,721,352			\$110,331	\$41,080	\$4,399	\$45,479	\$519,311
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	809	3,320		\$355,501	2,721,352			\$110,331	\$41,080	\$4,399	\$45,479	\$519,311
* Lost revenue and efficiency incentives are based on prospective values.												
** Cumulative participants include a reduction for the cumulative participants as of 06/30/2005.												
*** Participants since 07/01/2005.												

Year 2008													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												Exhibit C PAGE 14A of	10
YEAR 13 (1st HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	TOTAL ESTIMATED PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVIQTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL * INCENTIVE	TOTAL ACTUAL COSTS TO BE	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT COSTS (3)	(1)X(3) (4)	(KWH/ PARTICIPANT) (5)	KWH/ HALF (6)	(\$/KWH) (7)	REVENUES (8)	(EX. C, PG.18C) (9)	(5% of COSTS) (10)	(9)+(10) (11)	(4)+(6)+(11) (12)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	119	521	\$1,358.15	\$181,620	1,016	529,336	\$0.04349	\$23,005	\$0.189	\$0	\$9,189	\$193,814	
- Non-All Electric	55	196	\$83.11	\$4,654	568	111,328	\$0.04349	\$4,837	\$3,454	\$0	\$3,454	\$12,945	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	81	252	\$457.38	\$27,900	875	220,500	\$0.04346	\$9,583	\$8,539	\$0	\$8,539	\$48,022	
Mobile Home New Construction ***													
- Heat Pump	95	520	\$552.63	\$52,500	861	447,720	\$0.04348	\$18,467	\$10,597	\$0	\$10,597	\$82,564	
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	560	2,612	\$361.32	\$202,399	435	1,139,220	\$0.04347	\$49,414	\$27,871	\$0	\$27,871	\$279,624	
TOTAL RESIDENTIAL PROGRAMS	891	4,101		\$449,013		2,445,104		\$108,306	\$59,650	\$0	\$59,650	\$614,988	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	na	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	na	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	na	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	na	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	891	4,101		\$449,013		2,445,104		\$108,306	\$59,650	\$0	\$59,650	\$614,988	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2005.
 *** Participants since 07/01/2005.

Year 2008		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		TOTAL ESTIMATED PROGRAM COSTS		TOTAL ACTUAL PROGRAM COSTS		NET LOST REVENUE		TOTAL ENERGY SAVINGS		TOTAL NET * REVENUES		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * INCENTIVE		TOTAL ACTUAL COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER ** (2)	PER PARTICIPANT COSTS (3)	PROGRAM COSTS (4)	REV/CSTRS (5)	KWH/HALF (6)	REVENUE (7)	REVENUES (8)	EX. C. PG.18C (9)	(5% of COSTS) (10)	(4% X 5%) (11)	REVENUES (6) X (7)	REVENUES (8) X (9)	(5% of COSTS) (10)	(4% X 5%) (11)	TOTAL * (11) (9) + (10)	RECOVERED (12)	RECOVERED (12)	RECOVERED (12)	RECOVERED (12)	RECOVERED (12)	RECOVERED (12)	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																							
YEAR 13 (2nd HALF)																							
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency	88	545	\$991.21	\$80,218	1,016	553,720	\$0.04345	\$24,065	\$6,873	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- All Electric	20	223	\$87.50	\$1,750	568	126,664	\$0.04345	\$5,504	\$1,234	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	74	289	\$42.57	\$3,156	874	252,986	\$0.04345	\$10,977	\$10,359	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Mobile Home New Construction	108	548	\$560.00	\$59,400	860	471,280	\$0.04345	\$20,491	\$12,047	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	440	2,793	\$356.35	\$156,792	435	1,214,955	\$0.04345	\$52,836	\$21,899	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL RESIDENTIAL PROGRAMS	731	4,398	\$338.910	\$338,910	2,619,205	2,619,205	\$0.04345	\$113,875	\$52,412	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (W/EL Opt-Outs Removed)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	731	4,398	\$338.910	\$338,910	2,619,205	2,619,205	\$0.04345	\$113,875	\$52,412	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 07/01/2006.

Year 2009												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												Exhibit C PAGE 15A of
	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST	TOTAL ENERGY SAVINGS	NET LOST	TOTAL NET *	EFFICIENCY	MAXIMIZING	TOTAL *	TOTAL ACTUAL
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	COSTS (4)	REV/QTRS (KWH/ PARTICIPANT) (5)	IQWH/ HALF (6)	(\$/KWH) (7)	REVENUES (8)	(EX. C, PG.18C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	TOTAL RECOVERED (12)
	(1)	(2)	(4)/(1)	(4)	(5)	(6)	(7)	(8)/(7)	(9)	(10)	(11)	(12)/(4)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	118	575	\$1,050.16	\$126,159	1,916	584,200	\$0.04316	\$25,389	\$9,189	\$0	\$9,189	\$160,737
- Non-All Electric	22	219	\$93.27	\$2,052	568	119,260	\$0.04352	\$5,191	\$1,357	\$0	\$1,357	\$9,600
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	61	299	\$449.18	\$27,400	875	261,625	\$0.04360	\$11,391	\$8,539	\$0	\$8,539	\$47,320
Mobile Home New Construction												
- Heat Pump	88	552	\$552.64	\$48,550	861	475,272	\$0.04351	\$20,679	\$9,816	\$0	\$9,816	\$79,145
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	425	2,776	\$383.51	\$162,693	435	1,207,125	\$0.04345	\$52,450	\$21,152	\$0	\$21,152	\$236,595
High Efficiency Heat Pump												
- Resistance Heat Replacement	28	7	\$305.36	\$8,550	1,879	13,153	\$0.04349	\$572	\$13,387	\$0	\$13,387	\$22,509
- Heat Pump Replacement	61	16	\$442.62	\$27,000	301	4,616	\$0.04353	\$210	\$0	\$1,350	\$1,350	\$28,560
Energy Education for Student Program (NEED)	0	0	\$0.00	\$8,139	92	0	\$0.04370	\$0	\$0	\$0	\$0	\$9,139
Community Outreach Program (CFL)	926	149	\$5.84	\$5,404	92	13,708	\$0.04370	\$589	\$4,621	\$0	\$4,621	\$10,624
TOTAL RESIDENTIAL PROGRAMS	1,730	4,693		\$416,347		2,679,179		\$119,471	\$58,061	\$1,350	\$69,411	\$602,229

COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Buildings	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0

INDUSTRIAL PROGRAMS -												
(w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	1,730	4,693		\$416,347		2,679,179		\$119,471	\$58,061	\$1,350	\$69,411	\$602,229

* Lost revenue and efficiency incentives are based on prospective values.												
** Cumulative participants include a reduction for the cumulative participants as of 07/01/2009.												
*** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).												

Year 2009													Exhibit C PAGE 158 of 19	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 14 (2nd HALF)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (6) (2)*(5)	NET LOST REVENUE (KWH/ (7) (1)*(7)	EFFICIENCY INCENTIVE (EX. C. PG.18C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)*(5%)	INCENTIVE TOTAL * (11) (9)+(10)	RECOVERED COSTS TO BE (12) (4)-(9)+(11)			
RESIDENTIAL PROGRAMS														
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
Targeted Energy Efficiency														
- All Electric	140	620	\$953.48	\$139,087	1,016	629,920	\$0.04348	\$27,376	\$10,811	\$10,811	\$177,274			
- Non-All Electric	61	200	\$101.34	\$6,182	569	113,600	\$0.04351	\$4,944	\$3,762	\$3,762	\$14,868			
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
High - Efficiency Heat Pump	59	342	\$448.49	\$44,500	874	288,908	\$0.04359	\$13,002	\$13,959	\$13,959	\$71,351			
- Mobile Home														
Mobile Home New Construction	103	356	\$544.17	\$56,050	860	478,160	\$0.04351	\$20,805	\$11,480	\$11,480	\$88,345			
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
Modified Energy Fitness	375	2,631	\$372.99	\$139,871	435	1,144,485	\$0.04345	\$49,728	\$19,664	\$19,664	\$208,263			
High Efficiency Heat Pump														
- Resistance Heat Replacement	63	60	\$514.29	\$32,400	1,679	112,740	\$0.04349	\$4,903	\$30,120	\$30,120	\$67,423			
- Heat Pump Replacement	156	144	\$451.92	\$70,500	300	49,200	\$0.04343	\$1,880	\$3,525	\$3,525	\$75,905			
Energy Education for Student Program (NEED)	1,130	558	\$8.00	\$9,045	92	51,336	\$0.04370	\$2,243	\$5,627	\$5,627	\$16,915			
Community Outreach Program (CFL)	2,818	2,501	\$10.19	\$26,715	92	230,092	\$0.04370	\$10,055	\$14,062	\$14,062	\$62,832			
TOTAL RESIDENTIAL PROGRAMS	4,945	7,812	\$226.350	\$526,350	3,102,441	3,102,441		\$134,935	\$108,395	\$111,920	\$773,206			
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0			
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0			
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
TOTAL COMMERCIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0			
INDUSTRIAL PROGRAMS - (VIEEL On-Cuts Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0			
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0			
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0			
TOTAL COMPANY	4,945	7,812	\$226.350	\$526,350	3,102,441	3,102,441		\$134,935	\$108,395	\$111,920	\$773,206			

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2007
 *** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2010												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												Exhibit C PAGE 16A of
YEAR 15 (1st HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/OTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET *	EFFICIENCY LOST	MAXIMIZING INCENTIVE	TOTAL *	TOTAL ACTUAL COSTS TO BE
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	COSTS (4)	(KWH/ PARTICIPANT) (5)	KWH/ QTR (6)	(\$/KWH) (7)	REVENUES (8)(7)	(EX. C. PG.16C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	RECOVERED (12)
RESIDENTIAL PROGRAMS	(1)	(2)	(4)/(1)	(4)	(5)	(6)	(7)	(8)(7)	(9)	(10)	(11)	(12)
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	174	720	** \$1,161.51	\$202,103	1,016	731,520	\$0.04316	\$31,792	\$13,438	\$0	\$13,438	\$247,331
- Non-All Electric	31	237	** \$114.10	\$3,637	568	134,618	\$0.04342	\$6,856	\$1,912	\$0	\$1,912	\$11,307
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	97	416	** \$422.16	\$40,950	675	364,000	\$0.04320	\$15,834	\$13,579	\$0	\$13,579	\$70,363
Mobile Home New Construction												
- Heat Pump	115	621	** \$527.63	\$60,700	861	534,681	\$0.04311	\$23,264	\$4,462	\$0	\$4,462	\$88,426
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	501	2,762	** \$392.69	\$186,836	435	1,201,470	\$0.04315	\$52,204	\$24,935	\$0	\$24,935	\$273,975
High Efficiency Heat Pump												
- Resistance Heat Replacement	97	135	** \$450.00	\$43,650	1,879	253,665	\$0.04319	\$11,032	\$46,376	\$0	\$46,376	\$101,058
- Heat Pump Replacement	272	348	** \$416.73	\$113,350	301	104,748	\$0.04313	\$4,560	\$0	\$5,626	\$5,626	\$123,578
Energy Education for Student Program (NEED)	490	1,299	** \$50.89	\$24,891	73	94,927	\$0.04327	\$4,103	\$2,430	\$0	\$2,430	\$31,414
Community Outreach Program (CFL)	2,644	4,482	** \$18.10	\$42,804	91	407,992	\$0.04376	\$17,848	\$13,184	\$0	\$13,184	\$73,606
TOTAL RESIDENTIAL PROGRAMS	4,419	11,020		\$726,671		3,827,369		\$166,485	\$120,324	\$5,668	\$125,992	\$1,021,058
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (W/EAL Opt-Out Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	4,419	11,020		\$726,671		3,827,369		\$166,485	\$120,324	\$5,668	\$125,992	\$1,021,058

** Lost revenue and efficiency incentives are based on prospective values.
 *** Cumulative participants include a reduction for the cumulative participants as of 01/01/2007.
 **** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2010												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												Exhibit C PAGE 169-1 of
YEAR 15 (2nd HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/QTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET *	EFFICIENCY	MAXIMIZING	TOTAL *	TOTAL ACTUAL COSTS TO BE
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	PROGRAM COSTS (4)	(KWH/ PARTICIPANT) (5)	KWH/ QTRs (6)	(\$/KWH) (7)	REVENUES (8)	(K.C. PG.18C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	RECOVERED (12)
			(4)/(1)		(5)/(6)			(8)/(7)		(10)/(9)	(11)/(10)	(12)/(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	172	787	\$869.62	\$139,254	1,019	799,592	\$0.05748	\$45,345	\$13,282	\$0	\$13,282	\$198,481
- Non-All Electric	23	242	\$102.35	\$2,354	568	137,456	\$0.05748	\$7,838	\$1,419	\$0	\$1,419	\$11,671
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	136	495	\$468.49	\$63,850	875	434,000	\$0.05750	\$24,955	\$19,039	\$0	\$19,039	\$107,844
Mobile Home New Construction												
- Heat Pump	119	617	\$558.82	\$66,500	861	531,237	\$0.05748	\$30,520	\$13,274	\$0	\$13,274	\$110,294
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	699	2,939	\$317.39	\$221,857	435	1,278,465	\$0.05752	\$73,537	\$34,769	\$0	\$34,769	\$330,163
High Efficiency Heat Pump												
- Resistance Heat Replacement	165	264	\$326.00	\$50,530	1,079	496,059	\$0.05748	\$28,513	\$74,105	\$0	\$74,105	\$153,149
- Heat Pump Replacement	237	621	\$559.79	\$132,670	301	189,921	\$0.05750	\$10,748	\$0	\$6,634	\$6,634	\$150,052
Energy Education for Student Program (NEED)	1,059	1,220	\$5.55	\$5,880	74	90,280	\$0.0574	\$5,159	\$5,274	\$0	\$5,274	\$16,313
Community Outreach Program (CFL)	2,167	3,516	\$3.72	\$14,570	91	319,958	\$0.0578	\$18,455	\$10,813	\$0	\$10,813	\$43,838
Residential Efficient Products												
- Compact Fluorescent Lamp (CFL)	0	0	\$0.00	\$0	0	0	\$0.05818	\$0	\$0	\$0	\$0	\$0
- Specialty Bulbs	0	0	\$0.00	\$0	0	0	\$0.05793	\$0	\$0	\$0	\$0	\$0
- LED Lights	0	0	\$0.00	\$0	0	0	\$0.05844	\$0	\$0	\$0	\$0	\$0
HVAC Diagnostic & Tune-Up												
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.05718	\$0	\$0	\$0	\$0	\$0
- Heat Pump	29	31	\$101.79	\$2,850	371	1,113	\$0.05749	\$64	\$319	\$0	\$319	\$3,233
Residential Load Management												
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.0000	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	4,795	10,705		\$700,315		4,275,076		\$245,794	\$172,315	\$6,634	\$178,949	\$1,125,058

Year 2010													Exhibit C PAGE 165-2 of 19	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 19 (2nd HALF)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/CITRS (KWH PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/CITRS (2)*(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8) (6)*(7)	EFFICIENCY INCENTIVE (EX. C, P.G.16C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)*(5%)	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)		
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0,000.00	\$0	\$0	\$0	\$0	\$0		
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0,000.00	\$0	\$0	\$0	\$0	\$0		
Commercial A/C & Heat Pump Program														
- Air Conditioner Replacement	0	0	\$0.00	\$0	0	0	\$0,148.00	\$0	\$0	\$0	\$0	\$0		
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0,565.00	\$0	\$0	\$0	\$0	\$0		
HVAC Diagnostic & Tune-Up														
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0,054.63	\$0	\$0	\$0	\$0	\$0		
- Heat Pump	1	0	\$125.00	\$125	0	0	\$0,054.75	\$0	\$0	\$0	\$0	\$0		
Commercial Lead Management														
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0,000.00	\$0	\$0	\$0	\$0	\$0		
- Water Heating	0	0	\$0.00	\$0	0	0	\$0,000.00	\$0	\$0	\$0	\$0	\$0		
Commercial Incentive	0	0	\$0.00	\$0	0	0	\$0,266.67	\$0	\$0	\$0	\$0	\$0		
TOTAL COMMERCIAL PROGRAMS	1	0		\$125	0	0		\$0	\$0	\$0	\$0	\$0		
INDUSTRIAL PROGRAMS - (West. Op-Cutis Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0,000.00	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0,000.00	\$0	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0		
TOTAL COMPANY	4,756	10,705		\$700,440	0	4,275,076		\$245,794	\$172,345	\$6,634	\$178,979	\$1,125,213		

* Lost revenue and efficiency incentives are based on prospective values
 ** Cumulative participants include a reduction for the cumulative participants as of 04/01/2007
 *** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CEL))

Year 2011												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											Exhibit C PAGE 17A-1 of	
YEAR 16 (1st HALF)											19	
	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REVQTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET *	EFFICIENCY	MAXIMIZING	TOTAL *	TOTAL ACTUAL COSTS TO BE
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3) (4)/(1)	COSTS (4)	(KWH/ PARTICIPANT) (5)	KWH/ QTR (6)	(\$/KWH) (7)	REVENUES (8)	(EX. C. PG.18C) (9)	(5% of COSTS) (10) (3)*(10)	INCENTIVE (11) (4)+(10)	RECOVERED (12) (4)+(10)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	110	814	\$692.04	\$76,124	1,050	854,700	\$0.05743	\$49,111	\$16,253	\$0	\$16,253	\$141,488
- Non-All Electric	0	239	\$140.17	\$841	448	93,184	\$0.05743	\$5,354	\$0	\$42	\$42	\$6,237
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	94	442	\$502.11	\$47,188	1,403	620,126	\$0.05730	\$35,657	\$27,615	\$0	\$27,615	\$110,470
Mobile Home New Construction												
- Heat Pump	68	824	\$680.15	\$48,250	731	456,144	\$0.05735	\$29,295	\$8,393	\$0	\$8,393	\$76,848
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	645	3,039	\$348.52	\$223,603	283	860,037	\$0.05742	\$49,469	\$9,456	\$0	\$9,456	\$282,429
High Efficiency Heat Pump												
- Resistance Heat Replacement	154	329	\$452.59	\$89,699	728	238,784	\$0.05748	\$13,725	\$12,030	\$0	\$12,030	\$95,454
- Heat Pump Replacement	212	508	\$429.25	\$91,000	923	561,184	\$0.05730	\$32,268	\$25,033	\$0	\$25,033	\$146,301
Energy Education for Student Program (NEED)	938	2,034	\$12.40	\$11,635	48	97,932	\$0.05714	\$5,579	\$1,613	\$0	\$1,613	\$18,827
Community Outreach Program (CFL)	2,518	5,442	\$19.83	\$50,179	50	272,100	\$0.05758	\$15,695	\$9,871	\$0	\$9,871	\$75,745
Residential Efficient Products												
- Compact Fluorescent Lamp (CFL)	77,764	20,801	\$1.82	\$141,810	17	353,617	\$0.05808	\$20,673	\$24,167	\$0	\$24,167	\$188,490
- Specialty Bulbs	0	0	\$0.00	\$8	15	0	\$0.05703	\$0	\$0	\$0	\$0	\$8
- LED Lamps	0	0	\$0.00	\$259	21	0	\$0.05854	\$0	\$0	\$0	\$0	\$259
HVAC Diagnostic & Tune-Up												
- Air Conditioner	64	19	\$50.00	\$3,200	155	2,945	\$0.05719	\$169	\$84	\$0	\$84	\$3,453
- Heat Pump	290	148	\$72.24	\$20,950	371	54,906	\$0.05786	\$3,157	\$3,308	\$0	\$3,308	\$27,407
Residential Load Management												
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	82,683	34,507		\$782,656		4,455,361		\$258,962	\$135,755	\$42	\$135,797	\$1,175,415

Year 2011												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											Exhibit C PAGE 17A-2 of 19	
YEAR 16 (1st HALF)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/QTRS	TOTAL ENERGY SAVINGS KWH/ QTR	NET LOST REVENUE (\$/KWH)	TOTAL NET * LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL * INCENTIVE	TOTAL ACTUAL COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (4)/(1)	PROGRAM COSTS (4)	(KWH/ PARTICIPANT) (5)	KWH/ QTR (6)	(\$/KWH) (7)	REVENUES (8)	(EX. C, PG.18C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	RECOVERED (12)
			(4)/(1)		(2)*(5)			(8)*(7)		(4)*(10)	(9)+(10)	(4)+(8)+(11)
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program												
- Air Conditioner Replacement	1	0	\$300.00	\$300	140	0	\$0.14000	\$0	\$1	\$0	\$1	\$301
- Heat Pump Replacement	15	4	\$256.67	\$3,850	558	2,232	\$0.58500	\$1,308	\$872	\$0	\$872	\$5,030
HVAC Diagnostic & Tune-Up												
- Air Conditioner	11	0	\$0.00	\$0	343	0	\$0.06400	\$0	\$7	\$0	\$7	\$7
- Heat Pump	18	8	\$72.22	\$1,300	818	6,544	\$0.06400	\$424	\$532	\$0	\$532	\$2,296
Commercial Load Management												
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Commercial Incentive	0	0	\$0.00	\$0	0	0	\$0.25667	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	35	12	\$5,450	\$5,450	8,775	8,775	\$0.63000	\$1,732	\$1,412	\$0	\$1,412	\$8,594
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	82,886	34,518	\$788,106	\$788,106	4,474,137	4,474,137	\$0.17600	\$258,694	\$137,167	\$42	\$137,209	\$1,164,009

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CEL)).

Year 2011													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 16 (3rd QTR)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS PER PARTICIPANT (4)/(1)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REV/OIERS (5)	TOTAL ENERGY SAVINGS (KWH) CIERS (2)X(5)	NET LOST REVENUE (KWH) (7)	TOTAL NET* LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.16C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (11)	EMPHI C PAGE 17B-1 of 19	TOTAL ESTIMATED COSTS TO BE RECOVERED (12)
PROGRAM DESCRIPTIONS			(4)/(1)	(4)	(5)	(2)X(5)	(7)	(8)	(9)	(10)	(11)		(12)
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
Targeted Energy Efficiency													
- All Electric	130	678	\$1,306.35	\$168,825	525	461,928	\$0,05749	\$26,550	\$19,208	\$0	\$19,208		\$215,584
- Non-All Electric	28	185	\$194.08	\$5,046	224	37,632	\$0,05746	\$2,162	\$0	\$252	\$252		\$7,460
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
High - Efficiency Heat Pump	77	546	\$487.52	\$37,539	702	383,292	\$0,05750	\$22,039	\$22,621	\$0	\$22,621		\$82,199
- Mobile Home													
Mobile Home New Construction													
- Heat Pump	70	581	\$562.01	\$39,341	365	212,065	\$0,05749	\$12,182	\$5,581	\$0	\$5,581		\$58,114
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		\$0
Modified Energy Fitness	318	3,013	\$409.00	\$130,063	142	427,046	\$0,05757	\$24,631	\$4,662	\$0	\$4,662		\$159,956
High Efficiency Heat Pump													
- Resistance Heat Replacement	58	183	\$410.74	\$23,823	365	65,795	\$0,05745	\$3,837	\$4,531	\$0	\$4,531		\$32,191
- Heat Pump Replacement	146	285	\$530.65	\$77,477	481	131,369	\$0,05740	\$7,555	\$17,240	\$0	\$17,240		\$102,272
Energy Education for Student Program (NEED)	200	971	\$18.24	\$3,647	24	23,304	\$0,05740	\$1,340	\$344	\$0	\$344		\$5,331
Community Outreach Program (CFL)	1,432	3,157	\$4.53	\$5,482	25	92,082	\$0,05745	\$4,732	\$5,613	\$0	\$5,613		\$16,827
Residential Efficient Products													
- Compact Fluorescent Lamp (CFL)	34,309	95,790	\$3.80	\$130,258	8	769,240	\$0,05818	\$44,590	\$10,636	\$0	\$10,636		\$185,474
- Specialty Bulbs	13	2	\$25.85	\$336	7	14	\$0,05743	\$1	\$4	\$0	\$4		\$341
- LED Lights	15	3	\$48.39	\$871	10	30	\$0,05664	\$2	\$0	\$44	\$44		\$917
HVAC Diagnostic & Tune-Up													
- Air Conditioner	93	114	\$290.85	\$27,049	79	6,992	\$0,05749	\$511	\$122	\$0	\$122		\$27,692
- Heat Pump	84	342	\$40.67	\$3,416	165	63,270	\$0,05749	\$3,637	\$956	\$0	\$956		\$9,006
Residential Load Management													
- Air Conditioner	30	7	\$1,294.90	\$38,847	0	0	\$0,00000	\$0	\$0	\$0	\$0		\$38,847
- Water Heating	30	7	\$1,294.90	\$38,847	0	0	\$0,00000	\$0	\$0	\$0	\$0		\$38,847
TOTAL RESIDENTIAL PROGRAMS	37,034	106,037		\$732,868		2,664,675		\$153,769	\$92,518	\$296	\$92,814		\$979,451

Year 2011		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ESTIMATED PROGRAM COSTS		TOTAL ESTIMATED PROGRAM COSTS		NET LOST REVENUE		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET * LOSS		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * INCENTIVE		TOTAL ESTIMATED COSTS TO BE RECOVERED		
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REVENUE (KWH/RTS) (5)	TOTAL ENERGY SAVINGS (KWH/RTS) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOSS (8)	EFFICIENCY INCENTIVE (EX. C. PG.10C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	REVENUES (8)	REVENUES (6)*(7)	REVENUES (8)	REVENUES (6)*(7)	INCENTIVE (11)	INCENTIVE (9)+(10)	INCENTIVE (11)	INCENTIVE (9)+(10)	INCENTIVE (11)	INCENTIVE (9)+(10)	INCENTIVE (11)	INCENTIVE (9)+(10)	INCENTIVE (11)	INCENTIVE (9)+(10)	INCENTIVE (11)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																										
YEAR 16 (Old QTR)																										
COMMERCIAL PROGRAMS																										
Smart Audit - Class 1	0	0	50.00	\$0	0	0	0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Audit - Class 2	0	0	80.00	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - Existing Building	0	0	80.00	\$0	0	0	\$0.00000	\$0	0	0	0	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - New Building	0	0	50.00	\$0	0	0	\$0.00000	\$0	0	0	0	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial ARC & Heat Pump Program																										
- Air Conditioner Replacement	19	10	\$743.32	\$14,123	71	710	\$0.07447	\$53	\$18	\$18	\$53	\$0.7447	\$14,123	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18
- Heat Pump Replacement	15	23	\$1,328.43	\$19,925	279	6,417	\$0.07433	\$477	\$972	\$972	\$477	\$0.07433	\$19,925	\$972	\$972	\$972	\$972	\$972	\$972	\$972	\$972	\$972	\$972	\$972	\$972	\$972
HVAC Diagnostic & Tune-Up																										
- Air Conditioner	45	25	\$350.23	\$15,760	172	4,300	\$0.07434	\$119	\$326	\$326	\$119	\$0.07434	\$15,760	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326	\$326
- Heat Pump	14	25	\$127.29	\$1,782	410	10,250	\$0.07493	\$761	\$474	\$474	\$761	\$0.07493	\$1,782	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	
Commercial Load Management																										
- Air Conditioner	7	2	\$516.85	\$4,318	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0.00000	\$4,318	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Water Heating	7	2	\$616.55	\$4,318	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0.00000	\$4,318	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial Incentive	30	10	\$10,347.27	\$310,418	3,739	37,390	\$8,075.12	\$2,909	\$71,420	\$71,420	\$2,909	\$8,075.12	\$310,418	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420	\$71,420
TOTAL COMMERCIAL PROGRAMS	137	97		\$370,544		95,067		\$1,419	\$73,050	\$73,050	\$1,419	\$370,544	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	\$73,050	
INDUSTRIAL PROGRAMS - (W/Est. Opt-Outs Removed)																										
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - General	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL COMPANY	37,171	105,134		\$1,105,512		2,723,742		\$159,189	\$165,568	\$165,568	\$159,189	\$1,105,512	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	\$165,568	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program [CFL]).

Year 2011												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 16 (4th QTR)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REV/QTRS (5)	TOTAL ENERGY SAVINGS (KWH) QTRs (6) (2)(X)5	NET LOST REVENUE (KWH) (7) (6)(X)7	TOTAL NET* LOSS (8) (6)(X)7	EFFICIENCY INCENTIVE (EX C. PG.10C) (9) (8)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X) 5%	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ESTIMATED COSTS TO BE RECOVERED (12) (4)+(8)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	110	908	\$1,306.35	\$143,699	526	477,608	\$0,05749	\$27,458	\$16,253	\$0	\$16,253	\$167,410
- All Electric	23	181	\$194.09	\$4,454	224	40,544	\$0,05746	\$2,350	\$0	\$223	\$223	\$7,017
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	59	305	\$487.51	\$28,763	702	214,812	\$0,05765	\$12,352	\$17,333	\$0	\$17,333	\$56,448
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction	67	595	\$581.34	\$37,408	355	217,540	\$0,05749	\$12,505	\$6,299	\$0	\$6,299	\$55,214
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	248	3,107	\$409.00	\$101,433	142	441,194	\$0,05757	\$25,400	\$3,636	\$0	\$3,636	\$130,469
High Efficiency Heat Pump	60	465	\$397.05	\$23,823	365	169,725	\$0,05745	\$9,751	\$4,687	\$0	\$4,687	\$39,261
- Resistance Heat Replacement	142	860	\$45.91	\$7,477	461	400,148	\$0,05750	\$23,009	\$16,767	\$0	\$16,767	\$117,253
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Education for Student Program (NEED)	662	1,669	\$16.23	\$15,718	24	40,056	\$0,05750	\$2,303	\$1,483	\$0	\$1,483	\$19,504
Community Outreach Program (CFL)	850	4,525	\$4.52	\$3,839	26	117,650	\$0,05765	\$6,763	\$3,332	\$0	\$3,332	\$13,954
Residential Efficient Products	23,872	125,257	\$3.92	\$93,468	8	1,002,056	\$0,05678	\$58,300	\$7,400	\$0	\$7,400	\$159,168
- Compact Fluorescent Lamp (CFL)	12	23	\$20.08	\$241	7	161	\$0,05743	\$9	\$4	\$0	\$4	\$264
- LED Lights	757	359	\$0.83	\$625	10	3,360	\$0,05654	\$198	\$0	\$31	\$31	\$651
HVAC Diagnostic & Tune-Up	23	129	\$353.83	\$8,138	78	10,062	\$0,05749	\$578	\$30	\$0	\$30	\$8,746
- Air Conditioner	26	384	\$39.54	\$1,028	165	71,040	\$0,05749	\$4,084	\$295	\$0	\$295	\$3,408
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Residential Load Management	220	138	\$415.81	\$91,478	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$91,478
- Air Conditioner	220	138	\$415.81	\$91,478	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$91,478
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	27,951	139,033	\$723.081	\$723,081	3,205,988	3,205,988	\$165,061	\$77,520	\$254	\$77,774	\$95,916	

Year 2011												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM											EXHIBIT C PAGE 17C-2 of	19
YEAR 16 (4th QTR)	NEW PARTICIPANT	CUMULATIVE PARTICIPANT	AVERAGE ESTIMATED PROGRAM COSTS	TOTAL ESTIMATED PROGRAM COSTS	NET LOST REV/QTRS	TOTAL ENERGY SAVINGS KWH/ QTRs	NET LOST REVENUE (\$/KWH)	TOTAL NET *	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL *	TOTAL ESTIMATED COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3) (4)/(1)	COSTS (4)	(KWH/ PARTICIPANT) (5)	(KWH/ QTRs) (6) (2)(X)(5)	(\$/KWH) (7)	REVENUES (8) (8)(X)(7)	(EX. C, PG. 18C) (9)	(5% of COSTS) (10) (4)(X)(5)	INCENTIVE (11) (9)+(10)	(12) (4)+(9)+(11)
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program												
- Air Conditioner Replacement	5	17	\$738.50	\$3,693	71	1,207	\$0.07447	\$90	\$5	\$0	\$5	\$3,788
- Heat Pump Replacement	10	24	\$521.00	\$5,210	278	9,898	\$0.07430	\$488	\$581	\$0	\$581	\$6,298
HVAC Diagnostic & Tune-Up												
- Air Conditioner	14	65	\$338.71	\$4,742	172	11,189	\$0.07424	\$830	\$101	\$0	\$101	\$5,673
- Heat Pump	8	31	\$67.50	\$536	410	12,710	\$0.07478	\$944	\$236	\$0	\$236	\$1,718
Commercial Load Management												
- Air Conditioner	18	15	\$564.84	\$10,168	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$10,168
- Water Heating	18	15	\$564.84	\$10,168	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$10,168
Commercial Incentive	58	55	\$10,347.28	\$600,142	3,739	205,645	\$0.07542	\$15,448	\$138,078	\$0	\$138,078	\$753,666
TOTAL COMMERCIAL PROGRAMS	131	222		\$534,861		237,438		\$17,810	\$138,001	\$0	\$138,001	\$791,472
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Garage	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	27,582	138,255		\$1,357,742		3,443,424		\$202,871	\$216,521	\$294	\$216,775	\$1,777,388

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CEL)).

KENTUCKY POWER COMPANY				Exhibit C
FORECAST OF 2011 KENTUCKY RETAIL ENERGY SALES IN KWH				PAGE 19 of
FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SECTORS				19
PROGRAM YR 16 - 2011				
LINE NO.	YEAR	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
1	TOTAL ULTIMATE SALES (KWH) *	1,199,800,000	736,400,000	1,614,400,000
2	LESS NON-METERED **	7,198,800	4,418,400	9,686,400
3	TOTAL ESTIMATED RETAIL KWH SALES	1,192,601,200	731,981,600	1,604,713,600
4	LESS OPT - OUT CUSTOMERS KWH	0	0	0
5	KWH BEFORE LOST REVENUE IMPACTS	1,192,601,200	731,981,600	1,604,713,600
6	LESS LOST REVENUE IMPACTS ***	10,336,022	305,281	0
7	ADJUSTED KWH BY SECTOR	1,182,265,178	731,676,319	1,604,713,600
8	LINE 7/LINE 1	98.5%	99.4%	99.4%
LINE NO.	PROGRAM YR 16 (3rd QTR)	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
9	TOTAL ULTIMATE SALES (KWH) *	554,100,000	373,200,000	774,900,000
10	LINE 8	98.5%	99.4%	99.4%
11	ADJUSTED KWH BY SECTOR	545,788,500	370,960,800	770,250,600
LINE NO.	PROGRAM YR 16 (4th QTR)	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
12	TOTAL ULTIMATE SALES (KWH) *	645,700,000	363,200,000	839,500,000
13	LINE 8	98.5%	99.4%	99.4%
14	ADJUSTED KWH BY SECTOR	636,014,500	361,020,800	834,463,000
* SOURCE: 2011 LOAD FORECAST COMPILED BY AEP CORPORATE PLANNING AND BUDGETING DEPT.				
** .60% ESTIMATED TO BE NON-METERED (OL) DETERMINED FROM BILLED JURISDICTIONAL TARIFF SUMMARY FOR 12 MOS. ENDED DECEMBER 2009.				
*** LOST REVENUE IMPACTS				
	Page 17A of 18, Column 6 - TOTAL RESIDENTIAL PROGRAMS	4,465,361	8,776	-
	Page 17B of 18, Column 6 - TOTAL RESIDENTIAL PROGRAMS	2,664,675	59,067	-
	Page 17C of 18, Column 6 - TOTAL RESIDENTIAL PROGRAMS	3,205,986	237,438	-
	TOTAL	10,336,022	305,281	-



Kentucky Power Company

REQUEST

Refer to page 4 of the Status Report in the application ("Application"). The year-to-date program cost for the all-electric portion of the Targeted Energy Efficiency ("TEE") program is \$61,912, with 48 participants.

- a. Explain whether any high-efficiency heat pumps were installed, or whether the programs represent the cost of weatherization only.
- b. If high-efficiency heat pumps were installed, provide the number by community action agency.
- c. Explain whether there are to be any high-efficiency heat pumps installed in 2014 for any of the 145 participants.
- d. Explain whether Kentucky Power has met or plans to meet with the community action agencies to discuss future participation.

RESPONSE

- a. The cost represents weatherization work completed. No heat pumps were installed.
- b. Not applicable.
- c. Ten heat pumps are planned for installation in 2014.
- d. Kentucky Power, in conjunction with each Community Action agency, determined the 2014 participation levels on a conference call during the 3rd quarter of 2013.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 4 of the Status Report in the Application. The year-to-date program costs for the non-all-electric portion of the TEE program is \$909, with 11 participants. The estimates for the second half of 2013 are \$4,916 in program costs with nine participants. Explain the cost differential per participant for the first six months of 2013 versus the second six months of 2013.

RESPONSE

The \$909 stated in the question are actual expenses incurred during the 1st half of 2013. The \$4,916 referred in the question is forecasted expenses for the 2nd half of 2013.

The cost differential is due to the estimated EMV expense which was incurred only during the second half of 2013. The actual evaluation expense for 2013 totaled \$3,973.95. Non-electric customers incurred \$521.62, while all electric customers incurred \$3,452.33 for evaluation services.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 5 of the Status Report in the Application. The 2013 projected participants and program costs are 200 and \$94,188 respectively for the High Efficiency Heat Pump — Mobile Home program. The 2014 projected participants and program costs are 220 and \$114,098 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The differential is primarily due to evaluation expenses. The majority will be incurred in 2014.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 6 of the Status Report in the Application. The 2013 projected participants and program costs are 135 and \$77,111 respectively for the Mobile Home New Construction program. The 2014 projected participants and program costs are 155 and \$98,872 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The differential reflects the fact that the majority of the evaluation expenses will be incurred in 2014. In addition, the marketing budget was increased by \$600 in 2014.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 7 of the Status Report in the Application.

- a. Explain the methodology that was used in selecting the Modified Energy Fitness ("MEF") program as one of the programs to be expanded in compliance with the Order in Case No 2012-005781 based on the partial Stipulation Agreement, considering that this program's kWh impact per participant is one of the lowest among Kentucky Power's residential DSM programs.
- b. The 2013 projected participants and program costs are 1,200 and \$450,660 respectively for the MEF program. The 2014 projected participants and program costs are 2,000 and \$838,689 respectively. Explain the cost differential per participant from 2013 to 2014.
- c. Explain whether there is an implementation contractor for this program, and if so, explain when that last contract was signed. If there was a revised contract recently, provide a copy.

RESPONSE

- a. The program was selected because it is cost-effective and offers valuable weatherization services to approximately 1,200 households per year. The program is administered by an implementation contractor that historically achieved customer participation targets. The implementation contractor confirmed that a higher level of customer participation was available on an annual basis under the present structure of the program. The net per participant savings is currently 651 kWh for this program representing approximately 5% of the total savings for the DSM Portfolio.
- b. The differential reflects the fact that the majority of evaluation expenses will be incurred in 2014. In addition, marketing and promotions will be increased in 2014 to support the expanded program goals.
- c. The implementation contractor is Honeywell, Inc. Attachment 1 to this response is a copy of the most recently signed contract, dated 12/31/2013. Confidential treatment is being sought for portions of KPSC 1-8, Attachment 1.

WITNESS: E J Clayton

ELEVENTH AMENDMENT TO SERVICE AGREEMENT NO. 714188X110

This Eleventh Amendment to Service Agreement No. 714188X110 ("Eleventh Amendment") executed to be effective as of the 31st day of December, 2013 ("Eleventh Amendment Effective Date"), is entered into by and between **Kentucky Power Company** ("Owner" or "AEP") and **Honeywell International, Inc.** ("Contractor").

WHEREAS, Contractor and Owner entered into Service Agreement No. 714188X110 (together with the amendments, the "Agreement") dated December 18, 2002, whereby Contractor is to provide certain Work as defined in the Agreement.

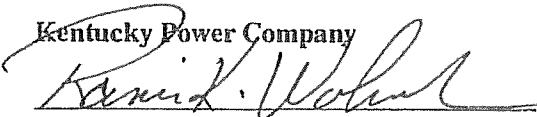
WHEREAS, Contractor and Owner desire to modify the terms and conditions of the Agreement as set forth below.

NOW THEREFORE, the parties hereto, hereby agree as follows:

1. The term of this Agreement is extended through December 31, 2014.
2. For 2014 there will be a Standard Offering consisting of [REDACTED] customer audits and an Extended Offering, which, upon written approval by Owner, increase the number of customer audits to [REDACTED]. Pricing for the Standard Offering and the Extended Offering shall be in accordance with Exhibit B.
3. Modify Exhibit B of the Agreement by deleting the Honeywell Utility Solutions Price Sheet dated December 23, 2011 ("Old Rates") and replacing with the attached Honeywell Utility Solutions Price Sheet ("New Rates") which are incorporated herein and shall be effective as of the Eleventh Amendment Effective Date.
4. Except as amended by this Eleventh Amendment, all provisions, terms and conditions of the Agreement shall remain in full force and effect.

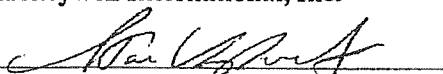
IN WITNESS WHEREOF, the parties hereto have caused this Eleventh Amendment to be signed by their respective representatives thereunto duly authorized on the dates set forth below to be effective as of the Eleventh Amendment Effective Date.

Kentucky Power Company


Ranie K. Wohnhas
Managing Director Regulatory & Finance

1/2/14
date

Honeywell International, Inc.


Name: Stan VanDermoot
Title: Senior Contracts Manager

December 18, 2013
date

Honeywell Utility Solutions Price Sheet
 Exhibit B

DESCRIPTION	MEASURE	COST	STANDARD OFFERING	EXTENDED OFFERING
			1200	800
operations	MONTHLY IT FEE			
admin	AUDIT SERVICES			
admin	BLOWER DOOR TEST			
admin	BLOWER DOOR TEST (Pre and Post)			
material	CAN FOAM (12.oz)			
material	CAULK (PER LINR FT)			
material	CFL 27 WATT			
material	CFL 23 WATT			
material	CFL 19 WATT			
material	CFL 14 WATT			
material	CFL 13 WATT			
material	CFL 3-WAY			
material	23W R-40 FLOOD			
material	16W R-30 FLOOD			
material	NEON NIGHT LIGHT			
material	DOOR SWEEP			
material	DUCT SEALING - ALUM GRIP TAPE			
material	DUCT SEALING - ALUM TAPE			
educ	EDUCATION BOOKLET			
material	DHW PIPE INSULATION- 1/2"			
material	DHW PIPE INSULATION- 3/4"			
material	SHOWERHEAD			
admin	PROGRAM ADMINISTRATION			
marketing	PROMOTION FEE			
material	SWITCH AND OUTLET GASKETS			
material	DHW TANK WRAP			
material	WEATHERSTRIP (PER LINR FT)			

Honeywell Utility Solutions Price Sheet
Exhibit B

Please note that Honeywell's pricing is the total, maximum, not-to-exceed authorized by AEP for the 2014 program year. Any potential conditions that would increase the cost or risk associated with the contract shall not be increased except by an executed written amendment by each party authorized representative. Based on the volume desired and frequencies seen in the program's history, our pricing reflects a not to exceed value of [REDACTED]. This would align with the average audit fee per home of [REDACTED]. The target expense for 2014 for 2000 audits would be [REDACTED] plus the IT fee and tax expense

The table contains 14 rows of redacted data, represented by solid black bars. The redaction covers the entire content of each row, obscuring any text or numbers that might have been present.



Kentucky Power Company

REQUEST

Refer to page 8 of the Status Report in the Application. The 2013 projected participants and program costs are 165 and \$251,366 respectively for the High Efficiency Heat Pump program. The 2014 projected participants and program costs are 165 and \$295,930 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The majority of the evaluation expenses will be incurred in 2014. In addition, radio advertising will be expanded in 2014.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 9 of the Status Report in the Application. The 2013 projected participants and program costs are 5,000 and \$57,073 respectively for the Community Outreach Compact Fluorescent Lamp program. The 2014 projected participants and program costs are 5,000 and \$65,511 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The differential reflects the fact that the majority of evaluation expenses will be incurred in 2014. In addition, the marketing and promotions budget increased in 2014. The increase was offset in part by a \$2,000 decrease in equipment expenses.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 10 of the Status Report in the Application. The 2013 projected participants and program costs are 2,200 and \$28,745 respectively for the Energy Education for Students program. The 2014 projected participants and program costs are 2,200 and \$36,688 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The cost differential reflects the fact that the majority of the programs evaluation expenses will be incurred in 2014.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 11 of the Status Report in the Application. The 2013 projected participants and program costs are 180 and \$23,817 respectively for the Energy Education for Students program. The 2014 projected participants and program costs are 240 and \$26,337 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The differential reflects the difference between the reduction in program incentives and dealer payments, as the majority of the evaluation expense will be incurred in 2014.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 13 of the Status Report in the Application.

- a. Explain the methodology used in selecting the Residential Efficient Products ("REP") program as one of the programs to be expanded in compliance with the Order in Case No 2012-00578 based on the partial Stipulation Agreement, considering that this program's kWh impact per participant is one of the lowest among Kentucky Power's residential DSM programs.
- b. The 2013 projected participants and program costs are 194,200 Energy Star Compact Fluorescent Lights ("CFL"), 24,000 Specialty Energy Star CFLs, and 400 Energy Star Light Emitting Diodes ("LED") and \$450,660 respectively for the REP program. The 2014 projected participants and program costs are 240,000 Energy Star CFLs, 20,000 Specialty Energy Star CFLs, and 4,500 Energy Star LEDs and \$450,660 respectively. Explain the participant and cost differential per participant from 2013 to 2014.
- c. Explain whether there is an implementation contractor for this program, and if so, explain when that last contract was signed. If there was a revised contract recently, provide a copy.
- d. Considering that incandescent light bulbs will no longer be manufactured in 2014, explain why Kentucky Power is putting so much emphasis on CFL bulbs, instead of higher-impact lighting such as LEDs.

RESPONSE

- a. Although per participant savings are lower than average, the high number of units delivered means the program provides 56% of the portfolios energy savings.
- b. The differential reflects the fact that the majority of the evaluation expenses will be incurred in 2014. In addition, incentive expenses and equipment/vendor expenses were increased to support expanding the program.

- c. The implementation contractor of the Residential Efficient Products program is Applied Proactive Technologies, Inc. Attachment 1 is a copy of the the most recent contract, dated January 1, 2014. Confidential treatment is being sought for portions of Attachment 1.
- d. CFL fixtures remain cost effective when compared to the more expensive LED fixture, and the real power savings is often minimal when comparing equivalent CFL and LED fixtures.

WITNESS: E J Clayton

SECOND AMENDMENT TO SERVICE AGREEMENT NO. 386994X110

This Second Amendment to Service Agreement No. 386994X110 ("Second Amendment") executed to be effective as of the 1st day of January, 2014 ("Second Amendment Effective Date"), is entered into by and between **Kentucky Power Company**, a Kentucky corporation ("Owner" or "KPCO") and **Applied Proactive Technologies, Inc.**, a Massachusetts corporation ("Contractor").

WHEREAS, Contractor and Owner entered into Service Agreement No. 386994X110 ("Agreement") with Effective Date of February 1, 2011 whereby Contractor is to act as implementation contractor for the Kentucky Power Company Residential Efficient Products Program

WHEREAS, Contractor and Owner desire to modify the terms and conditions of the Agreement as set forth below.

NOW THEREFORE, the Parties hereto, hereby agree as follows:

1. Section 5 Performance Metrics. Delete subsections i, ii and iii and replace with the following:

i. The total gross KWh Target Goal is:

2014 [REDACTED]
2015 [REDACTED]

ii. The total gross KW Target Goal is:

2014 [REDACTED]
2015 [REDACTED]

iii. Sales of energy efficient products Target Goal is:

Year	CFLs	LEDs
2014	260,000	4,500
2015	260,000	9,000

2. Section 6. Pricing and Payment Terms. Delete the second sentence in its entirety.
3. Incorporate the attached budget documents in Exhibit C, replacing all prior Budgets.
4. Except as amended by this Second Amendment, all provisions, terms and conditions of the Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have caused this Second Amendment to be signed by their respective officers thereunto duly authorized on the dates set forth below to be effective as of the Second Amendment Effective Date.

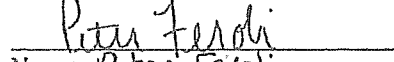
Kentucky Power Company



Gregory Pawley
President and COO

1/27/14
date

Applied Proactive Technologies, Inc.



Name: Peter Feoli
Title: Vice President

01/24/14
date

HIGH LEVEL BUDGET SUMMARY
 AEP Kentucky - Lighting Program
 January 1, 2014 - December 31, 2016

1

Cost Elements	Product Quantity				Total Program Product Quantity	Avg. Incentive Levels			Total 3 Year Program Budget
	2014	2015	2016	Total		2014	2015	2016	
	Product Quantity	Product Quantity	Product Quantity	Product Quantity		Total Costs	Total Costs	Total Costs	
INCENTIVE BUDGET									
Product Incentives									
CFLs									
Standard CFLs	240,000	240,000	240,000	720,000					
Specialty CFLs	20,000	20,000	0	40,000					
Total Retail Based CFLs	260,000	260,000	240,000	760,000					
LEDs									
Standard LEDs	4,500	9,000	20,000	33,500					
Specialty LEDs	0	0	0	0					
Total Retail Based LEDs	4,500	9,000	20,000	33,500					
Total Retail Based CFLs & LEDs	264,500	269,000	260,000	793,500					
Miscellaneous Bulb Distribution	0	0	0	0					
Community Events 23W 4pk (cost per bulb)	0	0	0	0					
Community Based Bulb Distribution	0	0	0	0					
Food Bank CFL Distribution 23W 4PK (cost per bulb)	0	0	0	0					
Fixtures									
LED Fixtures	0	0	0	0					
LED Holiday Lights	0	0	0	0					
LED Holiday Light Strings	0	0	0	0					
Total Lighting	264,500	269,000	260,000	793,500					
Non-Lighting Products									
Non-Lighting Products	0	0	0	0					
Compl. Cabinets	0	0	0	0					
Refrigerators	0	0	0	0					
Freezers	0	0	0	0					
Heat Pump Water Heaters	0	0	0	0					
Total Non-Lighting Products	0	0	0	0					
Total Product Incentives	264,500	269,000	260,000	793,500					

NON-INCENTIVE BUDGET	
AFT Flood Implementation	
EFL Incentive Processing	
Miscellaneous	
Total Non-Incentive Budget	
Grand Total Budget including Product Incentives	

	2014	2015	2016	Total
Incentive Percentage	52%	53%	52%	53%
Non-Incentive Percentage	48%	47%	48%	47%
Total Annual Savings Gross MWh				
Total Demand Savings MWh				
Total Annual Cost Per kWh (Gross)	\$0.0788	\$0.0843	\$0.0878	\$0.0835

Allocation of Dollars
 Total Savings
 Cost of Conserved Energy

Key Statistics!

2

Total Budget Summary
AEP Kentucky - Lighting Program
January 1, 2014 - December 31, 2016

Cost Elements	2014			2015			2016			Total Budget			Total 3 Year Program Budget
	Product Quantity	Product Quantity	Product Quantity	Product Quantity	Product Quantity	Product Quantity	Total	Total	Total	Total	Total		
Product Incentives													
CFLs	240,000	240,000	240,000	720,000			720,000						
Standard CFLs	20,000	20,000	20,000	60,000			60,000						
Specialty CFLs	220,000	220,000	220,000	660,000			660,000						
Total Retail Based CFLs	240,000	240,000	240,000	720,000			720,000						
LEDs	4,500	9,000	20,000	33,500			33,500						
Standard LEDs	0	0	0	0			0						
Specialty LEDs	4,500	9,000	20,000	33,500			33,500						
Total Retail Based LEDs	4,500	9,000	20,000	33,500			33,500						
Total Retail Based CFLs & LEDs	244,500	249,000	260,000	753,500			753,500						
Community Events 23W 4pk (cost per bulb)	0	0	0	0			0						
Food Bank CFL Distribution 23W 4PK (cost per bulb)	0	0	0	0			0						
LED Fixtures	0	0	0	0			0						
LED Holiday Light Straps	0	0	0	0			0						
Total Lighting	244,500	249,000	260,000	753,500			753,500						
Non-Lighting Products	0	0	0	0			0						
Room Air Conditioners	0	0	0	0			0						
Chairs/Tables	0	0	0	0			0						
Refrigerators	0	0	0	0			0						
Freezers	0	0	0	0			0						
Heat Pump Water Heaters	0	0	0	0			0						
Total Non Lighting	0	0	0	0			0						
Total Product Incentives	244,500	249,000	260,000	753,500			753,500						
EP Incentive Processing Budget													
Total Incentive Processing Budget													
AEP Program Field Implementation Budget													
Total Direct Labor	2014 Annual Hours	2015 Annual Hours	2016 Annual Hours	Total Annual Hours	2014 Hourly Rate	2015 Hourly Rate	2016 Hourly Rate	Total Hourly Rate	2014 Total Hours	2015 Total Hours	2016 Total Hours	Total Total Hours	Total 3 Year Program Budget
Administrative & Management Fee													
Total Labor													
General Program Expenses													
In-Store Marketing Materials													
Corp Travel													
Mileage, Parking and Tolls													
Mileage	50,000	50,000	50,000	150,000									
Parking													
Tolls													
Total Mileage, Parking and Tolls	50,000	50,000	50,000	150,000									
Miscellaneous													
Total AEP Program Field Implementation Budget													
Miscellaneous													
Total Field Implementation and Incentive Processing Budget													
Grand Total Budget Including Product Incentives													

Total Product Summary
AEP Kentucky - Lighting Program
January 1, 2014 - December 31, 2016

3

Cost Elements	Total Product Quantity				Average Incentive Levels			Total Budget			Total 3 Year Program Budget
	2014	2015	2016	Total All Years	2014	2015	2016	2014	2015	2016	
	Product Quantity	Product Quantity	Product Quantity	Product Quantity	Incentive Per Product	Incentive Per Product	Incentive Per Product	Total Costs	Total Costs	Total Costs	
CFLs											
Standard CFLs	240,000	240,000	240,000	720,000							
Specialty CFLs	20,000	20,000	0	40,000							
Total Retail Based CFLs	260,000	260,000	240,000	760,000							
LEDs											
Standard LEDs	4,500	9,000	20,000	33,500							
Specialty LEDs	0	0	0	0							
Total Retail Based LEDs	4,500	9,000	20,000	33,500							
Miscellaneous Bulb Distribution											
CFLs	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Community Events 23W 4pk (cost per bulb)	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Total Miscellaneous CFL Distribution	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Community Based Bulb Distribution											
CFLs	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Food Bank CFL Distribution 23W 4PK (cost per bulb)	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Total Community Based CFL Distribution	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Fixtures											
LED Fixtures	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Total Fixtures	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
LED Holiday Lights											
LED Holiday Light Strings	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Total LED Holiday Lights	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Non-Lighting Products											
Room Air Conditioners	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Clothes Washers	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Dehumidifiers	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Refrigerators	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Freezers	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Heat Pump Water Heaters	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Total Non Lighting	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0	\$0	\$0	\$0
Total All Products	264,500	269,000	240,000	793,500							

Confidential

APT Proposal

Annual Energy Savings Summary
 AEP Kentucky - Lighting Program
 January 1, 2014 - December 31, 2016

4

Measure	2014		2015		2016		TOTALS	
	Annual kWh Savings/Unit	Product Quantity	Annual kWh Savings/Unit	Product Quantity	Annual kWh Savings/Unit	Product Quantity	Average Annual kWh Savings/Unit	Total Annual Gross kWh Savings
Standard CFLs		240,000		240,000		240,000		720,000
Specialty CFLs		20,000		20,000		0		40,000
Standard LEDs		4,500		9,000		20,000		33,500
Specialty LEDs		0		0		0		0
Community Events 23W 4pk (cost per bulb)		0		0		0		0
Food Bank CFL Distribution 23W 4PK (cost per b)		0		0		0		0
LED Fixtures		0		0		0		0
LED Holiday Light Strings		0		0		0		0
Lighting Sub Total		284,500		269,000		260,000		783,500
Room Air Conditioners		0		0		0		0
Clothes Washers		0		0		0		0
Dehumidifiers		0		0		0		0
Refrigerators		0		0		0		0
Freezers		0		0		0		0
Heat Pump Water Heaters		0		0		0		0
Appliance Sub Total		0		0		0		0
ANNUAL SAVINGS TOTALS		284,500		269,000		260,000		783,500

Confidential

APT Proposal



Kentucky Power Company

REQUEST

Refer to page 17 of the Status Report in the Application. The 2013 projected participants and program costs are 15 and \$6,931 respectively for the Commercial HVAC Diagnostic and Tune-Up program. The 2014 projected participants and program costs are 24 and \$11,181 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The differential reflects the fact that the majority of evaluation expenses will be incurred in 2014. This increase is offset in part by decreases in equipment/vendor payments and marketing expenses to match participation targets.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 19 of the Status Report in the Application. The 2013 projected participants and program costs are one central air condition and 12 heat pumps and \$6,931 respectively for the Commercial High Efficiency HP/AC program. The 2014 projected participants and program costs are five central air conditions and 10 heat pumps and \$17,731 respectively. Explain the cost differential per participant from 2013 to 2014.

RESPONSE

The differential reflects the fact that the majority of evaluation expenses will be incurred in 2014. This increase is offset in part by a decrease in marketing expense to align with participant goals.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Refer to page 20 of the Status Report in the Application.

- a. Explain the methodology used in selecting the Commercial Incentives ("CI") program as one of the programs to be expanded in compliance with the Order in Case No 2012-00578 based on the partial Stipulation Agreement.
- b. The 2013 projected participants and program costs are 150 and \$1,012,067 respectively for the CI program. The 2014 projected participants and program costs are 250 and \$1,459,838 respectively. Explain the cost differential per participant from 2013 to 2014.
- c. Explain whether there is an implementation contractor for this program, and if so, explain when that last contract was signed. If there was a revised contract recently, provide a copy.
- d. Explain why the promotion costs are only \$794, considering the program impacts that can be achieved for this program.

RESPONSE

- a. The program was selected because it provides comprehensive benefits to the commercial customer on custom, prescriptive, new construction, and direct install (small commercial) projects. The implementation contractor confirmed a higher level of customer participation was available on an annual basis under the present program structure.
- b. The differential reflects an increase in the projected number of participants and decrease in customer incentive because of the smaller average project size. These are partially offset by an increase in 2014 evaluation expense, equipment/vendor expense, and promotion and marketing to support increases in participation levels.
- c. The implementation contractor for the Commercial Incentive Program is KEMA Services, Inc. Attachment 1 is a copy of the most recent contract revision (unsigned as of this date). Attachment 2 is a copy of the budget information for the program. The Company is seeking confidential treatment for portions of Attachments 1 and 2.

- d. Most of the promotional expenses for the program are the vendor's promotional expenses which are included in the administrative costs. In addition to the vendor's promotion expense, Kentucky Power's promotional expenses were increased to \$6,906.00 for the second half of 2013.

WITNESS: E J Clayton

SECOND AMENDMENT TO CONTRACT NO. 382707X110

This Second Amendment to Contract No. 382707X110 ("Second Amendment") executed to be effective as of the 1st day of January, 2014 ("Second Amendment Effective Date"), is entered into by and between **Kentucky Power Company**, a Kentucky corporation ("Owner" or "KPCO") and **Kema Services, Inc.**, a Massachusetts corporation ("Consultant" or "DNV Kema").

WHEREAS, Consultant and Owner entered into Contract No. 382707X110 ("Contract") with Effective Date of February 1, 2011 whereby Contractor is to perform certain Services as defined in the Contract.

WHEREAS, Consultant and Owner desire to modify the terms and conditions of the Contract as set forth below.

NOW THEREFORE, the Parties hereto, hereby agree as follows:

1. In Exhibit B to the Contract, amend the Goal Projections by year – Base Range table on page 2 to increase the Target customers to 250 for 2014 and 2015.
2. In Exhibit B to the Contract, amend the Goal Projections by year – Base Range table on page 2 to increase the Annual Energy (MWh) Reduction to 6250 for 2014 and 2015.
3. In Exhibit B to the Contract, amend the 2014 & 2015 Goal projections by Program Element on page 3 by deleting the number of Target Participants for each Program Element and replacing with the following:

Pres/ Cust.	187
New Const.	4
DI	59
Total	250

4. In Exhibit B to the Contract, amend the 2014 & 2015 Goal projections by Program Element on page 3 by deleting the number for Annual Energy (MWh) Reduction for each Program Element and replacing with the following:

Pres/ Cust.	1
New Const.	1
DI	1
Total	1

5. In Exhibit C to the Contract, incorporate the attached 2014 and 2015 budgets ("New 2014/2015 Budget") replacing all references to a 2014 / 2015 budget currently in Exhibit C ("Old 2014 / 2015 Budget") to be effective as of the Second Amendment Effective Date.
6. Except as amended by this Second Amendment, all provisions, terms and conditions of the Contract shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have caused this Second Amendment to be signed by their respective representatives thereunto duly authorized on the dates set forth below to be effective as of the Second Amendment Effective Date.

Kentucky Power Company

Kema Services, Inc.

Gregory Pauley
President & COO

Name:
Title:

date

date

2015

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Budget/Goal
Incentives Paid	\$27,000.00	\$27,000.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$81,000.00	\$81,000.00	\$108,000.00	\$108,000.00	\$675,000.00
CI	8	8	11	11	11	11	11	11	22	22	31	30	187
New Construction			1										
DI	2	2	3	4	4	3	4	4	7	8	9	9	4
Number of Apps Paid	10	10	15	15	15	15	15	15	30	30	40	40	250
MWH Paid	250.00	250.00	375.00	375.00	375.00	375.00	375.00	375.00	750.00	750.00	1000.00	1000.00	6250.00
Marketing													
Program Imp													
Education													
Labor and Expenses Paid													

Assumptions:

4 direct mail pieces

25 MWH per application

2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Budget/Goal
Incentives Paid	\$27,000.00	\$27,000.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$40,500.00	\$81,000.00	\$81,000.00	\$108,000.00	\$108,000.00	\$675,000.00
CI	8	8	11	11	11	11	11	11	22	22	31	30	187
New Construction			1			1			1				1
DI	2	2	3	4	4	3	4	4	7	8	9	9	59
Number of Apps Paid	10	10	15	15	15	15	15	15	30	30	40	40	250
MWH Paid	250.00	250.00	375.00	375.00	375.00	375.00	375.00	375.00	750.00	750.00	1000.00	1000.00	6250.00
Marketing Program Imp													
Education													
Labor and Expenses Paid													

Assumptions:

4 direct mail pieces

25 MWH per application



Kentucky Power Company

REQUEST

- a. Explain whether the DSM programs selected to be expanded in compliance with the Order in Case No 2012-005784 based on the partial Stipulation Agreement are cost-effective.
- b. If the programs are not currently cost-effective, explain the impact as to the programs' cost-effectiveness of expanding these programs.
- c. By program, provide the current cost-effectiveness test results of the DSM programs before and after the programs have been expanded.

RESPONSE

- a. Yes.
- b. N/A
- c. The programs prospective Total Resource Cost (TRC) test results are summarized in Attachment 1. An evaluation that specifically has the expanded program target levels is not available.

WITNESS: E J Clayton

Prospective Total Resource Cost Test from 2011 and 2012
Program Evaluations:

	Total Resource Cost
	<u>TRC</u>
<u>Program - Residential</u>	
Targeted Energy Efficiency	1.95
Mobile Home High Efficiency Heat Pump	6.41
Mobile Home New Construction	2.64
Modified Energy Efficiency	1.37
High Efficiency Heat Pump	2.03
Community Outreach CFL	3.91
Energy Education for Students	1.65
HVAC Diagnostic and Tune-up - Residential	1.03
Residential Efficient Products	2.39
<u>Program - Commercial</u>	
HVAC Diagnostic and Tune-up - Commercial	1.1
Small Commercial Heat Pump/Air Conditioner	1.18
Commercial Incentive	1.09



Kentucky Power Company

REQUEST

On page 2 of Exhibit H-1, Prepared Testimony of Virginia Carol Wright, of the Application in Case No. 2013-002195 states:

- a. Explain whether Kentucky Power has ever considered a Prepay Meter Program as an energy-conservation program, and even implementing this program to replace DSM programs that are not cost-effective.
- b. Provide what portion of customer-services costs are incurred as to disconnect and reconnect fees and applying late-fee charges.

Since the inception of the Prepay Program in June 2011, the members participating in the program have an average of 16% reduction in kWh usage. As we have passed the second year anniversary of the program, this percentage reduction in kWh usage has dropped to 9.5%. However, all Prepay members continue to avoid late fee charges, disconnect and reconnect fees, and are not required to pay a deposit.

The Prepay Program has been a success and our members are very satisfied with the program. Jackson Energy currently has over 3,000 members enrolled in this program and it continues to grow. As a true conservation program, Prepay has contributed to lower kWh sales. Jackson Energy Prepay members use an average of 171 kWh less per month. With 3,000 members currently enrolled, this is approximately 513,000 kWh less sales per month and could possibly equate to approximately \$600,000 less revenue per year.

RESPONSE

- a. Kentucky Power has reviewed prepay metering and has decided it is not in the best interest of the company's customers at this time. Current deployment configurations for prepay metering systems typically require the functionality of smart meter technology infrastructure to provide the two way communications capability necessary to track customer electricity usage levels and credit meters with payments. Kentucky Power's AMR metering lacks such capability. The infrastructure necessary to support such communications is not only expensive, but would require the early retirement of the current AMR metering.
- b. During 2013, approximately 7.4% of customer service costs were incurred for disconnect and reconnect trips. Late-fee charges are added automatically by computer programming and thus no ongoing charges are incurred.

WITNESS: Ranie K Wohnhas



Kentucky Power Company

REQUEST

Explain why the 2013 budget in Case No 2013-00138 was reduced in the current application of this filing.

RESPONSE

The 2013 budget was reduced to ensure the DSM surcharge proposed with this DSM filing reflects the most recent actual program data.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

Explain why there are no industrial programs and customers as part of Kentucky Power's DSM Collaborative and portfolio.

RESPONSE

Kentucky Industrial Utility Customers participated during the early development of the Kentucky Power DSM Collaborative and proposed an opt-out recommendation for the group members. The DSM factor for industrial customers was stopped for the industrial sector bills beginning January 2000 following the entry of the Order dated September 28, 1999 in Case No. 95-427. The Company has not re-established DSM programs for the industrial customer sector because of the lack of interest.

WITNESS: E J Clayton



Kentucky Power Company

REQUEST

- a. Provide a revised Status Report and Exhibit C that includes actual numbers for the second half of 2013.
- b. Provide in electronic format, with formulas intact and cells unprotected, a revised Status Report and Exhibit C that include actual numbers for the second half of 2013.

RESPONSE

- a. Please see Attachments 1 & 2 to this response.
- b. Please see enclosed CD.

WITNESS: Ranie K Wohnhas

KENTUCKY POWER COMPANY
Demand Side Management
Status Report
As of December 31, 2013

INDEX

PAGE	DESCRIPTION
1	Definitions
2	Summary Information (All Programs)
3	Summary Energy/Demand Information (All Programs)
<u>DSM Programs:</u>	
Residential Programs	
4	Targeted Energy Efficiency
5	High Efficiency Heat Pump - Mobile Home
6	Mobile Home New Construction
7	Modified Energy Fitness Program
8	High Efficiency Heat Pump
9	Community Outreach Compact Fluorescent Lamp (CFL)
10	Energy Education for Students
11	Residential HVAC Diagnostic and Tune-up
12	Pilot Residential Load Management
13	Residential Efficient Products
14	Energy Fitness - Inactive
15	Compact Fluorescent Bulb - Inactive
16	High Efficiency Heat Pump Retrofit - Inactive
Commercial Programs	
17	Commercial HVAC Diagnostic and Tune-up
18	Pilot Commercial Load Management
19	High Efficiency Heat Pump/Air Conditioner
20	Commercial Incentive
21	Smart Audit - Inactive
22	Smart Incentive - Inactive
Industrial Programs	
23	Smart Audit - Inactive
24	Smart Incentive - Inactive

DEFINITIONS

- 1) YTD Costs - Year-to-Date costs recorded through December 31, 2013.
- 2) YTD Impacts - Estimated in place load impacts for Year-to-Date participants.
- 3) PTD Costs - Costs recorded from the inception of the program through December 31, 2013
- 4) PTD Impacts - Estimated in place load impacts for Program-to-Date participants.

COMMENTS

Our calculations are based on actual participants and costs as of December 31, 2013. The Residential DSM costs in this status report do not agree with the total costs in the Financial Report due to a one month lag in reporting.

The estimated actual in-place energy (kWh) savings is the summation of the monthly average net energy savings associated with participating customers of each DSM program (including T&D losses). The average monthly net energy savings is the product of 1/12 of the annual kWh per participant (shown in Exhibit E) and 1/2 of the new participants for the current month, plus the cumulative participants from the previous months. The average monthly net energy savings is then increased by 10% to include T&D losses. The estimated actual in-place energy (kWh) savings are calculated in accordance with the Sunset Provision contained in the joint application, filed September 27, 1995.

The estimated anticipated peak demand (kW) reduction is a product of the number of net participating customers (excluding free riders) and projected winter/summer demand reductions filed for each program (refer to Section III to V of the joint application). The anticipated peak demand (kW) reductions includes 11% T&D loss savings.

The calculation of YTD and PTD estimated in place energy (kWh) savings and anticipated peak demand (kW) reductions contained in this status report reflect, wherever applicable, the program evaluation results of each individual program as described in the August 16, 1999, June 30, 2002, June 30, 2005, June 30, 2008, June 30, 2010, August 15, 2011 and August 15, 2012 DSM collaborative report.

The individual DSM lost revenue, efficiency incentive and maximizing incentives as of June 30, 1997 are calculated based on the initial values from Exhibit E in the joint application, filed September 27, 1995. A retroactive adjustment of the initial values of the efficiency incentives and net lost revenue KWH impacts was used for each program for the first eighteen months (1/1/96 to 6/30/97). The lost revenue, efficiency incentive and maximizing incentive for the period 1/1/2012 to 12/31/2012 are calculated using the revised values contained in Schedule C of this status report.

The program lost revenue is the product of the number of participating customers, the average net energy savings (kWh) per customer and the net lost revenue (\$/kWh). The number of participating customers is equal to 1/2 of the new participants for the current month, plus the cumulative participants from the previous months. The program-to-date lost revenues are calculated in accordance with the Sunset Provision contained in the joint application, filed September 27, 1995.

The efficiency incentive is the product of the number of participants for the month and the efficiency rate (\$/participant). The maximizing incentive is calculated as 5% of actual program cost for the month.

KENTUCKY POWER COMPANY
SUMMARY INFORMATION (ALL PROGRAMS)
 As of December 31, 2013

DESCRIPTION	YTD	PTD
Total Revenue Collected	<u>\$4,062,428</u>	<u>\$27,299,102</u>
Total Program Costs	2,601,951	19,653,621
Total Lost Revenues	897,456	5,592,346
Total Efficiency / Maximizing Incentive	401,331	2,207,472
HEAP - Kentucky Power's Information Technology Implementation Costs (Case No 2006 - 00373, Dated December 14, 2006)	0	58,968
HEAP - KACA's Information Technology Implementation Costs	<u>0</u>	<u>15,700</u>
Total DSM Costs As of December 31, 2013	<u>\$3,900,738</u>	<u>\$27,528,107</u>

KENTUCKY POWER COMPANY
SUMMARY INFORMATION (ALL PROGRAMS)
As of December 31, 2013

DESCRIPTION	YTD		PTD	
Actual In-Place Energy Savings:	8,514,237	kWh	601,403,548	kWh
w/ T&D Line Losses:	9,365,661	kWh	661,543,903	kWh
Total kW Reductions:				
Winter	3,141	kW	31,700	kW
w/ T&D Line Losses:	3,487	kW	35,187	kW
Summer	2,672	kW	10,732	kW
w/ T&D Line Losses:	2,966	kW	11,912	kW

PROGRAM INFORMATION	
PROGRAM:	Targeted Energy Efficiency
PARTICIPANT DEFINITION:	Number of Households
CUSTOMER SECTOR:	Residential - Low Income
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	<u>All Electric</u>	<u>Non All Electric</u>
Jan	4	1
Feb	7	0
Mar	11	2
Apr	11	2
May	9	3
Jun	6	3
Jul	8	2
Aug	11	0
Sep	13	2
Oct	14	0
Nov	10	1
Dec	9	1
YTD	113	17
PTD	3,619	1,116

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	123,059	90,136,320
Anticipated Peak Demand (kW) Reduction:		
Summer	39	836
Winter	67	3,245

<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive</u>	
		<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$3,974	\$0	\$277,658
Equipment/Vendor:	\$137,674	\$0	\$3,835,246
Promotional:	\$0	\$0	\$0
Customer Incentives:	\$0	\$0	\$0
Other Costs:	\$0	\$0	\$9,553
Total Program Costs	\$141,648	\$0	\$4,122,457
Lost Revenues:	\$60,950	\$1,944	\$914,212
Efficiency Incentive:	\$12,112	\$184	\$152,677
Maximizing Incentive:	\$113	\$0	\$123,617
Total Costs	\$214,823	\$2,128	\$5,312,963

COMMENTS:

The Targeted Energy Efficiency Program provides a variety of services, including a home energy audit, weatherization and seal-up to targeted low income customers.

The Equipment / Vendor cost categories includes the cost of labor and materials of measures installed, participant energy education costs and vendor administration costs. The YTD costs are \$61,912 for all-electric and \$909 for non-all-electric homes.

The YTD Estimated in Place Energy (kWh) Savings for all-electric participants and non-all-electric participants is 26,078 and 1,881 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for all-electric and non-all-electric participants is 13/24 and 2/1 respectively.

The YTD Lost Revenue for all-electric participants and non-all-electric participants is \$32,711 and \$1,933 respectively.

The YTD Efficiency Incentive for all-electric participants is \$5,145.
 The YTD Maximizing Incentive for non-all-electric participants is \$45.

The participant and expense forecast for 2013 is 110 all-electric homes, 20 non-all-electric homes and \$153,909. The participant and expense forecast for 2014 is 145 all-electric homes, 20 non-all-electric homes and \$220,891.

PROGRAM INFORMATION	
PROGRAM:	High Efficiency Heat Pump - Mobile Home
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	
Jan	5
Feb	11
Mar	14
Apr	25
May	23
Jun	18
Jul	19
Aug	28
Sep	14
Oct	14
Nov	14
Dec	5
YTD	190
PTD	2,900

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	288,406	88,156,709
Anticipated Peak Demand (kW) Reduction:		
Summer	97	649
Winter	160	4,439

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$2,533	\$0	\$55,089
Equipment/Vendor:	\$9,600	\$0	\$96,355
Promotional:	\$1,553	\$0	\$1,553
Customer Incentives:	\$78,000	\$0	\$1,225,200
Other Costs:	\$0	\$0	\$1,167
Total Program Costs	\$91,686	\$0	\$1,379,364
Lost Revenues:			
Efficiency Incentive:	\$97,529	\$5,820	\$711,291
Maximizing Incentive:	\$44,983	\$18,331	\$344,056
	\$0	\$0	\$0
Total Costs	\$234,198	\$24,151	\$2,434,711

COMMENTS:

The High Efficiency Heat Pump - Mobile Home program provides incentives to customers, encouraging them to install the highest efficiency equipment practical.

The participant and expense forecast for 2014 is 220 and \$114,098 respectively.

PROGRAM INFORMATION	
PROGRAM:	Mobile Home New Construction
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	5	0
Feb	11	0
Mar	9	0
Apr	15	0
May	10	0
Jun	17	0
Jul	16	0
Aug	11	0
Sep	11	0
Oct	8	0
Nov	9	0
Dec	4	0
YTD	126	0
PTD	2,586	2

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	128,943	128,446,558
Anticipated Peak Demand (kW) Reduction:		
Summer	64	825
Winter	14	5,161

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$2,395	\$0	\$38,924
Equipment/Vendor:	\$6,550	\$0	\$152,063
Promotional:	\$0	\$0	\$4,189
Customer Incentives:	\$65,500	\$0	\$1,302,450
Other Costs:	\$250	\$0	\$5,116
Total Program Costs	\$74,695	\$0	\$1,502,742
Lost Revenues:	\$52,264	\$0	\$665,567
Efficiency Incentive:	\$10,453	\$0	\$196,131
Maximizing Incentive:	\$0	\$0	\$2,580
Total Costs	\$137,412	\$0	\$2,367,020

COMMENTS:

The Collaborative has devised and implemented a plan in conjunction with trade allies to offer a financial incentive to new mobile home buyers and trade allies to encourage the installation of high efficiency heat pumps and upgraded insulation packages in new mobile homes.

The participant and expense forecast for 2014 is 155 heat pumps and \$98,872 respectively.

PROGRAM INFORMATION	
PROGRAM:	Modified Energy Fitness
PARTICIPANT DEFINITION:	Number of Home Audits
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	
Jan	109
Feb	104
Mar	93
Apr	103
May	90
Jun	99
Jul	103
Aug	101
Sep	104
Oct	123
Nov	102
Dec	69
YTD	1,200
PTD	10,591

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	468,609	83,068,610
Anticipated Peak Demand (kW) Reduction:		
Summer	200	1,178
Winter	320	5,029

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$7,007	\$0	\$43,335
Equipment/Vendor:	\$456,909	\$0	\$3,866,198
Promotional:	\$2,342	\$0	\$2,342
Customer Incentives:	\$0	\$0	\$0
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$466,257	\$0	\$3,911,874
Lost Revenues:	\$136,748	\$0	\$993,542
Efficiency Incentive:	\$7,644	\$0	\$323,429
Maximizing Incentive:	\$0	\$0	\$0
Total Costs	\$610,649	\$0	\$5,228,845

COMMENTS:

The Modified Energy Fitness program provides energy audits, blower door testing, duct sealing and direct installation of low cost conservation measures to residential customers with electric space heating and electric water heating.

The equipment / vendor cost category includes the cost of labor and materials of measures installed, the cost of promotion by the vendor and vendor administration costs including customer education.

The participants and expense forecast for 2014 is 2,000 and \$838,689 respectively.

PROGRAM INFORMATION	
PROGRAM:	High Efficiency Heat Pumps
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	<u>Resistance</u>	<u>Non Resistance</u>
Jan	17	35
Feb	14	18
Mar	18	21
Apr	6	45
May	18	44
Jun	11	44
Jul	10	35
Aug	12	31
Sep	16	28
Oct	19	24
Nov	15	25
Dec	18	28
YTD	174	378
PTD	953	1,936

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	517,627	3,235,912
Anticipated Peak Demand (kW) Reduction:		
Summer	-63	40
Winter	332	2,591

Costs	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Description			
Total Evaluation	\$3,981	\$0	\$16,217
Equipment/Vendor:	\$27,350	\$0	\$168,350
Promotional:	\$178	\$0	\$178
Customer Incentives:	\$219,260	\$0	\$1,118,560
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$250,769	\$0	\$1,303,305
Lost Revenues:	\$117,123	\$0	\$332,771
Efficiency Incentive:	\$40,314	\$0	\$317,781
Maximizing Incentive:	\$0	\$0	\$17,177
Total Costs	\$408,206	\$0	\$1,971,034

COMMENTS:

This program was implemented to reduce residential electric consumption by replacing older, less efficient electric heating systems with high efficiency heat pumps. Customers are provided an incentive encouraging them to promote the highest efficiency equipment practical.

The YTD Estimated in Place Energy (kWh) Savings for resistance heat replacement and non-resistance heat replacement participants is 48,096 and 75,102 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for resistance heat replacement and non-resistance heat replacement participants is -12/-4 and 44/115 respectively.

The YTD Lost Revenue for resistance heat replacement and non-resistance heat replacement participants is \$15,626 and \$28,538 respectively.

The Efficiency Incentive for resistance heat replacement participants is \$3,301 and for the non-resistance heat replacement participants is \$18,332.

The participant and expense forecast for 2013 is 165 resistance heat replacement customers, 385 non-resistance heat replacement customers and \$251,366 respectively.

The participant and expense forecast for 2014 is 165 resistance heat replacement customers, 430 non-resistance heat replacement customers and \$295,930 respectively.

PROGRAM INFORMATION	
PROGRAM:	Community Outreach Compact Fluorescent Lamp
PARTICIPANT DEFINITION:	Number of Customers
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	
Jan	0
Feb	0
Mar	813
Apr	0
May	1,096
Jun	382
Jul	479
Aug	573
Sep	581
Oct	982
Nov	110
Dec	0
YTD	5,016
PTD	24,126

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	642,295	2,339,088
Anticipated Peak Demand (kW) Reduction:		
Summer	292	915
Winter	272	1,062

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$2,135	\$0	\$20,550
Equipment/Vendor:	\$55,482	\$0	\$224,468
Promotional:	\$78	\$0	\$16,580
Administration:	\$109	\$0	\$2,405
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$57,804	\$0	\$264,003
Lost Revenues:			
Efficiency Incentive:	\$77,097	\$0	\$226,823
Maximizing Incentive:	\$23,926	\$0	\$112,791
Other:	\$0	\$0	\$0
Total Costs	\$158,827	\$0	\$603,617

COMMENTS:

The Community Outreach Compact Fluorescent Lighting (CFL) program is designed to educate and influence residential customers to purchase and use compact fluorescent lighting in their homes. A package of 4 high efficiency CFLs are distributed to customers at scheduled community outreach events.

The participant and expense forecast for 2014 is 5,000 customers and \$65,511 respectively.

PROGRAM INFORMATION	
PROGRAM:	Energy Education For Students
PARTICIPANT DEFINITION:	Number of Students receiving EE kits
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	
Jan	0
Feb	159
Mar	216
Apr	214
May	0
Jun	0
Jul	0
Aug	0
Sep	0
Oct	405
Nov	601
Dec	635
YTD	2,230
PTD	8,890

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	208,233	698,530
Anticipated Peak Demand (kW) Reduction:		
Summer	133	374
Winter	82	283

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$1,887	\$0	\$12,148
Equipment/Vendor:	\$20,537	\$0	\$82,739
Promotional:	\$928	\$0	\$1,928
Education Workshops	\$3,000	\$0	\$19,142
Administration	\$3,000	\$0	\$13,562
Total Program Costs	\$29,352	\$0	\$129,519
Lost Revenues:	\$28,196	\$0	\$87,394
Efficiency Incentive:	\$7,069	\$0	\$30,277
Maximizing Incentive:	\$0	\$0	\$0
Total Costs	\$64,617	\$0	\$247,190

COMMENTS:

The Energy Education for Students program is designed to partner with the National Energy Education Development Project (NEED) to implement an energy education program for 7th grade students at participating middle schools. The students will be provided a package of four 23 watt CFLs to install in their homes. The program will influence residential customers to purchase and use compact fluorescent lighting in their homes.

The participant and expense forecast for 2013 is 2,200 students and \$28,745 respectively.

The participant and expense forecast for 2014 is 2,200 students and \$36,688 respectively.

PROGRAM INFORMATION	
PROGRAM:	Residential HVAC Diagnostic and Tune-up
PARTICIPANT DEFINITION:	Number of Units receiving service
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	10	0
Feb	9	0
Mar	31	0
Apr	12	0
May	6	0
Jun	1	0
Jul	0	0
Aug	5	0
Sep	18	0
Oct	50	0
Nov	8	0
Dec	6	0
YTD	156	0
PTD	1,696	454

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	83,649	528,898
Anticipated Peak Demand (kW) Reduction:		
Summer	8	249
Winter	35	395

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$2,311	\$0	\$19,088
Equipment/Vendor:	\$8,400	\$0	\$103,500
Promotional:	\$3,028	\$0	\$12,562
Customer Incentives:	\$9,020	\$0	\$104,070
Administration:	\$0	\$0	\$0
Other Costs:	\$0	\$0	\$50
Total Program Costs	\$22,759	\$0	\$239,270
Lost Revenues:	\$9,989	\$1,944	\$27,243
Efficiency Incentive:	\$0	\$184	\$8,930
Maximizing Incentive:	\$1,138	\$0	\$6,811
Total Costs	\$33,886	\$2,128	\$282,254

COMMENTS:

The Residential HVAC Diagnostic and Tune-up Program provides incentives to customers for a variety of HVAC services including over and under refrigerant charge and other diagnostic performance checks on residential unitary central air conditioning and heat pump units. In 2013 Customer incentives are reduced to \$30 from \$50 and Dealer incentives are reduced to \$25 from \$50.

The YTD Estimated in Place Energy (kWh) Savings for heat pump and air conditioner participants is 33,226 and 104 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for heat pump and air conditioner participants is 8/32 and 0/0 respectively.

The YTD Lost Revenue for heat pump and air conditioner participants is \$3,979 and \$248 respectively.

The Maximizing Incentive for heat pump participants is \$633 and for air conditioner participants is \$10.

The participant and expense forecast for 2013 is zero central air conditioners and 180 heat pumps and \$23,817 respectively.

The participant and expense forecast for 2014 is zero central air conditioners and 240 heat pumps and \$26,337 respectively.

PROGRAM INFORMATION	
PROGRAM:	Pilot Residential Load Management
PARTICIPANT DEFINITION:	Number of Switches Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	<u>A/C Switches</u>	<u>Water Heater SW</u>
Jan		
Feb		
Mar		
Apr		
May		
Jun		
Jul		
Aug		
Sep		
Oct		
Nov		
Dec		
YTD	0	0
PTD	65	52

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive</u>	
		<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$0	\$0	\$31,060
Equipment/Vendor:	\$19,940	\$0	\$293,463
Promotional:	\$0	\$0	\$12,192
Customer Incentives:	\$1,096	\$0	\$1,516
Other Costs:	\$0	\$0	\$696
Total Program Costs	\$21,036	\$0	\$338,927
Lost Revenues:	\$0	\$0	\$0
Efficiency Incentive:	\$0	\$0	\$0
Maximizing Incentive:	\$0	\$0	\$0
Total Costs	\$21,036	\$0	\$338,927

COMMENTS:

The Pilot Residential Load Management Program will determine whether peak demand can be effectively reduced through the installation of load control devices on central air conditioners, heat pumps, and/or electric water heaters. The program was completed December 31, 2012.

The participant and expense forecast for 2013 - 2014 is 0 air conditioners or heat pumps switches and 0 water heating switches. There is no program expenses forecast since the program was completed December 31, 2012.

The participant forecast for 2013 is zero A/C switches and zero water heating switches. The 2013 expenses forecast to complete the program is \$21,036.

PROGRAM INFORMATION	
PROGRAM:	Residential Efficient Products
PARTICIPANT DEFINITION:	Number of Units purchased
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants			
	<u>CFL</u>	<u>Specialty Bulbs</u>	<u>LED Lights</u>
Jan	19,222	1,648	0
Feb	26,176	2,130	0
Mar	27,682	2,520	0
Apr	14,243	3,123	0
May	7,043	1,527	0
Jun	6,483	1,604	0
Jul	15,662	2,626	0
Aug	3,556	943	0
Sep	8,230	2,004	0
Oct	21,981	1,679	48
Nov	31,327	1,811	56
Dec	25,160	3,763	11
YTD	206,765	25,378	115
PTD	476,676	25,378	127

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	5,227,247	10,029,545
Anticipated Peak Demand (kW) Reduction:		
Summer	1,289	2,193
Winter	1,289	3,529

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$5,330	\$0	\$34,656
Equipment/Vendor:	\$236,315	\$0	\$593,697
Promotional:	\$582	\$0	\$582
Customer Incentives:	\$235,907	\$0	\$518,361
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$478,134	\$0	\$1,147,296
Lost Revenues:	\$246,022	\$0	\$368,494
Efficiency Incentive:	\$205,189	\$0	\$362,420
Maximizing Incentive:	\$74	\$0	\$133
Total Costs	\$929,419	\$0	\$1,878,343

COMMENTS:

The Residential Efficient Products Program will provide incentives and marketing support through retailers to build market share and usage of ENERGY STAR lighting products. Designed to produce long-term energy savings in the residential sector by increasing the market share of ENERGY STAR CFLs and (or) other ENERGY STAR lighting products.

The participant and expense forecast for 2013 is 194,200 ENERGY STAR CFLs and 24,000 Specialty ENERGY STAR CFLs, 400 ENERGY STAR LEDs and \$492,851 respectively.

The participant and expense forecast for 2014 is 240,000 ENERGY STAR CFLs and 20,000 Specialty ENERGY STAR CFLs, 4,500 ENERGY STAR LEDs and \$843,940 respectively.

PROGRAM INFORMATION	
PROGRAM:	Energy Fitness - Inactive
PARTICIPANT DEFINITION:	Number of Households
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	2,812

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	55,360,221
Anticipated Peak Demand (kW) Reduction:		
Summer	0	441
Winter	0	1,932

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	18,189.00
Equipment/Vendor:	0.00	0.00	665,964.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	960.00
Total Program Costs	0.00	0.00	685,113.00
Lost Revenues:	0.00	(19,322.00)	363,029.00
Efficiency Incentive:	0.00	(46,349.00)	63,482.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	0.00	(65,671.00)	1,111,624.00

COMMENTS:

This program was discontinued May 14, 1999.

PROGRAM INFORMATION	
PROGRAM:	Compact Fluorescent Bulb - Inactive
PARTICIPANT DEFINITION:	Number of Bulbs Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	
Jan	0
Feb	0
Mar	0
Apr	0
May	0
Jun	0
Jul	0
Aug	0
Sep	0
Oct	0
Nov	0
Dec	0
YTD	0
PTD	269

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	280,416
Anticipated Peak Demand (kW) Reduction:		
Summer	0	3
Winter	0	3

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive</u>	
		<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	60.00
Equipment/Vendor:	0.00	0.00	15,021.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	0.00	0.00	15,081.00
Lost Revenues:	0.00	25.00	1,605.00
Efficiency Incentive:	0.00	8.00	433.00
Maximizing Incentive:	0.00	0.00	0.00
Total Costs	0.00	33.00	17,119.00

COMMENTS:

This program was discontinued December 31, 1996

PROGRAM INFORMATION	
PROGRAM:	High Efficiency Heat Pumps Retro - Inactive
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Residential
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>Resistance</u>	<u>Non Resistance</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	1,367	929

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	71,026,985
Anticipated Peak Demand (kW) Reduction:		
Summer	0	851
Winter	0	2,995

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive</u>	
		<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	12,885.00
Equipment/Vendor:	0.00	0.00	129,767.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	70,500.00
Other Costs:	0.00	0.00	1,160.00
Total Program Costs	0.00	0.00	214,312.00
Lost Revenues:	0.00	(269.00)	368,960.00
Efficiency Incentive:	0.00	(2,196.00)	48,017.00
Maximizing Incentive:	0.00	0.00	5.00
Total Costs	0.00	(2,465.00)	631,294.00

COMMENTS:

This program was discontinued December 31, 2001.

PROGRAM INFORMATION	
PROGRAM:	Commercial HVAC Diagnostic and Tune-up
PARTICIPANT DEFINITION:	Number of Units receiving service
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	3	0
Feb	2	0
Mar	1	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	1	0
Oct	0	0
Nov	9	0
Dec	0	0
YTD	16	0
PTD	223	84

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	11,883	127,354
Anticipated Peak Demand (kW) Reduction:		
Summer	1	73
Winter	5	99

<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive</u>	
		<u>Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$1,820	\$0	\$17,456
Equipment/Vendor:	\$950	\$0	\$14,050
Promotional:	\$3,028	\$0	\$12,512
Customer Incentives:	\$1,305	\$0	\$20,880
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$7,102	\$0	\$64,897
Lost Revenues:	\$2,351	\$0	\$5,746
Efficiency Incentive:	\$0	\$0	\$3,496
Maximizing Incentive:	\$355	\$0	\$1,885
Total Costs	\$9,808	\$0	\$76,024

COMMENTS:

The Commercial HVAC Diagnostic and Tune-up Program provides a variety of HVAC services, including diagnostic performance checks on commercial unitary central air conditioning and heat pump units.

The Equipment / Vendor cost includes the cost of incentives for participating HVAC dealers promotion of the program. In 2013 the customer incentives are reduced to \$30 from \$75 and dealer incentives are reduced to \$25 from \$50.

The YTD Estimated in Place Energy (kWh) Savings for heat pump and air conditioner participants is 5,111 and 63 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for heat pump and air conditioner participants is 1/4 and 0/0 respectively.

The YTD Lost Revenue for heat pump and air conditioner participants is \$670 and \$98 respectively.

The Maximizing Incentive for heat pump participants is \$79 and for air conditioner participants is \$6.

The participant and expense forecast for 2013 is zero central air conditioners and 15 heat pumps and \$6,931 respectively.

The participant and expense forecast for 2014 is zero central air conditioners and 24 heat pumps and \$11,181 respectively.

PROGRAM INFORMATION	
PROGRAM:	Pilot Commercial Load Management
PARTICIPANT DEFINITION:	Number of Switches Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan		
Feb		
Mar		
Apr		
May		
Jun		
Jul		
Aug		
Sep		
Oct		
Nov		
Dec		
YTD	0	0
PTD	0	0

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	0
Anticipated Peak Demand (kW) Reduction:		
Summer	0	0
Winter	0	0

Costs	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Description			
Total Evaluation	\$0	\$0	\$17,939
Equipment/Vendor:	\$1,500	\$0	\$30,000
Promotional:	\$0	\$0	\$240
Customer Incentives:	\$0	\$0	\$0
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$1,500	\$0	\$48,179
Lost Revenues:	\$0	\$0	\$0
Efficiency Incentive:	\$0	\$0	\$0
Maximizing Incentive:	\$0	\$0	\$0
Total Costs	\$1,500	\$0	\$48,179

COMMENTS:

The Pilot Commercial Load Management Program will determine whether peak demand can be effectively reduced through the installation of load control devices on central air conditioners, heat pumps, and/or electric water heaters. The pilot program was completed December 31, 2012.

The participant and expense forecast for 2013 is 0 air conditioner switches and 0 water heater switches. Program expenses for 2013 are complete and total \$1,500.

PROGRAM INFORMATION	
PROGRAM:	Commercial High Efficiency HP/AC
PARTICIPANT DEFINITION:	Number of Units Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>Heat Pump</u>	<u>Air Conditioner</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	3	0
May	2	0
Jun	0	0
Jul	0	0
Aug	3	0
Sep	2	0
Oct	0	0
Nov	0	0
Dec	1	0
YTD	11	0
PTD	52	4

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	7,048	33,450
Anticipated Peak Demand (kW) Reduction:		
Summer	1	8
Winter	6	26

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$1,843	\$0	\$19,793
Equipment/Vendor:	\$550	\$0	\$2,750
Promotional:	\$3,980	\$0	\$23,056
Customer Incentives:	\$4,500	\$0	\$20,200
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$10,873	\$0	\$65,799
Lost Revenues:	\$1,153	\$0	\$1,683
Efficiency Incentive:	\$0	\$0	\$1,224
Maximizing Incentive:	\$544	\$0	\$2,114
Total Costs	\$12,570	\$0	\$70,820

COMMENTS:

The Commercial High Efficiency Heat Pump/Air Conditioner program offers financial incentive to small commercial customers (< 100 kW demand) who upgrade to a new qualifying central air conditioner or heat pump with a Consortium for Energy Efficiency (CEE) rating. Applicable for 5 ton units or less.

The YTD Estimated in Place Energy (kWh) Savings for heat pump and air conditioner participants is 1,410 and 0 respectively.

The YTD Anticipated Peak Demand (kW) Reduction summer/winter for heat pump and air conditioner participants is 0/3 and 0/0 respectively.

The YTD Lost Revenue for heat pump and air conditioner participants is \$608 and \$9 respectively.

The Maximizing Incentive for heat pump participants is \$135 and for air conditioner participants is \$0.

The participant and expense forecast for 2013 is 1 central air conditioners and 12 heat pumps with a program budget of \$11,955.

The participant and expense forecast for 2014 is 5 central air conditioners and 10 heat pumps with a program budget of \$17,731.

PROGRAM INFORMATION	
PROGRAM:	Commercial Incentive
PARTICIPANT DEFINITION:	Number of Participants Projects Installed
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants	Projects Installed
Jan	3
Feb	11
Mar	9
Apr	11
May	15
Jun	4
Jul	12
Aug	17
Sep	5
Oct	10
Nov	8
Dec	46
YTD	151
PTD	425

Impacts	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	1,658,662	2,222,697
Anticipated Peak Demand (kW) Reduction:		
Summer	905	1,752
Winter	905	1,752

Costs	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	\$11,385	\$0	\$82,646
Equipment/Vendor:	\$353,839	\$0	\$1,176,254
Promotional:	\$6,989	\$0	\$19,021
Customer Incentives:	\$576,125	\$0	\$1,015,004
Other Costs:	\$0	\$0	\$0
Total Program Costs	\$948,338	\$0	\$2,292,925
Lost Revenues:	\$68,034	\$0	\$40,227
Efficiency Incentive:	\$0	\$0	\$42,852
Maximizing Incentive:	\$47,417	\$0	\$102,031
Total Costs	\$1,063,789	\$0	\$2,478,035

COMMENTS:

The Commercial Incentive program offers energy savings for all commercial business customers through promotion of high efficiency electric lighting, HVAC, pumps, and motors. Primary objectives include; increasing the market share and installation rate of high efficiency technologies, and improving the operating efficiencies of existing long life equipment for commercial customers.

The participant and expense forecast for 2014 is 250 customers and \$1,459,838.

PROGRAM INFORMATION	
PROGRAM:	Smart Audit - Commercial - Inactive
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants			
	<u>Class I</u>	<u>Class II</u>	
Jan	0	0	
Feb	0	0	
Mar	0	0	
Apr	0	0	
May	0	0	
Jun	0	0	
Jul	0	0	
Aug	0	0	
Sep	0	0	
Oct	0	0	
Nov	0	0	
Dec	0	0	
YTD	0	0	
PTD	1,952	194	

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	n/a	n/a
Anticipated Peak Demand (kW) Reduction:		
Summer	n/a	n/a
Winter	n/a	n/a

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	30,661.00
Equipment/Vendor:	0.00	0.00	1,268,176.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	(8,156.00)
Total Program Costs	0.00	0.00	1,290,681.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	64,533.00
Total Costs	0.00	0.00	1,355,214.00

COMMENTS:

This program was discontinued December 31, 2002.

PROGRAM INFORMATION	
PROGRAM:	Smart Incentive - Commercial - Inactive
PARTICIPANT DEFINITION:	Number of Incentives
CUSTOMER SECTOR:	Commercial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>Existing Building</u>	<u>New Building</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	182	69

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	125,682,085
Anticipated Peak Demand (kW) Reduction:		
Summer	0	1,519
Winter	0	2,640

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	144,039.00
Equipment/Vendor:	0.00	0.00	21,504.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	399,592.00
Other Costs:	0.00	0.00	691.00
Total Program Costs	0.00	0.00	565,826.00
Lost Revenues:	0.00	442.00	891,458.00
Efficiency Incentive:	0.00	1,078.00	88,039.00
Maximizing Incentive:	0.00	0.00	281.00
Total Costs	0.00	1,520.00	1,545,604.00

COMMENTS:

This program was discontinued December 31, 2002.

PROGRAM INFORMATION	
PROGRAM:	Smart Audit - Industrial - Inactive
PARTICIPANT DEFINITION:	Number of Audits
CUSTOMER SECTOR:	Industrial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>Class I</u>	<u>Class II</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	60	4

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	n/a	n/a
Anticipated Peak Demand (kW) Reduction:		
Summer	n/a	n/a
Winter	n/a	n/a

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	5,741.00
Equipment/Vendor:	0.00	0.00	37,786.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	0.00
Other Costs:	0.00	0.00	161.00
Total Program Costs	0.00	0.00	43,688.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	0.00
Maximizing Incentive:	0.00	0.00	2,186.00
Total Costs	0.00	0.00	45,874.00

COMMENTS:

This program was discontinued December 31, 1998.

PROGRAM INFORMATION	
PROGRAM:	Smart Incentive - Industrial - Inactive
PARTICIPANT DEFINITION:	Number of Incentives
CUSTOMER SECTOR:	Industrial
REPORTING PERIOD:	January 1, 2013 - December 31, 2013

New Participants		
	<u>General</u>	<u>Compressed Air</u>
Jan	0	0
Feb	0	0
Mar	0	0
Apr	0	0
May	0	0
Jun	0	0
Jul	0	0
Aug	0	0
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
YTD	0	0
PTD	1	0

Impacts		
	<u>Year-To-Date</u>	<u>Program-To-Date</u>
Estimated in Place Energy (kWh) Savings	0	170,525
Anticipated Peak Demand (kW) Reduction:		
Summer	0	6
Winter	0	6

Costs			
<u>Description</u>	<u>Year-To-Date</u>	<u>Retroactive Adjustment</u>	<u>Program-To-Date</u>
Total Evaluation	0.00	0.00	28,385.00
Equipment/Vendor:	0.00	0.00	3,288.00
Promotional:	0.00	0.00	0.00
Customer Incentives:	0.00	0.00	441.00
Other Costs:	0.00	0.00	0.00
Total Program Costs	0.00	0.00	32,114.00
Lost Revenues:	0.00	0.00	0.00
Efficiency Incentive:	0.00	0.00	383.00
Maximizing Incentive:	0.00	0.00	655.00
Total Costs	0.00	0.00	33,152.00

COMMENTS:

This program was discontinued December 31, 1998.

KENTUCKY POWER COMPANY		Exhibit C					PAGE 1 of 22	
DERIVATION OF 3 SECTOR SURCHARGES FOR 3 YR EXPERIMENT		TOTAL YEARS		YEAR 17	YEAR 18	YEAR 18	YEAR 19	TOTAL
		1 thru year 17	2nd	1st	2nd	1st		
		HALF	HALF	HALF	HALF	HALF		
		(1)	(2)	(3)	(4)	(5)	(6)	
RESIDENTIAL SECTOR								
1a	Market Potential Study	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$18,327,558	\$1,427,646	\$1,366,552	\$1,446,519	\$1,933,901	\$24,502,176	
2	CUMULATIVE (OVER)/UNDER COLLECTION	0	508,948	1,054,802	1,373,576	713,423	-	
3	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	(41,824)	0	0	0	0	(41,824)	
4	TOTAL TO BE RECOVERED	18,285,734	1,936,594	2,421,354	2,820,095	2,647,324	24,460,352	
5	TOTAL AMOUNT RECOVERED	17,776,440	881,792	1,047,778	2,106,672	0	21,812,682	
6	EXPECTED FUTURE RECOVERIES	0	0	0	0	1,681,109	1,681,109	
7	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(9,833)	0	0	0	0	(9,833)	
8	TRANSFER PORTION OF BALANCE FROM COMMERCIAL	9,487	0	0	0	0	9,487	
9	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$508,948	\$1,054,802	\$1,373,576	\$713,423	\$966,215	\$966,215	
10	AMOUNT TO BE RECOVERED					\$2,647,324		
11	ADJ. ESTIMATED SECTOR KWH - YEAR 19				1,090,455,600	1,161,789,200		
SURCHARGE RANGE (\$ PER KWH)								
12	FLOOR (CARRYOVER)	COL. 4, L 2 / COL. 4, L 11				0.000814		
13	MIDPOINT - proposed rate				0.002145	0.001447		
14	CEILING (TOTAL COST)	COL. 4, L 4 / COL. 4, L 11				0.002279		
COMMERCIAL SECTOR								
15a	Market Potential Study	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15b	School Energy Management Program	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$3,672,773	\$860,775	\$352,346	\$735,321	\$872,327	\$6,493,542	
16	CUMULATIVE (OVER)/UNDER COLLECTION	0	(466,392)	35,997	14,406	215,686	0	
17	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	1,520	0	0	0	0	1,520	
18	TOTAL TO BE RECOVERED	3,674,293	394,383	388,343	749,727	1,088,013	6,495,062	
19	TOTAL AMOUNT RECOVERED	4,127,920	358,386	373,937	534,041	0	5,394,284	
20	EXPECTED FUTURE RECOVERIES	0	0	0	0	651,981	651,981	
21	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(3,278)	0	0	0	0	(3,278)	
22	TRANSFER BALANCE TO RESIDENTIAL	(9,487)	0	0	0	0	(9,487)	
22	(OVER)/UNDER COLLECTION TO BE REFUNDED	(\$466,392)	\$35,997	\$14,406	\$215,686	\$436,032	\$436,032	
23	AMOUNT TO BE RECOVERED					\$1,088,013		
24	ADJ. ESTIMATED SECTOR KWH - YEAR 19				677,623,200	661,238,700		
SURCHARGE RANGE (\$ PER KWH)								
25	FLOOR (CARRYOVER)					0.000326		
26	MIDPOINT - proposed rate				0.000825	0.000986		
27	CEILING (TOTAL COST)					0.001645		
INDUSTRIAL SECTOR								
28	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$79,026	\$0	\$0	\$0	\$0	\$79,026	
29	CUMULATIVE (OVER)/UNDER COLLECTION	0	0	0	0	0	0	
30	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	0	0	0	0	0	0	
31	TOTAL TO BE RECOVERED	79,026	0	0	0	0	79,026	
32	TOTAL AMOUNT RECOVERED	92,137	0	0	0	0	92,137	
33	EXPECTED FUTURE RECOVERIES	0	0	0	0	0	0	
34	TRANSFER BALANCE TO RESIDENTIAL & COMMERCIAL	13,111	0	0	0	0	13,111	
35	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$0	\$0	\$0	\$0	\$0	\$0	
36	AMOUNT TO BE RECOVERED					\$0		
37	ADJ. ESTIMATED SECTOR KWH - YEAR 19				1,424,103,800	1,403,528,000		
SURCHARGE RANGE (\$ PER KWH)								
38	FLOOR (CARRYOVER)					0.000000		
39	MIDPOINT				0.000000	0.000000		
40	CEILING (TOTAL COST) - proposed rate					0.000000		

1996												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
YEAR 1												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/WR (5)	TOTAL ENERGY SAVINGS KWH/YR (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	552	148	\$221.65	\$122,351	2,690	398,120	\$0.03	\$12,397	\$43,177		\$43,177	\$177,925
Targeted Energy Efficiency - All Electric	223	101	\$1,026.88	\$228,994	5,570	562,370	\$0.03	\$17,513	\$0	\$11,450	\$11,450	\$257,957
- Non-All Electric	74	35	\$372.19	\$27,542	680	23,800	\$0.03	\$744	\$719		\$719	\$29,005
Compact Fluorescent Bulb	269	73	\$56.06	\$15,081	62	4,526	\$0.03	\$140	\$425		\$425	\$15,646
High - Efficiency Heat Pump - Resistance Heat	539	216	\$73.49	\$39,611	2,275	491,400	\$0.03	\$15,292	\$10,634		\$10,634	\$65,537
- Non Resistance Heat	527	206	\$91.31	\$32,310	813	187,478	\$0.03	\$5,215	\$8,796		\$8,796	\$46,321
High - Efficiency Heat Pump - Mobile Home	356	150	\$486.95	\$176,914	2,160	341,200	\$0.03	\$10,617	\$13,834		\$13,834	\$201,365
Mobile Home New Construction	70	22	\$292.89	\$20,488	0	0				\$1,024	\$1,024	\$21,512
TOTAL RESIDENTIAL PROGRAMS	2,610	999		\$663,291		1,889,174		\$61,918	\$77,565	\$12,474	\$90,059	\$815,266
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	91	19	\$1,258.51	\$114,524	0	0	0	0	0	\$5,726	\$5,726	\$120,250
- Class 2	5	1	\$1,875.40	\$9,377	0	0	0	0	0	\$469	\$469	\$9,846
Smart Financing - Existing Building	1	0	\$5,794.00	\$5,794.00	22,000	0	\$0.04	\$0	\$0	\$0	\$0	\$5,000
Smart Financing - New Building	0	0	0	0	30,600	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	97	20		\$129,695		0		\$0	\$506	\$6,195	\$6,701	\$136,996
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	15	1	\$149.40	\$2,241	0	0	0	0	0	\$112	\$112	\$2,353
Smart Audit - Class 2	2	1	\$8,980.00	\$17,960	0	0	0	0	0	\$898	\$898	\$18,858
Smart Financing - General	0	0	0	\$3,919	25,200	0	\$0.04	\$0	\$0	\$196	\$196	\$4,115
Smart Financing - Compressed Air System	0	0	0	0	164,800	0	\$0.03	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	17	2		\$24,120		0		\$0	\$0	\$1,206	\$1,206	\$25,226
TOTAL COMPANY	2,724	991		\$917,106		1,889,174		\$61,918	\$78,091	\$19,675	\$97,666	\$976,990
* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.												

1997	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ACT. PROGRAM COSTS (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOST REVENUE MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/MOS (2)(X)(5) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)(X)(7) (8)	EFFICIENCY INCENTIVE (EX C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (4)(X)(5%) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)+(10)+(11) (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 1997												
YEAR 2 (1st HALF)												
PROGRAM DESCRIPTIONS												
RESIDENTIAL PROGRAMS												
Energy Fitness	273	651	\$260.68	\$71,167	1,345	875,595	\$0.03	\$27,266	\$21,354	n/a	\$21,354	\$119,767
Targeted Energy Efficiency - All Electric	118	279	\$818.87	\$96,638	2,765	777,015	\$0.03	\$24,108	\$0	\$4,832	\$4,832	\$125,658
- Non-All Electric	26	88	\$68.23	\$2,294	349	29,920	\$0.03	\$935	\$252	n/a	\$252	\$3,481
Compact Fluorescent Bulb	0	269	\$0	\$0	31	0.339	\$0.03	\$258	\$0	n/a	\$0	\$258
High - Efficiency Heat Pump - Resistance Heat	123	590	\$2.58	\$317	1,136	671,420	\$0.03	\$20,895	\$2,427	n/a	\$2,427	\$23,639
- Non Resistance Heat	124	581	\$2.96	\$316	407	236,467	\$0.03	\$7,364	\$2,070	n/a	\$2,070	\$9,752
High - Efficiency Heat Pump - Mobile Home	109	403	\$157.87	\$17,208	1,080	435,240	\$0.03	\$13,540	\$4,236	n/a	\$4,236	\$34,984
Mobile Home New Construction	12	78	\$635.17	\$7,622	0	0	n/a	n/a	\$0	\$381	\$381	\$8,003
TOTAL RESIDENTIAL PROGRAMS	765	2,939		\$195,564		3,033,995		\$94,446	\$30,339	\$5,213	\$35,552	\$325,562
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	243	207	\$264.00	\$64,152	0	0	n/a	n/a	\$0	\$3,208	\$3,208	\$67,360
- Class 2	11	9	\$2,705.00	\$29,755	0	0	n/a	n/a	\$0	\$1,488	\$1,488	\$31,243
Smart Financing - Existing Building	0	1	n/a	\$5,629	11,000	11,000	\$0.04	\$469	\$0	\$281	\$281	\$6,379
Smart Financing - New Building	1	0	\$4,692.00	\$4,692	15,300	0	\$0.04	\$0	\$50	n/a	\$50	\$4,742
TOTAL COMMERCIAL PROGRAMS	255	217		\$104,228		11,000		\$469	\$50	\$4,977	\$5,027	\$109,724
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	9	20	\$276.56	\$2,516	0	0	n/a	n/a	\$0	\$126	\$126	\$2,642
Smart Audit - Class 2	1	2	\$1,133.00	\$1,133	0	0	n/a	n/a	\$0	\$57	\$57	\$1,190
Smart Financing - General	0	0	n/a	\$7,440	14,100	0	\$0.04	\$0	\$0	\$392	\$392	\$8,232
Smart Financing - Compressed Air System	0	0	\$0	\$0	82,400	0	\$0.03	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	10	22		\$11,489		0		\$0	\$0	\$575	\$575	\$12,064
TOTAL COMPANY	1,050	3,178		\$311,281		3,044,996		\$94,915	\$30,389	\$10,785	\$41,154	\$447,350

* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
YEAR 2 (3rd QTR)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/IQTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/IQTR (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG. 21C) (9)	MAXIMIZING INCENTIVE (% OF COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	257	957	\$184.99	\$47,542	341	326,337	\$0.03	\$10,156	\$5,340	n/a	\$5,340	\$65,038
Targeted Energy Efficiency - All Electric	51	369	\$1,090.08	\$55,594	1,392	513,648	\$0.03	\$15,980	\$0	\$2,780	\$2,780	\$74,354
- Non-All Electric	15	108	\$193.33	\$2,900	170	18,360	\$0.03	\$574	\$25	n/a	\$25	\$3,499
Compact Fluorescent Bulb	0	269	n/a	\$0	16	4,304	\$0.03	\$133	\$0	\$0	\$0	\$133
High - Efficiency Heat Pump - Resistance Heat	109	717	\$65.05	\$6,000	547	382,199	\$0.03	\$12,213	\$787	n/a	\$787	\$19,000
- Non Resistance Heat	84	695	\$66.18	\$5,559	221	153,995	\$0.03	\$4,786	\$2,445	n/a	\$2,445	\$12,760
High - Efficiency Heat Pump - Mobile Home	77	509	\$689.62	\$53,101	625	318,125	\$0.03	\$9,894	\$2,503	n/a	\$2,503	\$65,498
Mobile Home New Construction	0	82	n/a	\$6,092	0	0			\$0	\$305	\$305	\$6,397
TOTAL RESIDENTIAL PROGRAMS	593	3,706		\$176,788		1,726,668		\$53,736	\$11,100	\$3,085	\$14,185	\$244,709
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	98	383	\$413.13	\$40,487	0	0			\$0	\$2,024	\$2,024	\$42,511
- Class 2	5	19	\$2,705.00	\$13,525	0	0			\$0	\$676	\$676	\$14,201
Smart Financing - Existing Building	2	2	\$3,067.00	\$6,134	11,100	22,200	\$0.04	\$940	\$1,627	n/a	\$1,627	\$8,701
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$327	\$0	\$0	\$0	\$327
TOTAL COMMERCIAL PROGRAMS	105	405		\$60,146		29,850		\$1,267	\$1,627	\$2,700	\$4,327	\$65,740
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	3	26	\$665.00	\$1,998	0	0			\$0	\$100	\$100	\$2,098
Smart Audit - Class 2	0	3	n/a	\$0	0	0			\$0	\$0	\$0	\$0
Smart Financing - General	0	0	n/a	\$4,785	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$4,785
Smart Financing - Compressed Air System	0	0		\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	3	29		\$6,783		0		\$0	\$0	\$100	\$100	\$6,893
TOTAL COMPANY	701	4,140		\$243,717		1,756,418		\$55,003	\$12,727	\$5,885	\$18,612	\$317,332

* Lost revenue and efficiency incentives are based on prospective values.

Exhibit C
PAGE 3B of 22

1987												
KENTUCKY POWER COMPANY												
ESTIMATED SECTOR SURCHARGES FOR 3 YR. PROGRAM												
YEAR 2 (4th QTR)												
NEW PARTICIPANT NUMBER												
PROGRAM DESCRIPTIONS												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (1)(X3)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/QTR (6)	NET LOST REVENUE (SIKWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG. 21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (4)(X3%) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	432	1,287	\$259.53	\$112,115	341	438,867	\$0.03	\$13,658	\$8,977	n/a	\$6,977	\$134,750
Targeted Energy Efficiency - All Electric	124	443	\$924.15	\$114,895	1,393	617,899	\$0.03	\$19,199	\$5,730	n/a	\$5,730	\$139,523
- Non-All Electric	78	146	\$103.55	\$8,077	170	24,820	\$0.03	\$775	\$129	n/a	\$129	\$9,981
Compact Fluorescent Bulb	0	269	n/a	\$0	17	4,573	\$0.03	\$141	\$0	\$0	\$0	\$141
High - Efficiency Heat Pump - Resistance Heat	111	823	\$106.80	\$11,866	547	450,181	\$0.03	\$14,019	\$801	n/a	\$801	\$26,686
- Non-Resistance Heat	102	782	\$142.21	\$14,595	221	172,822	\$0.03	\$5,385	\$2,969	n/a	\$2,969	\$22,859
High - Efficiency Heat Pump - Mobile Home	50	505	\$406.70	\$20,335	625	353,125	\$0.03	\$10,982	\$1,625	n/a	\$1,625	\$32,942
Mobile Home New Construction	0	82	n/a	(\$749)	0	0						
TOTAL RESIDENTIAL PROGRAMS	897	4,387		\$280,744	2,061,487			\$64,158	\$14,501		\$20,194	\$385,096
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	71	473	\$230.92	\$16,395	0	0		\$0	\$0	\$820	\$820	\$17,215
- Class 2	21	33	\$2,705.00	\$56,805	0	0		\$0	\$0	\$2,840	\$2,840	\$59,645
Smart Financing - Existing Building	9	8	\$2,282.56	\$20,543	11,100	89,800	\$0.04	\$3,761	\$7,320	n/a	\$7,320	\$31,624
Smart Financing - New Building	0	1	n/a	\$0	7,690	7,690	\$0.04	\$327	\$0	n/a	\$0	\$327
TOTAL COMMERCIAL PROGRAMS	101	515		\$83,743	96,490			\$4,088	\$7,320		\$10,980	\$108,811
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	18	37	\$524.22	\$9,436	0	0		\$0	\$0	\$472	\$472	\$9,908
Smart Audit - Class 2	0	3	n/a	\$1,094	0	0		\$0	\$0	\$55	\$55	\$1,149
Smart Financing - General	0	0	n/a	\$11,802	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$11,802
Smart Financing - Compressed Air System	0	0	n/a	\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	18	40		\$22,332	0	0		\$0	\$0		\$527	\$22,859
TOTAL COMPANY	1,016	4,952		\$396,819	2,157,937			\$68,246	\$21,821		\$9,860	\$486,766

* Lost revenue and efficiency incentives are based on prospective values.

1998												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 3 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REVENUE MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (6)	NET LOST REVENUE (7)	TOTAL NET* REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	544	1,768	\$104.44	\$100,334	692	1,205,776	\$0.03	\$37,824	\$11,304	n/a	\$11,304	\$149,162
Targeted Energy Efficiency - All Electric	122	555	\$1,132.92	\$138,216	2,784	1,572,960	\$0.03	\$48,935	\$0	\$6,911	\$6,911	\$194,082
- Non-All Electric	24	203	\$112.92	\$2,710	340	69,020	\$0.03	\$2,156	\$40	n/a	\$40	\$4,906
Compact Fluorescent Bulb	0	269	\$0.00	\$0	32	8,608	\$0.03	\$265	\$0	\$0	\$0	\$266
High - Efficiency Heat Pump - Resistance Heat	21	887	\$70.10	\$1,472	1,094	970,378	\$0.03	\$30,218	\$152	n/a	\$152	\$31,642
- Non Resistance Heat	26	848	\$70.00	\$1,820	442	374,816	\$0.03	\$11,679	\$757	n/a	\$757	\$14,266
High - Efficiency Heat Pump - Mobile Home	66	615	\$555.30	\$35,330	1,250	770,000	\$0.03	\$23,847	\$2,145	n/a	\$2,145	\$51,422
Mobile Home New Construction	0	82	n/a	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	803	5,238		\$279,882		4,971,558		\$154,725	\$14,398	\$6,911	\$21,309	\$455,916
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	204	597	\$194.13	\$39,602	0	0	n/a	\$0	\$0	\$1,980	\$1,980	\$41,582
- Class 2	28	60	\$1,600.00	\$44,800	0	0	n/a	\$0	\$0	\$2,240	\$2,240	\$47,040
Smart Financing - Existing Building	8	16	\$5,591.50	\$44,952	22,200	355,200	\$0.04	\$15,043	\$6,505	n/a	\$6,505	\$66,201
Smart Financing - New Building	1	1	\$4,564.00	\$4,564	15,300	15,300	\$0.04	\$654	\$29	\$0	\$29	\$5,247
TOTAL COMMERCIAL PROGRAMS	241	674		\$133,618		370,500		\$15,697	\$6,535	\$4,220	\$10,755	\$160,070
INDUSTRIAL PROGRAMS - (W/Est. Opt-Outs Removed)												
Smart Audit - Class 1	12	51	\$246.08	\$2,953	0	0	n/a	\$0	\$0	\$148	\$148	\$3,101
Smart Audit - Class 2	1	3	\$1,800.00	\$1,800	0	0	n/a	\$0	\$0	\$90	\$90	\$1,890
Smart Financing - General	0	0	\$0.00	\$0	29,260	0	\$0.04	\$0	\$0	\$67	\$67	\$1,405
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	13	54		\$5,091		0		\$0	\$0	\$305	\$305	\$6,396
TOTAL COMPANY	1,057	5,966		\$419,591		5,342,058		\$170,422	\$20,933	\$11,436	\$32,369	\$622,382

* Lost revenue and efficiency incentives are based on prospective values.

1998												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 3 (2nd HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REVENUE MOS (KWH-IPARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/MOS) (2)X(5)	NET LOST REVENUE (KWH) (7)	TOTAL NET* LOST REVENUES (6)X(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE (9)X(10)	TOTAL EST. COSTS TO BE RECOVERED (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Efficiency - All Electric	448	2,277	\$301.30	\$134,962	682	1,552,914	\$0.03	\$48,327	\$9,309	\$0	\$9,309	\$193,618
Energy Efficiency - Non-All Electric	131	697	\$1,187.51	\$155,554	2,784	1,940,448	\$0.03	\$60,367	\$7,778	\$0	\$7,778	\$223,709
Compact Fluorescent Bulb	42	238	\$139.62	\$5,964	340	80,920	\$0.03	\$2,528	\$70	\$0	\$70	\$5,462
High - Efficiency Heat Pump - Resistance Heat	0	269	\$0.00	\$0	32	8,608	\$0.03	\$266	\$0	\$0	\$0	\$266
High - Non Resistance Heat	108	940	\$147.45	\$15,925	1,094	1,028,360	\$0.03	\$12,003	\$760	\$0	\$760	\$48,728
High - Efficiency Heat Pump - Mobile Home	64	894	\$72.27	\$4,625	442	385,148	\$0.03	\$12,313	\$1,663	\$0	\$1,663	\$16,801
Mobile Home New Construction	173	764	\$514.50	\$89,009	1,250	955,000	\$0.03	\$29,701	\$5,623	\$0	\$5,623	\$124,333
TOTAL RESIDENTIAL PROGRAMS	33	11	\$548.45	\$16,132	0	n/a	n/a		\$0	\$907	\$907	\$19,039
COMMERCIAL PROGRAMS	999	6,090		\$424,101		5,967,398		\$185,525	\$17,645	\$0,685	\$26,330	\$635,956
Smart Audit - Class 1	178	795	\$534.85	\$95,203	0	n/a	n/a		\$0	\$4,760	\$4,760	\$99,963
Smart Audit - Class 2	9	73	\$2,800.00	\$25,200	0	n/a	n/a		\$0	\$1,260	\$1,260	\$28,460
Smart Financing - Existing Building	29	32	\$1,078.66	\$54,487	22,200	710,400	\$0.04	\$30,085	\$23,585	\$0	\$23,585	\$106,157
Smart Financing - New Building	5	6	\$1,529.20	\$7,646	15,300	91,800	\$0.04	\$3,926	\$144	\$0	\$144	\$11,716
TOTAL COMMERCIAL PROGRAMS	221	906		\$182,536		802,200		\$34,011	\$23,729	\$6,020	\$29,749	\$246,206
INDUSTRIAL PROGRAMS - (WEST, OIR-OUTS REMOVED)												
Smart Audit - Class 1	3	59	\$852.33	\$2,557	0	n/a	n/a		\$0	\$128	\$128	\$2,685
Smart Audit - Class 2	0	4	\$0.00	\$0	0	n/a	n/a		\$0	\$0	\$0	\$0
Smart Financing - General	1	0	\$0.00	\$2,430	29,250	0	\$0.04	\$0	\$383	\$0	\$383	\$2,813
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	4	63		\$4,987		0		\$0	\$383	\$128	\$511	\$5,498
TOTAL COMPANY	1,224	7,059		\$611,624		6,763,598		\$219,536	\$47,757	\$14,633	\$66,690	\$887,750

* Lost revenue and efficiency incentives are based on prospective values.

1998												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/HALF (2X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (6)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	306	2,684	\$312.58	\$95,660	707	1,904,658	\$0.03	\$59,273	\$10,370	\$0	\$10,370	\$165,293
Targeted Energy Efficiency - All Electric	75	773	\$1,907.41	\$143,056	630	486,090	\$0.03	\$15,150	\$0	\$7,153	\$7,153	\$165,359
- Non-All Electric	12	249	\$112.00	\$1,344	306	76,194	\$0.03	\$2,380	\$60	\$0	\$60	\$3,784
Compact Fluorescent Bulb	0	269	\$0.00	\$0	31	8,339	\$0.03	\$258	\$0	\$0	\$0	\$258
High - Efficiency Heat Pump - Resistance Heat	99	1,002	\$273.74	\$27,100	1,200	1,202,400	\$0.03	\$37,443	\$4,375	\$0	\$4,375	\$69,918
- Non Resistance Heat	2	853	\$50.00	\$100	442	377,026	\$0.03	\$11,748	\$0	\$5	\$5	\$11,853
High - Efficiency Heat Pump - Mobile Home	101	826	\$545.99	\$55,145	1,475	1,219,350	\$0.03	\$37,891	\$8,505	\$0	\$8,505	\$101,541
Mobile Home New Construction ***	98	45	\$587.20	\$57,546	1,756	79,020	\$0.03	\$2,458	\$4,353	\$0	\$4,353	\$64,357
TOTAL RESIDENTIAL PROGRAMS	693	6,711		\$379,941		5,352,977		\$166,601	\$27,663	\$7,158	\$34,821	\$581,363
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	186	964	\$204.71	\$38,076	0	0	n/a	\$0	\$1,904	\$0	\$1,904	\$39,980
- Class 2	16	87	\$2,705.00	\$43,280	0	0	n/a	\$0	\$2,164	\$0	\$2,164	\$45,444
Smart Financing - Existing Building	6	51	\$5,109.67	\$30,658	13,262	677,392	\$0.04	\$28,667	\$1,395	\$0	\$1,395	\$65,740
Smart Financing - New Building	3	9	\$0.00	\$2,350	14,101	126,909	\$0.04	\$5,428	\$787	\$0	\$787	\$6,565
TOTAL COMMERCIAL PROGRAMS	211	1,111		\$114,364		804,291		\$34,115	\$2,182	\$4,068	\$6,250	\$154,729
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	60	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	65		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	904	7,920		\$494,305		6,215,216		\$200,716	\$29,845	\$11,226	\$41,071	\$736,032

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/96.
 *** Participants since 09/01/98.

Exhibit C
PAGE 5A of 22

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (2nd HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REVENUE (5)	TOTAL ENERGY SAVINGS (6)	NET LOST REVENUE (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
			PER PARTICIPANT (1)X(3)		(KWH/HPARTIC) (5)	(2)X(5)	(SIKWH) (7)	(6)X(7)	(9)	(4)X(5)	(9)+(10)	(4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,519	\$0.00	\$972	707	1,780,933	\$0.03	\$55,423	\$0	\$0	\$0	\$66,395
Targeted Energy Efficiency - All Electric	66	700	\$1,222.76	\$80,702	630	441,000	\$0.03	\$13,720	\$0	\$4,035	\$4,035	\$99,457
- Non-All Electric	8	220	\$67.50	\$540	306	67,320	\$0.03	\$2,103	\$40	\$0	\$40	\$2,663
Compact Fluorescent Bulb	0	123	\$0.00	\$0	31	3,813	\$0.03	\$118	\$0	\$0	\$0	\$118
High - Efficiency Heat Pump - Resistance Heat	140	810	\$211.14	\$29,560	1,200	972,000	\$0.03	\$30,268	\$6,187	\$0	\$6,187	\$66,015
- Non Resistance Heat	0	593	\$0.00	\$0	447	265,071	\$0.03	\$8,260	\$0	\$0	\$0	\$8,260
High - Efficiency Heat Pump - Mobile Home	134	739	\$539.07	\$72,236	1,475	1,090,025	\$0.03	\$33,900	\$11,284	\$0	\$11,284	\$117,420
Mobile Home New Construction ***	123	195	\$681.42	\$71,615	1,755	343,980	\$0.03	\$10,668	\$5,464	\$0	\$5,464	\$87,677
TOTAL RESIDENTIAL PROGRAMS	471	5,900	\$235,625	\$472,125		4,964,142		\$154,490	\$22,975	\$4,035	\$27,010	\$437,025
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	188	1,129	\$356.11	\$66,948	0	0	n/a	\$0	\$3,347	\$3,347	\$3,347	\$70,295
- Class 2	21	103	\$2,705.00	\$56,605	0	0	n/a	\$0	\$2,840	\$2,840	\$2,840	\$59,645
Smart Financing - Existing Building	25	66	\$2,726.04	\$68,151	13,282	876,612	\$0.04	\$37,125	\$6,814	\$0	\$6,814	\$111,090
Smart Financing - New Building	8	13	\$3,087.00	\$24,696	14,101	163,313	\$0.04	\$7,840	\$2,099	\$0	\$2,099	\$34,635
TOTAL COMMERCIAL PROGRAMS	242	1,311	\$216,600	\$216,600		1,059,925		\$44,965	\$7,913	\$0,187	\$14,100	\$275,665
INDUSTRIAL PROGRAMS - (WEST. Opt-Outs Removed)												
Smart Audit - Class 1	0	57	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	62	\$0	\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	713	7,273	\$472,125	\$472,125		6,024,067		\$199,455	\$30,888	\$10,222	\$41,110	\$712,650

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/96.
 *** Participants since 09/01/98.

Year 2000												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
Exhibit C PAGE 6A of 22												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (1)X(3)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH-HALF (2)X(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (6)X(7)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,161	\$0.00	\$0	707	1,327,827	\$0.03	\$47,546	\$0	\$0	\$0	\$47,546
Targeted Energy Efficiency - All Electric	66	659	\$1,272.61	\$83,992	630	415,170	\$0.03	\$12,916	\$0	\$4,200	\$4,200	\$101,108
- Non-All Electric	28	202	\$90.82	\$2,543	306	61,812	\$0.03	\$1,931	\$141	\$0	\$141	\$4,615
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	38	683	\$200.00	\$7,600	1,200	819,600	\$0.03	\$25,522	\$1,679	\$0	\$1,679	\$34,801
- Non Resistance Heat	0	348	\$0.00	\$0	447	155,558	\$0.03	\$4,847	\$0	\$0	\$0	\$4,847
High - Efficiency Heat Pump - Mobile Home	45	683	\$500.00	\$22,500	1,476	1,007,425	\$0.03	\$31,331	\$3,789	\$0	\$3,789	\$57,620
Mobile Home New Construction **	101	302	\$550.20	\$55,020	1,755	530,010	\$0.03	\$16,483	\$4,486	\$0	\$4,486	\$74,519
TOTAL RESIDENTIAL PROGRAMS	278	5,039		\$170,185		4,517,400		\$140,576	\$10,085	\$4,200	\$14,285	\$325,055
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	144	1,126	\$397.19	\$57,195	0	0	n/a					
- Class 2	8	112	\$2,705.00	\$21,640	0	0	n/a					
Smart Financing - Existing Building	16	86	\$1,307.31	\$20,917	13,282	1,142,282	\$0.04	\$48,374	\$3,721	\$0	\$3,721	\$73,072
Smart Financing - New Building	4	20	\$6,288.75	\$25,155	14,101	282,020	\$0.04	\$12,052	\$1,049	\$0	\$1,049	\$38,306
TOTAL COMMERCIAL PROGRAMS	172	1,344		\$124,947		1,424,272		\$60,436	\$4,770	\$3,942	\$8,712	\$194,095
INDUSTRIAL PROGRAMS - (W/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a					
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a					
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	450	6,382		\$295,132		5,941,672		\$201,012	\$14,865	\$8,142	\$23,007	\$519,151

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/97.
 *** Participants since 09/01/98

Year 2000												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
Exhibit C PAGE 6B of 22												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (2)X(5) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)X(7) (8)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (% of COSTS) (4)X(5%) (10)	TOTAL * INCENTIVE (9)X(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)+(9)-(11) (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	1,525	\$0.00	\$0	706	1,076,650	\$0.03	\$33,505	\$0	\$0	\$0	\$33,505
Targeted Energy Efficiency - All Electric	99	583	\$1,115.41	\$10,426	630	367,290	\$0.03	\$17,426	\$0	\$5,521	\$5,521	\$127,373
- Non-All Electric	21	170	\$64.67	\$1,988	306	52,020	\$0.03	\$1,825	\$105	\$0	\$105	\$3,718
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	25	481	\$200.00	\$5,000	1,200	577,200	\$0.03	\$17,974	\$1,105	\$0	\$1,105	\$24,079
High - Efficiency Heat Pump - Mobile Home	43	572	\$495.35	\$21,300	1,476	844,272	\$0.03	\$26,257	\$3,621	\$0	\$3,621	\$51,178
Mobile Home New Construction ***	94	403	\$575.00	\$54,050	1,755	707,265	\$0.03	\$21,996	\$4,175	\$0	\$4,175	\$80,221
TOTAL RESIDENTIAL PROGRAMS	282	3,881		\$182,764		3,650,259		\$14,826	\$9,006	\$5,521	\$14,527	\$322,117
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	159	1,026	\$165.24	\$26,273	0	0	n/a	\$33,505	\$1,314	\$0	\$1,314	\$27,597
- Class 2	29	98	\$2,705.00	\$78,445	0	0	n/a	\$17,426	\$3,922	\$0	\$3,922	\$82,367
Smart Financing - Existing Building	24	97	\$914.54	\$21,949	13,282	1,286,354	\$0.04	\$54,562	\$5,581	\$0	\$5,581	\$82,092
Smart Financing - New Building	0	21	\$0.00	\$7,269	14,102	296,142	\$0.04	\$12,666	\$0	\$0	\$0	\$19,935
TOTAL COMMERCIAL PROGRAMS	212	1,242		\$133,936		1,584,496		\$67,228	\$5,581	\$5,236	\$10,817	\$211,981
INDUSTRIAL PROGRAMS (WEST. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	494	5,123		\$326,700		5,274,755		\$182,054	\$14,587	\$10,757	\$25,344	\$534,098

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/97
 *** Participants since 09/01/98.

KENTUCKY POWER COMPANY		Exhibit C					PAGE 1 of 22	
DERIVATION OF 3 SECTOR SURCHARGES FOR 3 YR EXPERIMENT								
RESIDENTIAL SECTOR		TOTAL YEARS	YEAR 17	YEAR 18	YEAR 18	YEAR 19	TOTAL	
		1 thru year 17 1st HALF	2nd HALF	1st HALF	2nd HALF	1st HALF		
		(1)	(2)	(3)	(4)	(5)	(6)	
1a	Market Potential Study	\$0	\$0	\$0	\$0	\$0	\$0	
1	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$18,327,558	\$1,427,646	\$1,366,552	\$1,446,519	\$1,933,901	\$24,502,176	
2	CUMULATIVE (OVER)/UNDER COLLECTION	0	508,948	1,054,602	1,373,576	713,423		
3	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	(41,824)	0	0	0	0	(41,824)	
4	TOTAL TO BE RECOVERED	18,285,734	1,936,594	2,421,354	2,820,095	2,647,324	24,460,352	
5	TOTAL AMOUNT RECOVERED	17,776,440	881,792	1,047,778	2,106,672	0	21,812,682	
6	EXPECTED FUTURE RECOVERIES	0	0	0	0	1,681,109	1,681,109	
7	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(9,833)	0	0	0	0	(9,833)	
8	TRANSFER PORTION OF BALANCE FROM COMMERCIAL	9,487	0	0	0	0	9,487	
9	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$508,948	\$1,054,602	\$1,373,576	\$713,423	\$966,215	\$966,215	
10	AMOUNT TO BE RECOVERED					\$2,647,324		
11	ADJ. ESTIMATED SECTOR KWH - YEAR 19				1,090,455,600	1,161,789,200		
SURCHARGE RANGE (\$ PER KWH)								
12	FLOOR (CARRYOVER)	COL 4, L 2 / COL 4, L 11				0.000614		
13	MIDPOINT - proposed rate				0.002145	0.001447		
14	CEILING (TOTAL COST)	COL 4, L 4 / COL 4, L 11				0.002279		
COMMERCIAL SECTOR		TOTAL YEARS	YEAR 17	YEAR 18	YEAR 18	YEAR 19	TOTAL	
		1 thru year 17 1st HALF	2nd HALF	1st HALF	2nd HALF	1st HALF		
		(1)	(2)	(3)	(4)	(5)	(6)	
15a	Market Potential Study	\$0	\$0	\$0	\$0	\$0	\$0	
15b	School Energy Management Program	\$0	\$0	\$0	\$0	\$0	\$0	
15	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$3,672,773	\$860,775	\$352,346	\$735,321	\$872,327	\$6,493,542	
16	CUMULATIVE (OVER)/UNDER COLLECTION	0	(466,392)	35,997	14,406	215,686	0	
17	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	1,520	0	0	0	0	1,520	
18	TOTAL TO BE RECOVERED	3,674,293	394,383	388,343	749,727	1,088,013	6,495,062	
19	TOTAL AMOUNT RECOVERED	4,127,920	358,386	373,937	534,041	0	5,394,284	
20	EXPECTED FUTURE RECOVERIES	0	0	0	0	651,981	651,981	
21	TRANSFER PORTION OF BALANCE FROM INDUSTRIAL	(3,276)	0	0	0	0	(3,276)	
22	TRANSFER BALANCE TO RESIDENTIAL	(9,487)	0	0	0	0	(9,487)	
22	(OVER)/UNDER COLLECTION TO BE REFUNDED	(\$466,392)	\$35,997	\$14,406	\$215,686	\$436,032	\$436,032	
23	AMOUNT TO BE RECOVERED					\$1,088,013		
24	ADJ. ESTIMATED SECTOR KWH - YEAR 19				677,623,200	661,238,700		
SURCHARGE RANGE (\$ PER KWH)								
25	FLOOR (CARRYOVER)					0.000326		
26	MIDPOINT - proposed rate				0.000825	0.000986		
27	CEILING (TOTAL COST)					0.001645		
INDUSTRIAL SECTOR		TOTAL YEARS	YEAR 17	YEAR 18	YEAR 18	YEAR 19	TOTAL	
		1 thru year 17 1st HALF	2nd HALF	1st HALF	2nd HALF	1st HALF		
		(1)	(2)	(3)	(4)	(5)	(6)	
28	CURRENT PERIOD AMOUNT TO BE RECOVERED	\$79,026	\$0	\$0	\$0	\$0	\$79,026	
29	CUMULATIVE (OVER)/UNDER COLLECTION	0	0	0	0	0	0	
30	18 MOS. RETROACTIVE(OVER)/UNDER ADJUSTMENT	0	0	0	0	0	0	
31	TOTAL TO BE RECOVERED	79,026	0	0	0	0	79,026	
32	TOTAL AMOUNT RECOVERED	92,137	0	0	0	0	92,137	
33	EXPECTED FUTURE RECOVERIES	0	0	0	0	0	0	
34	TRANSFER BALANCE TO RESIDENTIAL & COMMERCIAL	13,111	0	0	0	0	13,111	
35	(OVER)/UNDER COLLECTION TO BE REFUNDED	\$0	\$0	\$0	\$0	\$0	\$0	
36	AMOUNT TO BE RECOVERED					\$0		
37	ADJ. ESTIMATED SECTOR KWH - YEAR 19				1,424,103,800	1,403,528,000		
SURCHARGE RANGE (\$ PER KWH)								
38	FLOOR (CARRYOVER)					0.000000		
39	MIDPOINT				0.000000	0.000000		
40	CEILING (TOTAL COST) - proposed rate					0.000000		

1996													
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM													
YEAR 1	PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/YR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/YR (6)	NET LOST REVENUE (SKWH) (7)	TOTAL NET * LOST REVENUES (6)-(7) (8)	EFFICIENCY INCENTIVE (EX C PG.21C) (9)	MAXIMIZING INCENTIVE (% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)+(9)+(11) (12)
	RESIDENTIAL PROGRAMS												
	Energy Fitness	552	148	\$221.65	\$122,351	2,600	398,120	\$0.03	\$12,397	\$43,177	\$0	\$43,177	\$177,925
	Targeted Energy Efficiency - All Electric	223	101	\$1,026.88	\$228,984	5,570	962,970	\$0.03	\$17,513	\$0	\$11,450	\$11,450	\$257,957
	- Non-All Electric	74	35	\$372.19	\$27,542	690	23,600	\$0.03	\$744	\$718	\$0	\$718	\$29,005
	Compact Fluorescent Bulb	269	73	\$56.06	\$15,081	62	4,526	\$0.03	\$140	\$425	\$0	\$425	\$15,646
	High - Efficiency Heat Pump - Resistance Heat	539	216	\$73.49	\$39,611	2,275	491,400	\$0.03	\$15,292	\$10,634	\$0	\$10,634	\$65,537
	- Non Resistance Heat	527	206	\$91.31	\$32,310	813	167,478	\$0.03	\$5,215	\$8,796	\$0	\$8,796	\$46,321
	High - Efficiency Heat Pump - Mobile Home	356	158	\$496.95	\$176,914	2,160	341,280	\$0.03	\$10,617	\$13,634	\$0	\$13,634	\$201,365
	Mobile Home New Construction	70	22	\$292.69	\$20,488	0	0	\$0.03	\$0	\$1,024	\$0	\$1,024	\$21,512
	TOTAL RESIDENTIAL PROGRAMS	2,910	959		\$663,291		1,989,174		\$61,918	\$77,565	\$12,474	\$90,059	\$815,286
	COMMERCIAL PROGRAMS												
	Smart Audit - Class 1	91	19	\$1,250.51	\$114,524	0	0	\$0.04	\$0	\$0	\$5,726	\$5,726	\$120,250
	- Class 2	5	1	\$1,875.40	\$9,377	0	0	\$0.04	\$0	\$0	\$469	\$469	\$9,646
	Smart Financing - Existing Building	1	0	\$5,794.00	\$5,794	22,000	0	\$0.04	\$0	\$506	\$0	\$506	\$6,300
	Smart Financing - New Building	0	0	\$0	\$0	30,600	0	\$0.04	\$0	\$0	\$0	\$0	\$0
	TOTAL COMMERCIAL PROGRAMS	97	20		\$129,695		0		\$0	\$506	\$6,195	\$6,701	\$136,396
	INDUSTRIAL PROGRAMS - (West. Oil-ouis Removed)												
	Smart Audit - Class 1	15	1	\$149.40	\$2,241	0	0	\$0.04	\$0	\$0	\$112	\$112	\$2,353
	Smart Audit - Class 2	2	1	\$8,890.00	\$17,860	0	0	\$0.04	\$0	\$0	\$998	\$998	\$19,858
	Smart Financing - General	0	0	\$3,919	\$3,919	28,200	0	\$0.04	\$0	\$0	\$198	\$198	\$4,115
	Smart Financing - Compressed Air System	0	0	\$0	\$0	164,800	0	\$0.03	\$0	\$0	\$0	\$0	\$0
	TOTAL INDUSTRIAL PROGRAMS	17	2		\$24,120		0		\$0	\$0	\$1,206	\$1,206	\$25,326
	TOTAL COMPANY	2,724	981		\$817,106		1,989,174		\$61,918	\$78,091	\$19,875	\$97,966	\$976,990

* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 1997												
YEAR 2 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REVA/MOS (KWH/PARTIC) (5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (6)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (8)	MAXIMIZING INCENTIVE (% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)	
RESIDENTIAL PROGRAMS												
Energy Fitness	273	651	\$280.68	\$71,167	1,345	\$0.03	\$27,266	\$21,354	n/a	\$21,354	\$119,767	
Targeted Energy Efficiency - All Electric	118	279	\$818.97	\$96,638	2,785	\$0.03	\$24,188	\$0	\$4,832	\$4,832	\$125,658	
- Non-All Electric	26	88	\$88.23	\$2,294	340	\$0.03	\$935	\$252	n/a	\$252	\$3,481	
Compact Fluorescent Bulb	0	269	\$0	\$0	31	\$0.03	\$258	\$0	n/a	\$0	\$258	
High - Efficiency Heat Pump - Resistance Heat	123	590	\$2.58	\$317	1,138	\$0.03	\$20,895	\$2,427	n/a	\$2,427	\$23,639	
- Non Resistance Heat	124	581	\$2.56	\$318	407	\$0.03	\$7,364	\$2,070	n/a	\$2,070	\$9,752	
High - Efficiency Heat Pump - Mobile Home	109	403	\$157.87	\$17,208	1,080	\$0.03	\$13,540	\$4,236	n/a	\$4,236	\$34,984	
Mobile Home New Construction	12	78	\$635.17	\$7,622	0	n/a	n/a	\$0	\$381	\$381	\$8,003	
TOTAL RESIDENTIAL PROGRAMS	785	2,939		\$195,564			\$94,446	\$30,339	\$5,213	\$35,552	\$325,562	
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	243	207	\$264.00	\$64,152	0	n/a	n/a	\$0	\$3,208	\$3,208	\$67,360	
- Class 2	11	9	\$2,705.00	\$29,755	0	n/a	n/a	\$0	\$1,488	\$1,488	\$31,243	
Smart Financing - Existing Building	0	1	n/a	\$5,629	11,000	\$0.04	\$469	\$0	\$281	\$281	\$6,379	
Smart Financing - New Building	1	0	\$4,692.00	\$4,692	15,300	\$0.04	\$0	\$50	n/a	\$50	\$4,742	
TOTAL COMMERCIAL PROGRAMS	265	217		\$104,228			\$469	\$50	\$4,977	\$5,027	\$109,724	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	9	20	\$278.56	\$2,516	0	n/a	n/a	\$0	\$126	\$126	\$2,642	
Smart Audit - Class 2	1	2	\$7,133.00	\$1,133	0	n/a	n/a	\$0	\$57	\$57	\$1,190	
Smart Financing - General	0	0	n/a	\$7,840	14,100	\$0.04	\$0	\$0	\$392	\$392	\$8,232	
Smart Financing - Compressed Air System	0	0	\$0	\$0	82,400	\$0.03	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	10	22		\$11,489	0		\$0	\$0	\$575	\$575	\$12,064	
TOTAL COMPANY	1,050	3,178		\$311,281	3,044,996		\$94,915	\$30,389	\$10,765	\$41,154	\$447,350	
* Lost revenue and efficiency incentives are based on initial values per the settlement agreement.												

Exhibit C
PAGE 3A of 22

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
YEAR 2 (3rd QTR)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (1)X(3)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/QTR (2)X(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (6)X(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (% of COSTS) (10)	TOTAL * INCENTIVE (9)X(10)	TOTAL EST. COSTS TO BE RECOVERED (4)X(9)X(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	257	957	\$184.99	\$47,542	341	326,337	\$0.03	\$10,156	\$5,340	n/a	\$5,340	\$63,038
Targeted Energy Efficiency - All Electric	51	359	\$1,090.08	\$55,594	1,392	513,648	\$0.03	\$15,960	\$0	\$2,780	\$2,780	\$74,354
- Non-All Electric	15	108	\$193.33	\$2,900	170	18,360	\$0.03	\$574	\$25	n/a	\$25	\$3,499
Compact Fluorescent Bulb	0	269	n/a	\$0	16	4,304	\$0.03	\$133	\$0	\$0	\$0	\$133
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	109	717	\$65.05	\$6,000	547	382,199	\$0.03	\$12,213	\$787	n/a	\$787	\$19,000
High - Efficiency Heat Pump - Mobile Home	77	509	\$689.62	\$53,101	625	318,125	\$0.03	\$9,894	\$2,503	n/a	\$2,503	\$65,498
Mobile Home New Construction	0	82	n/a	\$6,092	0	0				\$305	\$305	\$6,397
TOTAL RESIDENTIAL PROGRAMS	593	3,706		\$176,788		1,726,568		\$53,735	\$11,100	\$3,085	\$14,185	\$244,709
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	98	383	\$413.13	\$40,487	0	0			\$0	\$2,024	\$2,024	\$42,511
- Class 2	5	19	\$2,705.00	\$13,525	0	0			\$0	\$576	\$576	\$14,201
Smart Financing - Existing Building	2	2	\$3,087.00	\$6,174	11,100	22,200	\$0.04	\$840	\$1,627	n/a	\$1,627	\$8,701
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$327	\$0	\$0	\$0	\$327
TOTAL COMMERCIAL PROGRAMS	105	405		\$60,146		29,850		\$1,267	\$1,627	\$2,700	\$4,327	\$65,740
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	3	26	\$666.00	\$1,998	0	0			\$0	\$100	\$100	\$2,098
Smart Audit - Class 2	0	3	n/a	\$0	0	0			\$0	\$0	\$0	\$0
Smart Financing - General	0	0	n/a	\$4,785	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$4,785
Smart Financing - Compressed Air System	0	0		\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	3	29		\$6,783		0		\$0	\$0	\$100	\$100	\$6,883
TOTAL COMPANY	701	4,140		\$243,717		1,756,418		\$55,003	\$12,727	\$5,885	\$18,612	\$317,332

* Lost revenue and efficiency incentives are based on prospective values.

Exhibit C
PAGE 35 of 22

1997												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YR PROGRAM												
												Exhibit C PAGE 3C of 22
YEAR 2 (4th QTR)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/QTR (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	432	1,287	\$259.53	\$12,115	341	438,867	\$0.03	\$13,658	\$8,977	n/a	\$8,977	\$134,750
Targeted Energy Efficiency - All Electric	124	443	\$924.15	\$114,395	1,393	617,099	\$0.03	\$19,198	\$0	\$5,730	\$5,730	\$139,523
- Non-All Electric	78	146	\$103.35	\$8,077	170	24,920	\$0.03	\$775	\$129	n/a	\$129	\$8,981
Compact Fluorescent Bulb	0	269	n/a	\$0	17	4,573	\$0.03	\$141	\$0	\$0	\$0	\$141
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	111	823	\$106.90	\$11,866	547	450,181	\$0.03	\$14,019	\$801	n/a	\$801	\$26,686
High - Efficiency Heat Pump - Mobile Home	102	792	\$142.21	\$14,505	221	172,822	\$0.03	\$5,385	\$2,969	n/a	\$2,969	\$22,859
Mobile Home New Construction	50	565	\$406.70	\$20,335	625	353,125	\$0.03	\$10,982	\$1,625	n/a	\$1,625	\$32,942
TOTAL RESIDENTIAL PROGRAMS	897	4,397	n/a	\$749	0	2,061,487		\$64,158	\$14,501	\$5,693	\$20,194	\$385,096
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	71	473	\$230.92	\$16,395	0	0			\$0	\$820	\$820	\$17,215
- Class 2	21	33	\$2,705.00	\$56,005	0	0			\$0	\$2,840	\$2,840	\$59,845
Smart Financing - Existing Building	9	8	\$2,292.96	\$20,543	11,100	88,800	\$0.04	\$3,761	\$7,320	\$7,320	\$7,320	\$31,624
Smart Financing - New Building	0	1	n/a	\$0	7,650	7,650	\$0.04	\$327	\$0	n/a	\$0	\$327
TOTAL COMMERCIAL PROGRAMS	101	515		\$9,743		96,450		\$4,088	\$7,320	\$3,660	\$10,980	\$108,811
INDUSTRIAL PROGRAMS - (WEST. Opt-Outs Removed)												
Smart Audit - Class 1	18	37	\$524.22	\$9,436	0	0			\$0	\$472	\$472	\$9,908
Smart Audit - Class 2	0	3	n/a	\$1,094	0	0			\$0	\$55	\$55	\$1,149
Smart Financing - General	0	0	n/a	\$11,802	14,625	0	\$0.04	\$0	\$0	n/a	\$0	\$11,802
Smart Financing - Compressed Air System	0	0	n/a	\$0	41,200	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	18	40		\$22,332		0		\$0	\$0	\$527	\$527	\$22,859
TOTAL COMPANY	1,016	4,932		\$396,819		2,157,937		\$66,246	\$21,821	\$9,000	\$31,701	\$456,766
* Lost revenue and efficiency incentives are based on prospective values.												

1998	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (1)(3)	NET LOST REV/6 MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/6 MOS (2)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOST REVENUES (6)(7)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 3 (1st HALF)												
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	COSTS (4)	(KWH/PARTIC) (5)	KWH/6 MOS (2)(5)	(\$/KWH) (7)		(EX. C, PG.21C) (9)	(5% of COSTS) (10)	(9)+(10)	(12)
RESIDENTIAL PROGRAMS												
Energy Fitness	544	1,768	\$184.44	\$100,304	682	1,205,776	\$0.03	\$37,524	\$11,304	n/a	\$11,304	\$149,162
Targeted Energy Efficiency - All Electric	122	565	\$1,132.92	\$138,216	2,784	1,572,990	\$0.03	\$48,935	\$6,911	n/a	\$6,911	\$194,052
- Non-All Electric	24	203	\$112.92	\$2,710	340	69,020	\$0.03	\$2,156	\$40	n/a	\$40	\$4,905
Compact Fluorescent Bulb	0	289	\$0.00	\$0	32	8,608	\$0.03	\$266	\$0	\$0	\$0	\$266
High - Efficiency Heat Pump - Resistance Heat	21	687	\$70.10	\$1,472	1,094	970,378	\$0.03	\$30,218	\$152	n/a	\$152	\$31,842
- Non Resistance Heat	26	848	\$70.00	\$1,820	442	314,816	\$0.03	\$11,579	\$157	n/a	\$157	\$14,286
High - Efficiency Heat Pump - Mobile Home	66	616	\$535.30	\$35,330	1,250	770,000	\$0.03	\$23,947	\$2,145	n/a	\$2,145	\$61,422
Mobile Home New Construction	0	82	n/a	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	803	5,236		\$279,882		4,971,588		\$154,725	\$14,398	\$6,911	\$21,309	\$455,916
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	204	597	\$194.13	\$39,602	0	0	n/a	\$0	\$1,980	\$1,980	\$1,980	\$41,582
- Class 2	28	60	\$1,600.00	\$44,800	0	0	n/a	\$0	\$2,240	\$2,240	\$2,240	\$47,040
Smart Financing - Existing Building	8	15	\$5,561.50	\$44,652	22,200	365,200	\$0.04	\$15,043	\$6,505	n/a	\$6,505	\$66,201
Smart Financing - New Building	1	1	\$4,564.00	\$4,564	15,300	15,300	\$0.04	\$654	\$29	\$0	\$29	\$5,247
TOTAL COMMERCIAL PROGRAMS	241	674		\$133,618		370,500		\$15,697	\$5,535	\$4,220	\$10,755	\$160,070
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	12	51	\$246.08	\$2,953	0	0	n/a	\$0	\$148	\$148	\$148	\$3,101
Smart Audit - Class 2	1	3	\$1,800.00	\$1,800	0	0	n/a	\$0	\$90	\$90	\$90	\$1,890
Smart Financing - General	0	0	\$0.00	\$1,338	29,250	0	\$0.04	\$0	\$67	\$67	\$67	\$1,405
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	13	54		\$6,091	0	0		\$0	\$305	\$305	\$305	\$6,396
TOTAL COMPANY	1,057	5,956		\$419,591		5,342,058		\$170,422	\$20,933	\$11,436	\$32,369	\$622,382
* Lost revenue and efficiency incentives are based on prospective values.												

Exhibit C
PAGE 4A of 22

1998												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR (2nd HALF)	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV#6 MOS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH#6 MOS (2)(X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG.2)(C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)(4)(X)(3%)	TOTAL * INCENTIVE (11)(9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)(4)+(10)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	448	2,277	\$201.30	\$134,982	682	1,552,914	\$0.03	\$40,327	\$9,309	\$0	\$9,309	\$192,618
Targeted Energy Efficiency - All Electric	131	697	\$1,187.51	\$155,564	2,784	1,940,448	\$0.03	\$60,367	\$7,778	\$0	\$7,778	\$223,709
- Non-All Electric	42	238	\$139.62	\$5,964	340	80,920	\$0.03	\$2,528	\$70	\$0	\$70	\$8,462
Compact Fluorescent Bulb	0	269	\$0.00	\$0	32	8,608	\$0.03	\$266	\$0	\$0	\$0	\$266
High - Efficiency Heat Pump - Resistance Heat	106	940	\$147.45	\$15,925	1,084	1,028,360	\$0.03	\$32,023	\$780	\$0	\$780	\$48,728
- Non Resistance Heat	64	894	\$72.27	\$4,625	442	395,148	\$0.03	\$12,313	\$1,653	\$0	\$1,653	\$18,801
High - Efficiency Heat Pump - Mobile Home	173	764	\$514.50	\$89,009	1,250	955,000	\$0.03	\$28,701	\$5,623	\$0	\$5,623	\$124,333
Mobile Home New Construction	33	11	\$549.45	\$18,132	0	0	n/a		\$0	\$907	\$907	\$19,039
TOTAL RESIDENTIAL PROGRAMS	999	6,000		\$424,101		5,961,398		\$165,525	\$17,645	\$8,685	\$26,330	\$635,956
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	178	795	\$534.85	\$95,203	0	0	n/a		\$0	\$4,760	\$4,760	\$98,963
Smart Audit - Class 2	9	73	\$2,800.00	\$25,200	0	0	n/a		\$0	\$1,260	\$1,260	\$28,460
Smart Financing - Existing Building	29	32	\$1,878.86	\$54,487	22,200	710,400	\$0.04	\$30,085	\$23,585	\$0	\$23,585	\$108,157
Smart Financing - New Building	5	6	\$1,529.20	\$7,646	15,300	91,800	\$0.04	\$3,926	\$144	\$0	\$144	\$11,716
TOTAL COMMERCIAL PROGRAMS	221	906		\$182,536		802,200		\$34,011	\$23,729	\$6,020	\$29,749	\$246,286
INDUSTRIAL PROGRAMS - (WEST, Opt-Outs Removed)												
Smart Audit - Class 1	3	59	\$852.33	\$2,557	0	0	n/a		\$0	\$128	\$128	\$2,685
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a		\$0	\$0	\$0	\$0
Smart Financing - General	1	0	\$0.00	\$2,430	29,250	0	\$0.04	\$0	\$383	\$0	\$383	\$2,813
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	82,400	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	4	63		\$4,987		0		\$0	\$383	\$128	\$511	\$5,498
TOTAL COMPANY	1,224	7,059		\$611,624		6,763,598		\$219,536	\$41,757	\$14,833	\$56,990	\$687,750

* Lost revenue and efficiency incentives are based on prospective values.

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (1st HALF)												
Exhibit C PAGE 5A of 22												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (2X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET • REVENUES (6)(X)(7)	EFFICIENCY INCENTIVE (EX. C, PG.2)(C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE (9)(X)(10)	TOTAL EST. COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	306	2,694	\$312.58	\$95,650	707	1,904,658	\$0.03	\$99,273	\$10,370	\$0	\$10,370	\$165,293
Tangeded Energy Efficiency - All Electric	75	773	\$1,907.41	\$143,056	630	486,990	\$0.03	\$15,150	\$0	\$7,153	\$7,153	\$165,359
- Non-All Electric	12	249	\$112.00	\$1,344	306	76,194	\$0.03	\$2,380	\$60	\$0	\$60	\$3,784
Compact Fluorescent Bulb	0	269	\$0.00	\$0	31	8,239	\$0.03	\$258	\$0	\$0	\$0	\$258
High - Efficiency Heat Pump - Resistance Heat	99	1,002	\$273.74	\$27,100	1,200	1,202,400	\$0.03	\$37,443	\$4,375	\$0	\$4,375	\$68,918
- Non Resistance Heat	2	853	\$60.00	\$100	442	377,026	\$0.03	\$11,748	\$0	\$5	\$5	\$11,853
High - Efficiency Heat Pump - Mobile Home	101	826	\$545.99	\$55,145	1,475	1,218,350	\$0.03	\$37,891	\$6,505	\$0	\$6,505	\$101,541
Mobile Home New Construction ***	98	45	\$587.20	\$57,546	1,756	79,020	\$0.03	\$2,458	\$4,353	\$0	\$4,353	\$64,357
TOTAL RESIDENTIAL PROGRAMS	693	6,711		\$379,841		5,352,977		\$166,601	\$27,663	\$7,158	\$34,821	\$587,363
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	186	964	\$204.71	\$38,076	0	0	n/a	0	\$0	\$1,904	\$1,904	\$39,980
- Class 2	16	87	\$2,705.00	\$43,280	0	0	n/a	0	\$0	\$2,164	\$2,164	\$45,444
Smart Financing - Existing Building	6	51	\$5,109.67	\$30,658	13,282	677,392	\$0.04	\$28,687	\$1,395	\$0	\$1,395	\$60,740
Smart Financing - New Building	3	9	\$0.00	\$2,350	14,101	126,909	\$0.04	\$5,428	\$787	\$0	\$787	\$8,565
TOTAL COMMERCIAL PROGRAMS	211	1,111		\$114,364		804,291		\$34,115	\$2,182	\$4,058	\$6,250	\$154,729
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	60	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	n/a	0	\$0	\$0	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	65		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	904	7,920		\$494,305		6,215,216		\$200,716	\$29,845	\$11,226	\$41,071	\$736,092

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/96.
 *** Participants since 09/01/98.

1999												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 4 (2nd HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH-HALF (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8)	EFFICIENCY INCENTIVE (EX C, PG.21C) (9)	MAXIMIZING INCENTIVE (% of COSTS) (10)	TOTAL* INCENTIVE (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)+(9)+(11) (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,519	\$0.00	\$972	707	1,780,933	\$0.03	\$55,423	\$0	0%	\$0	\$55,423
Targeted Energy Efficiency - All Electric	66	700	\$1,222.76	\$90,702	630	441,000	\$0.03	\$13,720	\$4,035	4%	\$4,035	\$17,755
- Non-All Electric	8	220	\$67.50	\$540	306	67,320	\$0.03	\$2,103	\$40	0%	\$40	\$2,143
Compact Fluorescent Bulb	0	123	\$0.00	\$0	31	3,813	\$0.03	\$118	\$0	0%	\$0	\$118
High - Efficiency Heat Pump - Resistance Heat	140	810	\$211.14	\$29,560	1,200	972,000	\$0.03	\$36,288	\$6,187	3%	\$6,187	\$42,475
- Non Resistance Heat	0	593	\$0.00	\$0	447	285,071	\$0.03	\$9,260	\$0	0%	\$0	\$9,260
High - Efficiency Heat Pump - Mobile Home	134	739	\$599.07	\$72,236	1,475	1,090,025	\$0.03	\$33,900	\$11,284	10%	\$11,284	\$45,184
Mobile Home New Construction ***	123	196	\$681.42	\$71,515	1,755	343,980	\$0.03	\$10,698	\$5,464	5%	\$5,464	\$16,162
TOTAL RESIDENTIAL PROGRAMS	471	5,900		\$255,625		4,964,142		\$154,430	\$22,975		\$27,010	\$437,025
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	188	1,129	\$356.11	\$66,948	0	0	N/A	\$0	\$3,347	0%	\$3,347	\$70,295
- Class 2	21	103	\$2,705.00	\$56,805	0	0	N/A	\$0	\$2,840	0%	\$2,840	\$59,645
Smart Financing - Existing Building	25	66	\$2,726.04	\$68,151	13,282	875,612	\$0.04	\$37,125	\$5,814	7%	\$5,814	\$111,090
Smart Financing - New Building	8	13	\$3,087.00	\$24,696	14,101	183,313	\$0.04	\$7,840	\$2,099	2%	\$2,099	\$34,635
TOTAL COMMERCIAL PROGRAMS	242	1,311		\$216,600		1,059,925		\$44,965	\$7,913		\$14,100	\$276,665
INDUSTRIAL PROGRAMS - (W/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	57	\$0.00	\$0	0	0	N/A	\$0	\$0	0%	\$0	\$0
Smart Audit - Class 2	0	4	\$0.00	\$0	0	0	N/A	\$0	\$0	0%	\$0	\$0
Smart Financing - General	0	1	\$0.00	\$0	0	0	\$0.04	\$0	\$0	0%	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.04	\$0	\$0	0%	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	62		\$0		0		\$0	\$0		\$0	\$0
TOTAL COMPANY	713	7,273		\$472,125		6,024,067		\$199,465	\$30,888		\$41,110	\$712,690

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/96.
 *** Participants since 09/01/98.

Year 2000												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 5 (1st half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/HALF (2)X(5) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* LOST REVENUES (6)X(7) (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (9)+(10) (11)	TOTAL EST. COSTS TO BE RECOVERED (4)+(8)+(11) (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	2,161	\$0.00	\$0	707	1,527,827	\$0.03	\$47,546	\$0	\$0	\$0	\$47,546
Targeted Energy Efficiency - All Electric	65	659	\$1,272.61	\$83,992	630	415,170	\$0.03	\$12,916	\$0	\$4,200	\$4,200	\$101,108
- Non-All Electric	23	202	\$90.82	\$2,543	205	61,812	\$0.03	\$1,931	\$141	\$0	\$141	\$4,615
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	36	663	\$200.00	\$7,600	1,200	819,600	\$0.03	\$25,522	\$1,679	\$0	\$1,679	\$34,801
- Non Resistance Heat	0	348	\$0.00	\$0	447	155,566	\$0.03	\$4,847	\$0	\$0	\$0	\$4,847
High - Efficiency Heat Pump - Mobile Home	45	663	\$500.00	\$22,500	1,475	1,007,425	\$0.03	\$31,331	\$3,789	\$0	\$3,789	\$57,620
Mobile Home New Construction ***	101	302	\$500.20	\$50,550	1,755	530,010	\$0.03	\$16,483	\$4,486	\$0	\$4,486	\$74,519
TOTAL RESIDENTIAL PROGRAMS	276	5,038		\$170,185		4,517,400		\$140,576	\$10,095	\$4,200	\$14,295	\$325,056
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	144	1,126	\$397.19	\$57,195	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	8	112	\$2,705.00	\$21,640	0	0	n/a	\$0	\$1,062	\$0	\$1,062	\$60,055
Smart Financing - Existing Building	16	86	\$1,307.31	\$20,917	13,282	1,142,252	\$0.04	\$48,374	\$3,721	\$0	\$3,721	\$73,012
Smart Financing - New Building	4	20	\$5,298.75	\$25,195	14,101	282,020	\$0.04	\$12,062	\$1,049	\$0	\$1,049	\$38,305
TOTAL COMMERCIAL PROGRAMS	172	1,344		\$124,947		1,424,272		\$60,436	\$4,770	\$3,942	\$8,712	\$184,095
INDUSTRIAL PROGRAMS - (w/Est. On-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	450	6,382		\$295,132		5,941,672		\$200,012	\$14,865	\$8,142	\$23,007	\$519,151

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/97.
 *** Participants since 09/01/98

Year 2000	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACT. PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21(C)) (9)	MAXIMIZING INCENTIVE (% of COSTS) (10)	INCENTIVE RECOVERED (11)	TOTAL EST. COSTS TO BE RECOVERED (12)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 5 (2nd half)												
PROGRAM DESCRIPTIONS												
RESIDENTIAL PROGRAMS												
Energy Fitness	0	1,525	\$0.00	\$0	765	1,075,650	\$0.03	\$33,505	\$0	\$0	\$0	\$33,505
Targeted Energy Efficiency - All Electric	99	563	\$1,115.41	\$110,426	630	367,280	\$0.03	\$11,426	\$0	\$5,521	\$5,521	\$127,373
- Non-All Electric	21	170	\$94.67	\$1,988	306	52,020	\$0.03	\$1,625	\$105	\$0	\$105	\$3,718
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	25	481	\$200.00	\$5,000	1,200	577,200	\$0.03	\$17,974	\$1,105	\$0	\$1,105	\$24,079
- Non Resistance Heat	0	147	\$0.00	\$0	446	65,562	\$0.03	\$2,043	\$0	\$0	\$0	\$2,043
High - Efficiency Heat Pump - Mobile Home	43	572	\$495.35	\$21,300	1,476	844,272	\$0.03	\$26,257	\$3,621	\$0	\$3,621	\$51,178
Mobile Home New Construction ***	94	403	\$575.00	\$54,050	1,755	707,265	\$0.03	\$21,936	\$4,175	\$0	\$4,175	\$80,221
TOTAL RESIDENTIAL PROGRAMS	282	3,881	\$192,764	\$192,764		3,890,259		\$114,826	\$9,006	\$5,521	\$14,527	\$222,117
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	159	1,026	\$165.24	\$26,273	0	0	n/a	\$0	\$0	\$1,314	\$1,314	\$27,687
- Class 2	29	98	\$2,705.00	\$78,445	0	0	n/a	\$0	\$0	\$3,922	\$3,922	\$82,367
Smart Financing - Existing Building	24	97	\$914.54	\$21,949	13,282	1,288,354	\$0.04	\$54,562	\$5,581	\$0	\$5,581	\$82,092
Smart Financing - New Building	0	21	\$0.00	\$7,269	14,102	296,142	\$0.04	\$12,665	\$0	\$0	\$0	\$19,935
TOTAL COMMERCIAL PROGRAMS	212	1,242	\$133,936	\$133,936		1,584,496		\$67,228	\$5,581	\$5,236	\$10,917	\$211,981
INDUSTRIAL PROGRAMS - (WEST. Opt-Out Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	494	5,123	\$325,700	\$325,700		5,274,755		\$182,054	\$14,587	\$10,757	\$25,344	\$534,098
* Lost revenue and efficiency incentives are based on prospective values. ** Cumulative participants include a reduction for the cumulative participants as of 12/31/97. *** Participants since 09/01/96.												

Exhibit C
PAGE 69 of 22

Year 2001												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (1)(X)(3)	NET LOST REV/GTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH-HALF (2)(X)(5)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET * LOST REVENUES (8)(X)(7)	EFFICIENCY INCENTIVE (EX C PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)(4)(X)(5%)	TOTAL * INCENTIVE (9)+(10)	TOTAL EST. COSTS TO BE RECOVERED (12)(4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	1,044	\$0.00	\$0	707	738,108	\$0.03112	\$22,870	\$0	\$0	\$0	\$22,870
Targeted Energy Efficiency - All Electric	62	535	\$1,276.94	\$79,170	600	337,050	\$0.03111	\$10,486	\$0	\$3,959	\$3,959	\$93,615
- Non-All Electric	18	137	\$67.89	\$1,582	306	41,922	\$0.03124	\$1,310	\$0	\$0	\$0	\$2,882
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	23	438	\$201.04	\$4,624	1200	525,600	\$0.03114	\$16,367	\$1,016	\$0	\$1,016	\$22,007
High - Efficiency Heat Pump - Mobile Home	53	558	\$472.15	\$25,024	1475	823,050	\$0.03110	\$25,597	\$4,463	\$0	\$4,463	\$55,084
Mobile Home New Construction ***	83	488	\$537.04	\$44,574	1755	856,440	\$0.03110	\$26,635	\$3,687	\$0	\$3,687	\$74,896
TOTAL RESIDENTIAL PROGRAMS	239	3,281		\$154,974		3,356,377		\$104,493	\$9,256		\$13,215	\$272,682
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	134	1,017	\$321.82	\$43,124	0	0	n/a	\$0	\$0	\$2,156	\$2,156	\$45,280
- Class 2	28	105	\$1,510.00	\$42,280	0	0	n/a	\$0	\$0	\$2,114	\$2,114	\$44,394
Smart Financing - Existing Building	15	112	\$2,309.00	\$34,635	13,282	1,487,584	\$0.04235	\$62,999	\$3,488	\$0	\$3,488	\$101,122
Smart Financing - New Building	6	25	\$4,016.13	\$32,129	14,101	352,525	\$0.04277	\$15,077	\$2,099	\$0	\$2,099	\$49,305
TOTAL COMMERCIAL PROGRAMS	185	1,259		\$152,168		1,840,109		\$78,076	\$5,657		\$8,857	\$240,101
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0		\$0	\$0
TOTAL COMPANY	424	4,540		\$307,142		5,199,486		\$182,559	\$14,843		\$23,072	\$512,783

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/90.
 *** Participants since 01/01/95.

Year 2001												
KENTUCKY POWER COMPANY												
ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACT. PROGRAM COSTS (1)X(3)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/HALF (2)X(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (6)X(7)	EFFICIENCY INCENTIVE (EX C PG-2(C)) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (4)X(9)	TOTAL * INCENTIVE (9)+1(10)	TOTAL EST. COSTS TO BE RECOVERED (12) (4)+9+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	535	\$0.00	\$0	705	377,710	\$0.03112	\$11,754	\$0	\$0	\$0	\$11,754
Targeted Energy Efficiency - All Electric	88	486	\$1,018.06	\$89,660	630	305,100	\$0.03111	\$9,525	\$0	\$4,483	\$4,483	\$103,668
- Non-All Electric	46	122	\$81.46	\$5,747	306	37,332	\$0.03124	\$1,166	\$231	\$0	\$231	\$5,144
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat	30	412	\$173.33	\$5,200	1,200	494,400	\$0.03114	\$15,396	\$1,326	\$0	\$1,326	\$21,922
- Non-Resistance Heat	0	35	\$0.00	\$0	446	15,610	\$0.03116	\$486	\$0	\$0	\$0	\$486
High - Efficiency Heat Pump - Mobile Home	47	469	\$510.64	\$24,000	1,476	692,244	\$0.03110	\$21,529	\$3,958	\$0	\$3,958	\$49,487
Mobile Home New Construction ***	92	568	\$555.43	\$51,100	1,755	996,840	\$0.03110	\$31,002	\$4,087	\$0	\$4,087	\$66,189
TOTAL RESIDENTIAL PROGRAMS	303	2,627		\$173,707		2,920,316		\$90,858	\$9,602	\$4,483	\$14,085	\$278,650
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	131	966	\$454.04	\$59,479	0	0	n/a	\$0	\$0	\$2,974	\$2,974	\$62,453
- Class 2	5	111	\$9,817.20	\$49,086	0	0	n/a	\$0	\$0	\$2,454	\$2,454	\$51,540
Smart Financing - Existing Building	15	109	\$1,664.27	\$24,964	13,282	1,447,738	\$0.04235	\$61,312	\$3,488	\$0	\$3,488	\$69,768
Smart Financing - New Building	18	34	\$1,798.28	\$32,387	14,102	479,488	\$0.04277	\$20,507	\$4,722	\$0	\$4,722	\$37,616
TOTAL COMMERCIAL PROGRAMS	169	1,220		\$165,916		1,927,206		\$81,819	\$8,210	\$5,428	\$13,638	\$261,373
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	472	3,847		\$339,623		4,847,522		\$172,677	\$17,812	\$9,911	\$27,723	\$540,023

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 1/23/1980
 *** Participants since 8/18/1980.

Exhibit C
 PAGE 7B of 22

Year 2002												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 7 (1st Half)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/HALF (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (6)X(7) (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	116	\$0.00	\$0	707	82,012	\$0.03112	\$2,552	\$0	\$0	\$0	\$2,552
Targeted Energy Efficiency - All Electric	63	442	\$1,752.40	\$110,401	1,028	454,376	\$0.03111	\$14,136	\$0	\$5,520	\$5,520	\$130,057
- Non-All Electric	32	135	\$65.47	\$2,095	315	42,525	\$0.03124	\$1,328	\$137	\$0	\$137	\$3,560
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	1	314	\$1,152.00	\$1,152	1,200	376,800	\$0.03114	\$11,734	\$44	\$0	\$44	\$12,930
High - Efficiency Heat Pump - Mobile Home	43	414	\$619.77	\$26,650	1,144	473,616	\$0.03110	\$14,729	\$1,244	\$0	\$1,244	\$42,623
Mobile Home New Construction ***	57	568	\$641.77	\$36,561	1,809	1,027,512	\$0.03110	\$31,966	\$231	\$0	\$231	\$68,768
TOTAL RESIDENTIAL PROGRAMS	196	1,989		\$176,879		2,456,841		\$76,435	\$1,656	\$5,520	\$7,176	\$260,490
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	125	923	\$432.92	\$54,115	0	0	n/a	\$0	\$0	\$2,706	\$2,706	\$56,821
- Class 2	8	104	\$3,711.00	\$29,688	0	0	n/a	\$0	\$0	\$1,484	\$1,484	\$31,172
Smart Financing - Existing Building	7	101	\$2,552.71	\$17,869	13,282	1,341,482	\$0.04235	\$56,812	\$1,628	\$0	\$1,628	\$76,309
Smart Financing - New Building	5	42	\$1,394.60	\$6,973	14,101	592,242	\$0.04277	\$25,330	\$1,312	\$0	\$1,312	\$33,615
TOTAL COMMERCIAL PROGRAMS	145	1,170		\$108,645		1,933,724		\$82,142	\$2,940	\$4,190	\$7,130	\$197,917
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	341	3,159		\$285,524		4,390,565		\$158,577	\$4,596	\$9,710	\$14,306	\$458,407

Exhibit C
 PAGE 8A of 22

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/1999.
 *** Participants since 01/01/1999.

Year 2002												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
Exhibit C PAGE 8B of 22												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOSS (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOSS REVENUE (\$/KWH) (7)	TOTAL NET * LOSS REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE RECOVERED (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency - All Electric	76	467	\$1,059.33	\$78,989	1,028	469,766	\$0.03111	\$14,615	\$0	\$3,949	\$3,949	\$97,553
- Non-All Electric	13	156	\$65.92	\$1,117	315	48,140	\$0.03124	\$1,595	\$56	\$0	\$56	\$2,708
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Resistance Heat - Non Resistance Heat	0	177	\$0.00	(\$352)	1,200	212,400	\$0.03114	\$6,614	\$0	\$0	\$0	\$6,262
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump - Mobile Home	43	308	\$603.84	\$25,965	1,144	352,352	\$0.03110	\$10,958	\$1,244	\$0	\$1,244	\$38,167
Mobile Home New Construction ***	61	519	\$644.46	\$39,312	1,809	938,871	\$0.03110	\$29,199	\$248	\$0	\$248	\$68,759
TOTAL RESIDENTIAL PROGRAMS	193	1,617		\$145,031		2,022,559		\$62,921	\$1,548	\$3,949	\$5,497	\$213,449
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	766	\$0.00	\$74,422	0	0	n/a	\$0	\$0	\$3,721	\$3,721	\$78,143
- Class 2	0	90	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	25	97	\$909.76	\$22,744	13,282	1,288,354	\$0.04235	\$54,562	\$5,814	\$0	\$5,814	\$69,120
Smart Financing - New Building	16	44	\$2,424.94	\$38,799	14,102	620,488	\$0.04277	\$26,538	\$4,197	\$0	\$4,197	\$69,534
TOTAL COMMERCIAL PROGRAMS	41	1,017		\$135,965		1,908,842		\$81,100	\$10,011	\$3,721	\$13,732	\$230,797
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	234	2,634		\$280,996		3,931,401		\$144,021	\$11,559	\$7,670	\$19,229	\$444,246

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/1999.
 *** Participants since 07/01/1998.

Year 2003												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 8 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (9)(X)(7)	EFFICIENCY INCENTIVE (EX. C. PG.2)(C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE TOTAL * (9)+(10)	EXHIBIT C PAGE 9A of 22
RESIDENTIAL PROGRAMS												TOTAL COSTS TO BE RECOVERED (12)
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	RECOVERED (12) (4)+(9)+(11)
Targeted Energy Efficiency												
- All Electric	100	467	\$849.84	\$84,984	1,028	460,076	\$0.03111	\$14,935	\$0	\$4,249	\$4,249	\$104,168
- Non-All Electric	7	151	\$79.29	\$555	314	47,414	\$0.03124	\$1,481	\$0	\$0	\$0	\$2,066
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	112,800	\$0.03114	\$3,513	\$0	\$0	\$0	\$3,513
- Resistance Heat	0	94	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	1,144	306,592	\$0.03110	\$9,555	\$993	\$0	\$993	\$23,418
High - Efficiency Heat Pump	34	268	\$379.41	\$12,900	1,808	831,680	\$0.03110	\$25,665	\$187	\$0	\$187	\$48,252
- Mobile Home	0	0	\$0.00	\$0	157	0	\$0.03124	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction ***	46	460	\$482.61	\$22,200	1,194	27,462	\$0.03116	\$956	\$2,127	\$0	\$2,127	\$17,398
- Heat Pump	0	0	\$0.00	\$0	1,463	1,806,024		\$66,185	\$3,327	\$4,249	\$7,576	\$198,815
- Air Conditioner	101	23	\$142.72	\$14,415								
Modified Energy Fitness	288	1,463	\$135.054									
TOTAL RESIDENTIAL PROGRAMS												
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	620	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
- Class 2	0	73	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	110	\$0.00	\$0	13,282	1,461,020	\$0.04235	\$61,874	\$0	\$0	\$0	\$61,874
Smart Financing - New Building	0	49	\$0.00	\$0	14,101	660,949	\$0.04277	\$29,552	\$0	\$0	\$0	\$29,552
TOTAL COMMERCIAL PROGRAMS	0	852	\$0	\$0		2,151,969		\$91,426	\$0	\$0	\$0	\$91,426
INDUSTRIAL PROGRAMS - (WEST. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	288	2,315	\$135.054	\$135,054		3,957,993		\$147,611	\$3,327	\$4,249	\$7,576	\$280,241

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2000.
 *** Participants since 01/01/2000.

Year 2003												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 8 (2nd HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/HALF (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * LOSS (6)X(7)	EFFICIENCY INCENTIVE (EX. C. PG.2(C)) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE TOTAL * (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	69	473	\$974.94	\$67,271	1,028	486,244	\$0.03111	\$15,127	\$0	\$3,364	\$3,364	\$85,762
- Non-All Electric	69	167	\$76.10	\$5,251	316	52,772	\$0.03124	\$1,649	\$295	\$0	\$295	\$7,195
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.03114	\$2,354	\$0	\$0	\$0	\$2,354
- Resistance Heat	0	63	\$0.00	\$0	1,200	75,600	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	29	256	\$453.45	\$13,150	1,144	292,864	\$0.03110	\$9,108	\$839	\$0	\$839	\$23,097
- Mobile Home												
Mobile Home New Construction **												
- Heat Pump	64	419	\$649.59	\$41,574	1,810	758,390	\$0.03110	\$23,586	\$260	\$0	\$260	\$65,420
- Air Conditioner	1	0	\$150.00	\$150	158	0	\$0.03124	\$0	\$0	\$0	\$0	\$150
Modified Energy Fitness	441	324	\$431.43	\$190,282	1,194	386,856	\$0.03116	\$12,054	\$9,287	\$0	\$9,287	\$211,603
TOTAL RESIDENTIAL PROGRAMS	673	1,702		\$517,658		2,052,726		\$63,878	\$10,681	\$3,364	\$14,045	\$395,581
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	453	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	63	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	77	\$0.00	\$0	13,282	1,022,714	\$0.04235	\$43,312	\$0	\$0	\$0	\$43,312
Smart Financing - New Building	0	47	\$0.00	\$0	14,102	662,794	\$0.04277	\$28,348	\$0	\$0	\$0	\$28,348
TOTAL COMMERCIAL PROGRAMS	0	640		\$0		1,685,508		\$71,660	\$0	\$0	\$0	\$71,660
INDUSTRIAL PROGRAMS - (West, Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	673	2,342		\$517,658		3,738,234		\$135,538	\$10,681	\$3,364	\$14,045	\$467,241

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2000.
 *** Participants since 07/01/2000.

Year 2004												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE TOTAL * (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
												(4)+(9)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Energy Fitness												
Targeted Energy Efficiency												
- All Electric	72	463	\$751.54	\$54,111	1,028	475,964	\$0.03111	\$14,807	\$0	\$2,706	\$2,706	\$71,624
- Non-All Electric	10	179	\$78.60	\$786	314	56,206	\$0.03124	\$1,756	\$43	\$0	\$43	\$2,565
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	42	\$0.00	\$0	1,200	50,400	\$0.03114	\$1,669	\$0	\$0	\$0	\$1,569
- Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat												
High - Efficiency Heat Pump	41	247	\$428.05	\$17,550	1,144	282,568	\$0.03110	\$8,788	\$1,186	\$0	\$1,186	\$27,524
- Mobile Home												
Mobile Home New Construction ***												
- Heat Pump	68	394	\$503.68	\$34,250	1,808	712,352	\$0.03110	\$22,154	\$276	\$0	\$276	\$56,680
- Air Conditioner	1	1	\$150.00	\$150	137	137	\$0.03124	\$5	\$0	\$0	\$0	\$155
Modified Energy Fitness	334	735	\$417.76	\$139,531	1,194	877,590	\$0.03116	\$27,346	\$7,034	\$0	\$7,034	\$173,911
TOTAL RESIDENTIAL PROGRAMS	526	2,061		\$246,378		2,455,237		\$76,425	\$8,539	\$2,706	\$11,245	\$334,048
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	338	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	30	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	54	\$0.00	\$0	13,282	717,228	\$0.04235	\$30,375	\$0	\$0	\$0	\$30,375
Smart Financing - New Building	0	43	\$0.00	\$0	14,101	606,343	\$0.04277	\$25,933	\$0	\$0	\$0	\$25,933
TOTAL COMMERCIAL PROGRAMS	0	465		\$0		1,323,571		\$56,308	\$0	\$0	\$0	\$56,308
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	526	2,526		\$246,378		3,778,808		\$132,733	\$8,539	\$2,706	\$11,245	\$390,356

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2001.
 *** Participants since 01/01/2001.

Exhibit C
 PAGE 10A of 22

Year 2004												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (1)(X)(3)	NET LOST REV/QTR (KWH/PARTIC) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE TOTAL * (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	69	462	\$1,118.43	\$99,540	1,028	474,936	\$0.03111	\$14,775	\$0	\$4,977	\$4,977	\$119,292
- Non-All Electric	72	205	\$60.60	\$4,363	316	64,760	\$0.03124	\$2,024	\$308	\$0	\$308	\$6,695
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	15	\$0.00	\$0	1,200	18,000	\$0.03114	\$51	\$0	\$0	\$0	\$51
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	46	239	\$469.57	\$21,600	1,144	273,416	\$0.03110	\$8,503	\$1,330	\$0	\$1,330	\$31,433
Mobile Home New Construction ***												
- Heat Pump	70	379	\$597.14	\$41,800	1,810	685,990	\$0.03110	\$21,934	\$284	\$0	\$284	\$63,418
- Air Conditioner	0	2	#DNV/0	\$0	159	316	\$0.03124	\$10	\$0	\$0	\$0	\$10
Modified Energy Fitness	391	1,070	\$347.20	\$135,756	1,194	1,277,580	\$0.03116	\$39,809	\$9,234	\$0	\$9,234	\$183,799
TOTAL RESIDENTIAL PROGRAMS	668	2,372		\$303,059		2,795,018		\$97,016	\$10,156	\$4,977	\$15,133	\$405,208
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	191	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	10	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	41	\$0.00	\$0	13,282	544,562	\$0.04235	\$23,062	\$0	\$0	\$0	\$23,062
Smart Financing - New Building	0	30	\$0.00	\$0	14,102	423,060	\$0.04277	\$18,094	\$0	\$0	\$0	\$18,094
TOTAL COMMERCIAL PROGRAMS	0	272		\$0		967,622		\$41,156	\$0	\$0	\$0	\$41,156
INDUSTRIAL PROGRAMS - (West. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	668	2,644		\$303,059		3,762,640		\$128,172	\$10,156	\$4,977	\$15,133	\$446,364

* Last revenue and efficiency incentives are based on prospective values.

** Cumulative participants include a reduction for the cumulative participants as of 12/31/2001.

*** Participants since 07/01/2001.

Year 2005												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVQTR (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/HALF (2)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (6)(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE TOTAL* (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	88	477	\$1,109,22	\$97,611	866	427,392	\$0.03111	\$13,296	\$0	\$4,881	\$4,881	\$115,788
- All Electric	57	218	\$62,47	\$3,561	287	56,206	\$0.03124	\$1,818	\$1,125	\$0	\$1,125	\$6,504
- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	34	231	\$560,21	\$19,047	1,145	264,495	\$0.03110	\$8,226	\$2,693	\$0	\$2,693	\$29,966
- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction ***	67	371	\$614,85	\$41,195	1,808	670,768	\$0.03110	\$20,861	\$8,372	\$0	\$8,372	\$70,428
- Heat Pump	0	2	\$0.00	\$0	157	314	\$0.03124	\$10	\$0	\$0	\$0	\$10
- Air Conditioner	371	1,479	\$400,87	\$148,723	613	906,627	\$0.03116	\$28,250	\$15,612	\$0	\$15,612	\$192,595
Modified Energy Fitness	617	2,778	\$310,137	\$310,137	2,327,802	2,327,802	\$0.03116	\$72,461	\$27,802	\$4,881	\$32,683	\$415,281
TOTAL RESIDENTIAL PROGRAMS												
COMMERCIAL PROGRAMS	0	64	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	3	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	29	\$0.00	\$0	13,282	385,178	\$0.04235	\$16,312	\$0	\$0	\$0	\$16,312
Smart Financing - Existing Building	0	18	\$0.00	\$0	14,101	253,818	\$0.04277	\$10,856	\$0	\$0	\$0	\$10,856
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	114	\$0	\$0	14,101	638,996	\$0.04277	\$27,168	\$0	\$0	\$0	\$27,168
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	617	2,892	\$910,137	\$910,137	2,996,798	2,996,798	\$0.03116	\$99,629	\$27,802	\$4,881	\$32,683	\$442,449

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2002.
 *** Participants since 01/01/2002.

Year 2005													Exhibit C PAGE 11B of	22
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													TOTAL *	TOTAL ACTUAL COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/OTRS (KWH/ PARTICIPANT) (5)	TOTAL SAVINGS ENERGY HALF (6)	NET LOST REVENUE (KWH) (7)	TOTAL NET * LOST REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.2(C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	INCENTIVE RECOVERED (11)	INCENTIVE RECOVERED (12)		
RESIDENTIAL PROGRAMS			PER PARTICIPANT (3)	(1)(X)(3)	(KWH/ PARTICIPANT) (5)	(KWH/ PARTICIPANT) (6)	(7)	(8)	(9)	(10)	(11)	(12)		
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0		
Targeted Energy Efficiency														
- All Electric	65	492	\$1,207.52	\$102,639	696	440,832	\$0.03111	\$13,714	\$0	\$5,132	\$5,132	\$121,485		
- Non-All Electric	26	233	\$65.85	\$17,772	266	61,978	\$0.03124	\$1,936	\$0	\$513	\$513	\$4,161		
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0		
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	0	\$0.00	\$0	1,144	257,400	\$0.03110	\$8,005	\$3,168	\$0	\$0	\$30,244		
High - Efficiency Heat Pump	40	225	\$476.78	\$19,071	1,810	696,650	\$0.03110	\$21,672	\$10,372	\$0	\$0	\$77,215		
- Heat Pump	63	385	\$544.23	\$45,171	158	316	\$0.03124	\$10	\$0	\$0	\$0	\$10		
- Air Conditioner	0	2	\$0.00	\$0	612	1,117,512	\$0.03116	\$34,822	\$14,770	\$0	\$0	\$180,567		
Modified Energy Fitness	351	1,826	\$373.12	\$130,965	2,574,888			\$60,159	\$28,823	\$5,132	\$33,955	\$413,672		
TOTAL RESIDENTIAL PROGRAMS	585	3,163		\$299,558										
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0		
- Class 2	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	20	\$0.00	\$0	13,282	265,640	\$0.04239	\$11,259	\$0	\$0	\$0	\$11,250		
Smart Financing - New Building	0	11	\$0.00	\$0	14,102	155,122	\$0.04277	\$6,635	\$0	\$0	\$0	\$6,635		
TOTAL COMMERCIAL PROGRAMS	0	31		\$0		420,762		\$17,895	\$0	\$0	\$0	\$17,885		
INDUSTRIAL PROGRAMS - (West. Opt-Outs Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	N/A	\$0	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0		
TOTAL COMPANY	585	3,194		\$299,558		2,995,650		\$96,044	\$28,823	\$5,132	\$33,955	\$431,557		

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2002.
 *** Participants since 07/01/2002.

Year 2006												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 11 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)
			PER PARTICIPANT (3)	(1)X(3)	(KWH PARTICIPANT) (5)	(KWH HALF) (6)	(7)	(8)X(7)	(9)	(4)X(10)	(9)+(10)	(4)-(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0
Energy Fitness												
Targeted Energy Efficiency												
- All Electric	75	495	\$974.31	\$73,073	885	444,416	\$0.03111	\$13,826	\$0	\$3,654	\$3,654	\$90,553
- Non-All Electric	34	249	\$84.56	\$2,875	267	65,483	\$0.03124	\$2,077	\$671	\$0	\$671	\$5,623
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.03114	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	48	230	\$445.06	\$21,411	1,145	263,350	\$0.03110	\$8,190	\$3,802	\$0	\$3,802	\$33,403
- Mobile Home												
Mobile Home New Construction ***												
- Heat Pump	90	425	\$661.21	\$50,508	1,810	769,260	\$0.03110	\$23,924	\$11,246	\$0	\$11,246	\$65,679
- Air Conditioner	0	2	\$0.00	\$0	157	314	\$0.03124	\$10	\$0	\$0	\$0	\$10
Modified Energy Fitness	440	2,185	\$275.33	\$121,144	613	1,339,405	\$0.03116	\$41,736	\$18,515	\$0	\$18,515	\$187,395
TOTAL RESIDENTIAL PROGRAMS	687	3,567		\$269,012	2,883,218			\$69,763	\$34,234	\$3,654	\$37,888	\$395,663
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	687	3,587		\$269,012	2,883,218			\$69,763	\$34,234	\$3,654	\$37,888	\$395,663

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2003.
 *** Participants since 01/01/2003.

Year 2006													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 12B of 22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (1)X(3)	NET LOST REV/QTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (2)X(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* LOSS REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL* INCENTIVE (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
												(4)+(9)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	87	481	\$1,147.46	\$99,829	866	430,976	\$0.03111	\$13,408	\$0	\$4,991	\$4,991	\$18,228	
- Non-All Electric	46	264	\$94.00	\$3,864	266	67,564	\$0.03124	\$2,111	\$908	\$0	\$908	\$6,863	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat													
High - Efficiency Heat Pump													
- Mobile Home	45	245	\$460.00	\$20,700	1,144	280,260	\$0.03110	\$8,717	\$3,564	\$0	\$3,564	\$32,961	
Mobile Home New Construction **													
- Heat Pump	94	460	\$544.15	\$51,150	1,308	831,660	\$0.03110	\$25,865	\$11,746	\$0	\$11,746	\$88,761	
- Air Conditioner	0	2	\$0.00	\$0	198	316	\$0.03124	\$10	\$0	\$0	\$0	\$10	
Modified Energy Fitness	560	2,391	\$427.65	\$239,595	612	1,463,292	\$0.03116	\$45,596	\$23,565	\$0	\$23,565	\$308,757	
TOTAL RESIDENTIAL PROGRAMS	832	3,833		\$415,139		3,074,103		\$95,707	\$39,783	\$4,991	\$44,774	\$555,620	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	832	3,833		\$415,139		3,074,106		\$95,707	\$39,783	\$4,991	\$44,774	\$555,620	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 12/31/2003.
 *** Participants since 07/01/2003.

Year 2007													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (2X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
				(1)(X)(3)				(9)(X)(7)		(9)(X)(3%)	(9)(X)(10)	(9)(X)(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	707	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	128	295	\$1,022.27	\$130,851	899	264,320	\$0.04346	\$11,487	\$0	\$6,543	\$6,543	\$148,991	
- Non-All Electric	29	115	\$06.40	\$2,508	277	31,955	\$0.04362	\$1,390	\$572	\$0	\$572	\$4,470	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	447	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	50	153	\$450.00	\$22,500	1,145	175,185	\$0.04346	\$7,614	\$3,960	\$0	\$3,960	\$34,074	
- Mobile Home													
Mobile Home - New Construction ***													
- Heat Pump	84	304	\$563.10	\$47,300	1,810	550,240	\$0.04348	\$23,924	\$10,497	\$0	\$10,497	\$81,721	
- All Conditioner	0	0	\$0.00	\$0	157	0	\$0.04343	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	515	1,605	\$381.00	\$196,214	613	983,865	\$0.04349	\$42,788	\$21,671	\$0	\$21,671	\$260,673	
Case No 2005 - 00373, Dated December 14, 2006:													
- HEAP - Kentucky Power Company's Information Technology Implementation Costs				\$58,968								\$58,968	
- HEAP - KACAs Information Technology Implementation Costs				\$15,700								\$15,700	
TOTAL RESIDENTIAL PROGRAMS	806	2,472		\$474,041		2,005,465		\$87,203	\$36,700	\$6,543	\$43,243	\$604,487	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (w/EL On-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	806	2,472		\$474,041		2,005,465		\$87,203	\$36,700	\$6,543	\$43,243	\$604,487	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2006.
 *** Participants since 07/01/2006.

Year 2007													Exhibit C PAGE 13B of
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.2(C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)	
			PER PARTICIPANT (3)	(1X(3))		(2X(5))	(7)	(8X(7))		(4X(10))		(4)+(10)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	706	0	\$0.03112	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	100	421	\$879.82	\$87,982	896	377,216	\$0.04346	\$16,394	\$0	\$4,399	\$4,399	\$108,775	
- Non-All Electric	50	151	\$89.56	\$4,479	276	41,676	\$0.04362	\$1,818	\$987	\$0	\$987	\$7,284	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Resistance Heat	0	0	\$0.00	\$0	1,200	0	\$0.03114	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	446	0	\$0.03116	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	45	209	\$450.00	\$20,250	1,144	239,096	\$0.04346	\$10,391	\$3,564	\$0	\$3,564	\$34,205	
Mobile Home New Construction ***													
- Heat Pump	129	426	\$651.94	\$71,200	1,808	770,208	\$0.04348	\$33,489	\$16,120	\$0	\$16,120	\$120,609	
- Air Conditioner	0	0	\$0.00	\$0	158	0	\$0.04343	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	485	2,113	\$353.79	\$171,580	612	1,293,156	\$0.04349	\$66,239	\$20,409	\$0	\$20,409	\$248,238	
TOTAL RESIDENTIAL PROGRAMS	809	3,320		\$355,501		2,721,352		\$118,331	\$41,080	\$4,399	\$45,479	\$619,311	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (w/Est. Opt/Louis Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	809	3,320		\$355,501		2,721,352		\$118,331	\$41,080	\$4,399	\$45,479	\$619,311	
* Lost revenue and efficiency incentives are based on prospective values.													
** Cumulative participants include a reduction for the cumulative participants as of 06/30/2005.													
*** Participants since 07/01/2005.													

Year 2008												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 13 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (1)X(3) (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (6)	NET LOST REVENUE (S/KWH) (7)	TOTAL NET* REVENUES (6)X(7) (8)	EFFICIENCY INCENTIVE (EX. C. PG.2)(C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(5%)	TOTAL* INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	119	521	\$1,388.15	\$161,620	1,016	529,336	\$0.04346	\$23,005	\$9,189	\$0	\$9,189	\$183,814
- Non-All Electric	56	196	\$83.11	\$4,654	568	111,328	\$0.04345	\$4,837	\$3,454	\$0	\$3,454	\$12,945
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump												
- Mobile Home	61	252	\$457.38	\$27,900	875	220,500	\$0.04346	\$9,583	\$8,539	\$0	\$8,539	\$46,022
Mobile Home New Construction ***												
- Heat Pump	95	520	\$562.63	\$52,500	661	447,720	\$0.04348	\$19,467	\$10,597	\$0	\$10,597	\$82,564
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	560	2,512	\$361.32	\$202,339	435	1,196,220	\$0.04349	\$49,414	\$27,871	\$0	\$27,871	\$279,624
TOTAL RESIDENTIAL PROGRAMS	891	4,101	\$449,013	\$449,013	2,445,104			\$106,306	\$59,650	\$0	\$59,650	\$614,969
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0	\$0	\$0	0	0		\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	891	4,101	\$449,013	\$449,013	2,445,104			\$106,306	\$59,650	\$0	\$59,650	\$614,969

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 06/30/2005.
 *** Participants since 07/01/2005.

Year 2008													Exhibit C PAGE 149 of	22
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 13 (2nd HALF)														
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER ** (2)	TOTAL ESTIMATED PROGRAM COSTS PER PARTICIPANT (3)	TOTAL ACTUAL PROGRAM COSTS (1)X(3) (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ HALF (6) (2)X(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8) (6)X(7)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(5%)	TOTAL* INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)		
RESIDENTIAL PROGRAMS														
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Targeted Energy Efficiency														
- All Electric	89	545	\$991.21	\$88,218	1,016	553,720	\$0.04346	\$24,066	\$6,873	\$0	\$6,873	\$119,156		
- Non-All Electric	20	223	\$87.50	\$17,500	568	126,664	\$0.04345	\$5,504	\$1,234	\$0	\$1,234	\$8,488		
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump														
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump														
- Mobile Home	74	289	\$442.57	\$32,750	874	252,566	\$0.04346	\$10,977	\$10,359	\$0	\$10,359	\$54,066		
Mobile Home New Construction														
- Heat Pump	108	548	\$550.00	\$59,400	860	471,280	\$0.04348	\$20,481	\$12,047	\$0	\$12,047	\$91,938		
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Modified Energy Fitness	440	2,793	\$356.35	\$156,792	435	1,214,955	\$0.04349	\$52,838	\$21,899	\$0	\$21,899	\$231,529		
TOTAL RESIDENTIAL PROGRAMS	731	4,398		\$338,910		2,619,205		\$113,875	\$52,412	\$0	\$52,412	\$505,197		
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
- Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL COMMERCIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0		
INDUSTRIAL PROGRAMS - (West, Off-Office Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	n/a	n/a	\$0	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0		
TOTAL COMPANY	731	4,398		\$338,910		2,619,205		\$113,875	\$52,412	\$0	\$52,412	\$505,197		

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2006.

Year 2009													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE 15A of
													22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVENUE (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ HALF (6) (2X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8) (6)X(7)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(5%)	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(8)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	119	575	\$1,060.16	\$126,159	1,016	564,200	\$0.04346	\$25,389	\$9,189	\$0	\$9,189	\$160,737	
- Non-All Electric	22	210	\$63.27	\$2,652	568	119,280	\$0.04352	\$5,191	\$1,357	\$0	\$1,357	\$6,600	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	61	299	\$449.18	\$27,400	875	261,825	\$0.04350	\$11,381	\$0,539	\$0	\$0,539	\$47,320	
- Mobile Home													
Mobile Home New Construction	68	552	\$52.84	\$48,650	861	475,272	\$0.04351	\$20,679	\$9,816	\$0	\$9,816	\$76,145	
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	425	2,775	\$393.51	\$162,993	435	1,207,725	\$0.04345	\$52,450	\$21,152	\$0	\$21,152	\$236,595	
High-Efficiency Heat Pump	28	7	\$305.36	\$8,550	1,079	13,153	\$0.04349	\$72	\$13,387	\$0	\$13,387	\$22,509	
- Resistance Heat Replacement	51	16	\$442.62	\$27,000	301	4,816	\$0.04353	\$210	\$0	\$1,350	\$1,350	\$28,560	
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Energy Education for Student Program (NEED)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Community Outreach Program (CFL)	926	149	\$5.84	\$5,404	92	13,708	\$0.04370	\$599	\$4,621	\$0	\$4,621	\$10,624	
TOTAL RESIDENTIAL PROGRAMS	1,730	4,593		\$416,347	2,679,179			\$116,471	\$68,061	\$1,350	\$69,411	\$602,229	
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0	\$0	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	1,730	4,593		\$416,347	2,679,179			\$116,471	\$68,061	\$1,350	\$69,411	\$602,229	

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 07/01/2006.
 *** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2009	KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVENUE (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/HALF) (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* REVENUES (8) (6)X(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10) (9)X(.5%)	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)-(9)+(11)
	RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Targeted Energy Efficiency	140	620	\$993.48	\$139,087	1,016	629,920	\$0.04346	\$27,376	\$10,811	\$0	\$10,811	\$177,274
	- All Electric	61	200	\$101.34	\$6,182	568	113,600	\$0.04352	\$4,944	\$3,762	\$0	\$3,762	\$14,868
	- Non-All Electric	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	High - Efficiency Heat Pump	99	342	\$449.48	\$44,500	874	298,808	\$0.04350	\$13,002	\$13,659	\$0	\$13,659	\$71,361
	- Mobile Home	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Mobile Home New Construction	103	556	\$544.17	\$55,950	860	478,160	\$0.04351	\$20,805	\$11,490	\$0	\$11,490	\$88,345
	- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Modified Energy Fitness	375	2,831	\$372.89	\$139,871	435	1,144,465	\$0.04345	\$49,728	\$18,664	\$0	\$18,664	\$208,263
	High Efficiency Heat Pump	63	60	\$514.29	\$32,400	1,879	112,740	\$0.04349	\$4,903	\$30,120	\$0	\$30,120	\$67,423
	- Resistance Heat Replacement	156	144	\$457.92	\$70,500	300	45,200	\$0.04353	\$1,800	\$0	\$3,525	\$3,525	\$75,905
	- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Energy Education for Student Program (NEED)	1,130	558	\$8.00	\$9,045	92	51,336	\$0.04370	\$2,243	\$5,627	\$0	\$5,627	\$16,915
	Community Outreach Program (CFL)	2,878	2,501	\$10.19	\$28,715	92	230,092	\$0.04370	\$10,055	\$14,052	\$0	\$14,052	\$62,832
	TOTAL RESIDENTIAL PROGRAMS	4,945	7,612	\$226.350	\$526,350	3,102,441	3,102,441	\$0.04370	\$134,936	\$108,395	\$3,525	\$111,920	\$773,206
	COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	TOTAL COMMERCIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	TOTAL INDUSTRIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	TOTAL COMPANY	4,945	7,612	\$226.350	\$526,350	3,102,441	3,102,441	\$0.04370	\$134,936	\$108,395	\$3,525	\$111,920	\$773,206

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 07/07/2009.
 *** Cumulative participants include a reduction for the cumulative participants as of 07/07/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2010	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/ACTS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH) QTR (6) (2X(5))	NET LOST REVENUE (KWH) (7) (6)X(7)	TOTAL NET* LOSS REVENUES (8) (6)X(7)	EFFICIENCY INCENTIVE (EX. C. Pg.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(5)	INCENTIVE TOTAL* (11) (9)+(10)	RECOVERED COSTS TO BE (12) (4)+(10)+(11)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 15 (1st HALF)												
PROGRAM DESCRIPTIONS												
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	174	720	\$1,161.51	\$202,103	1,016	731,520	\$0.04346	\$31,792	\$13,436	\$0	\$13,436	\$247,331
- Non-All Electric	31	237	\$114.10	\$3,537	968	134,616	\$0.04352	\$5,858	\$1,912	\$0	\$1,912	\$11,307
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	97	416	\$422.16	\$40,950	875	364,000	\$0.04350	\$15,834	\$13,579	\$0	\$13,579	\$70,363
- Mobile Home												
Mobile Home New Construction												
- Heat Pump	115	621	\$527.63	\$60,700	861	\$34,681	\$0.04351	\$23,264	\$4,462	\$0	\$4,462	\$88,426
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	501	2,762	\$392.89	\$196,836	435	1,201,470	\$0.04345	\$52,204	\$24,935	\$0	\$24,935	\$273,975
High Efficiency Heat Pump												
- Resistance Heat Replacement	97	135	\$450.00	\$43,650	1,878	253,665	\$0.04349	\$11,032	\$46,376	\$0	\$46,376	\$101,058
- Heat Pump Replacement	272	348	\$416.73	\$113,350	301	104,748	\$0.04353	\$4,560	\$0	\$5,668	\$5,668	\$123,578
Energy Education for Student Program (NEED)	488	1,299	\$50.99	\$24,681	73	94,827	\$0.04327	\$4,103	\$2,430	\$0	\$2,430	\$31,414
Community Outreach Program (CFL)	2,644	4,402	\$16.10	\$42,584	91	407,862	\$0.04376	\$17,048	\$13,194	\$0	\$13,194	\$73,606
TOTAL RESIDENTIAL PROGRAMS	4,419	11,020		\$728,571		3,927,369		\$165,495	\$120,324	\$5,668	\$125,992	\$1,021,058
COMMERCIAL PROGRAMS												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0
INDUSTRIAL PROGRAMS - (West, Opt-Outs Removed)												
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0	0	0		\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	4,419	11,020		\$728,571		3,927,369		\$165,495	\$120,324	\$5,668	\$125,992	\$1,021,058

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2007.
 *** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2010	KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ QTRS (6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET* LOST REVENUES (8) (6)(7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(5)	TOTAL* INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(10)+(11)
	YEAR 15 (2nd HALF)												
	PROGRAM DESCRIPTIONS												
	RESIDENTIAL PROGRAMS												
	Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Targeted Energy Efficiency												
	- All Electric	172	787	\$809.62	\$139,254	1,016	789,592	\$0.05745	\$45,945	\$13,282	\$0	\$13,282	\$198,481
	- Non-All Electric	23	242	\$102.35	\$2,354	568	137,456	\$0.05745	\$7,898	\$1,419	\$0	\$1,419	\$11,671
	Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	High - Efficiency Heat Pump	136	496	\$469.49	\$63,850	875	434,000	\$0.05750	\$24,955	\$19,039	\$0	\$19,039	\$107,844
	Mobile Home New Construction												
	- Heat Pump	119	617	\$558.82	\$66,500	861	531,237	\$0.05745	\$30,520	\$13,274	\$0	\$13,274	\$110,294
	- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	Modified Energy Fitness	699	2,939	\$317.39	\$221,657	435	1,278,465	\$0.05752	\$73,537	\$34,789	\$0	\$34,789	\$330,183
	High Efficiency Heat Pump												
	- Resistance Heat Replacement	155	264	\$326.00	\$50,530	1,879	496,056	\$0.05748	\$28,513	\$74,106	\$0	\$74,106	\$153,149
	- Heat Pump Replacement	237	621	\$355.79	\$132,670	301	186,921	\$0.05750	\$10,748	\$0	\$6,634	\$6,634	\$150,062
	Energy Education for Student Program (NEED)	1,059	1,220	\$5.55	\$5,880	74	90,280	\$0.05714	\$5,159	\$5,274	\$0	\$5,274	\$16,319
	Community Outreach Program (CFL)	2,167	3,516	\$6.72	\$14,570	91	319,956	\$0.05768	\$18,455	\$10,813	\$0	\$10,813	\$43,938
	Residential Efficient Products												
	- Compact Fluorescent Lamp (CFL)	0	0	\$0.00	\$0	0	0	\$0.05818	\$0	\$0	\$0	\$0	\$0
	- Specialty Bulbs	0	0	\$0.00	\$0	0	0	\$0.05793	\$0	\$0	\$0	\$0	\$0
	- LED Lights	0	0	\$0.00	\$0	0	0	\$0.05954	\$0	\$0	\$0	\$0	\$0
	HVAC Diagnostic & Tune-Up												
	- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.05749	\$0	\$0	\$0	\$0	\$0
	- Heat Pump	26	3	\$101.79	\$2,850	371	1,113	\$0.05749	\$64	\$319	\$0	\$319	\$3,233
	Residential Load Management (Pilot Program)												
	- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
	TOTAL RESIDENTIAL PROGRAMS	4,795	10,705		\$700,315		4,275,076		\$245,794	\$172,315	\$6,634	\$178,949	\$1,125,065

Year 2010		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ACTUAL PROGRAM COSTS		TOTAL ACTUAL PROGRAM COSTS		NET LOST REV/QTRS		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET * REVENUES LOST		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * INCENTIVE		TOTAL ACTUAL COSTS TO BE RECOVERED		
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	PROGRAM COSTS (4)	REV/QTRS (5)	KWH/ PARTICIPANT QTRs (6)	(KWH/ QTR) (7)	REVENUES LOST (8)	EX. C. PG.2(C) (9)	(5% of COSTS) (10)	INCENTIVE (11)	(EX. C. PG.2(C) (9) X (10)) (12)	REVENUES LOST (8)	TOTAL ENERGY SAVINGS (6) X (7)	NET LOST REVENUE (7) - (8)	TOTAL NET * REVENUES LOST (8) - (9)	EFFICIENCY INCENTIVE (9) X (10)	MAXIMIZING INCENTIVE (10) X (11)	TOTAL * INCENTIVE (11) + (12)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) - (13)						
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																										
YEAR 15 (2nd HALF)																										
COMMERCIAL PROGRAMS																										
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0		0	0	\$0														
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0		0	0	\$0														
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0		0	0	\$0.00000														
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0		0	0	\$0.00000														
Commercial A/C & Heat Pump Program																										
- Air Conditioner Replacement	0	0	\$0.00	\$0	0	0	\$0.14803	\$0		0	0	\$0.14803														
- Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.66599	\$0		0	0	\$0.66599														
HVAC Diagnostic & Tune-Up																										
- Heat Pump	1	0	\$0.00	\$125	819	0	\$0.06476	\$0		0	0	\$0.06476														
Commercial Load Management (Pilot Program)																										
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0		0	0	\$0.00000														
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0		0	0	\$0.00000														
Commercial Incentive	0	0	\$0.00	\$0	0	0	\$0.29657	\$0		0	0	\$0.29657														
TOTAL COMMERCIAL PROGRAMS	1	0		\$125				\$0				\$0														
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)																										
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0		0	0	n/a														
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0		0	0	n/a														
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0		0	0	\$0.00000														
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0		0	0	\$0.00000														
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0				\$0				\$0														
TOTAL COMPANY	4,796	10,705		\$700,440		4,275,076		\$245,794				\$172,345														
* Lost revenue and efficiency incentives are based on prospective values.																										
** Cumulative participants include a reduction for the cumulative participants as of 04/01/2007.																										
*** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFI)).																										

Year 2011		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		TOTAL ACTUAL PROGRAM COSTS		TOTAL ACTUAL PROGRAM COSTS		NET REVENUE		TOTAL NET * REVENUES		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	AVERAGE ACTUAL PROGRAM COSTS (4)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOSS REV/QTRS (5)	TOTAL ENERGY SAVINGS (KWH/ QTR) (6)	NET LOSS REVENUE (KWH/ QTR) (7)	EX. C. Pg.21C INCENTIVE (8)	EFFICIENCY INCENTIVE (9)	MAXIMIZING INCENTIVE (10)	TOTAL * COSTS TO BE RECOVERED (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12)						
RESIDENTIAL PROGRAMS			(4)/(1)				(2)/(6)	(7)			(5 of COSTS) (10)	(9)+(10)	(4)+(9)+(11)						
Energy Fitness	0	0	\$0.00	\$0.00	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
Targeted Energy Efficiency																			
- All Electric	110	814	\$82.04	\$76,124	\$76,124	1,050	85,700	\$0.05746	\$49,111	\$16,253	\$0	\$16,253	\$141,488						
- Non-All Electric	6	208	\$140.17	\$841	\$841	448	93,184	\$0.05746	\$5,354	\$0	\$42	\$42	\$6,237						
Compact Fluorescent Bulb	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
High - Efficiency Heat Pump	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
- Resistance Heat	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
- Non Resistance Heat	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
High - Efficiency Heat Pump	94	442	\$602.11	\$47,198	\$47,198	1,403	620,126	\$0.05750	\$35,657	\$27,615	\$0	\$27,615	\$110,470						
Mobile Home New Construction																			
- Heat Pump	68	624	\$880.15	\$46,250	\$46,250	731	456,144	\$0.05745	\$26,205	\$6,393	\$0	\$6,393	\$78,848						
- Air Conditioner	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
Modified Energy Fitness	645	3,039	\$346.52	\$223,503	\$223,503	283	860,037	\$0.05752	\$49,469	\$9,456	\$0	\$9,456	\$282,428						
High Efficiency Heat Pump																			
- Resistance Heat Replacement	154	328	\$452.59	\$69,699	\$69,699	728	238,784	\$0.05748	\$13,725	\$12,030	\$0	\$12,030	\$95,454						
- Heat Pump Replacement	212	608	\$429.25	\$91,000	\$91,000	923	561,184	\$0.05750	\$32,268	\$25,033	\$0	\$25,033	\$148,301						
Energy Education for Student Program (NEED)	938	2,034	\$12.40	\$11,635	\$11,635	48	97,632	\$0.05714	\$5,579	\$1,613	\$0	\$1,613	\$18,827						
Community Outreach Program (CFL)	2,518	5,442	\$19.93	\$80,179	\$80,179	50	272,100	\$0.05768	\$15,695	\$9,871	\$0	\$9,871	\$75,745						
Residential Efficient Products																			
- Compact Fluorescent Lamp (CFL)	77,764	20,801	\$1.62	\$141,810	\$141,810	17	353,617	\$0.05818	\$20,573	\$24,107	\$0	\$24,107	\$186,480						
- Specialty Bulbs	0	0	\$0.00	\$0	\$0	15	0	\$0.05793	\$0	\$0	\$0	\$0	\$0						
- LED Lights	0	0	\$0.00	\$259	\$259	21	0	\$0.05854	\$0	\$0	\$0	\$0	\$259						
HVAC Diagnostic & Tune-Up																			
- Air Conditioner	64	19	\$50.00	\$3,200	\$3,200	155	2,945	\$0.05749	\$169	\$84	\$0	\$84	\$5,453						
- Heat Pump	290	148	\$72.24	\$20,950	\$20,950	371	54,908	\$0.05749	\$3,157	\$3,300	\$0	\$3,300	\$27,407						
Residential Load Management (Pilot Program)																			
- Air Conditioner	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
- Water Heating	0	0	\$0.00	\$0	\$0	0	0	\$0.00000		\$0	\$0	\$0	\$0						
TOTAL RESIDENTIAL PROGRAMS	82,863	34,607		\$742,656	\$742,656		4,465,361		\$256,962	\$135,765	\$42	\$135,797	\$1,175,415						

KENTUCKY POWER COMPANY
 ESTIMATED SECTOR SURCHARGES FOR 3
 YEAR PROGRAM

YEAR 16 (1st HALF)

EXHIBIT C
 PAGE
 17A-1 of 22

Year 2011		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ACTUAL PROGRAM COSTS		TOTAL ACTUAL PROGRAM COSTS		NET LOST		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET * REVENUES LOST		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * INCENTIVE		TOTAL ACTUAL COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	NUMBER (3)	PER PARTICIPANT (4) / (1)	PROGRAM COSTS (5)	REVENUES (6)	REVENUES (7)	REVENUES (8)	REVENUES (9)	REVENUES (10)	REVENUES (11)	REVENUES (12)	REVENUES (13)	REVENUES (14)	REVENUES (15)	REVENUES (16)	REVENUES (17)	REVENUES (18)	REVENUES (19)	REVENUES (20)	REVENUES (21)	REVENUES (22)	REVENUES (23)	REVENUES (24)	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																									
YEAR 18 (1st HALF)																									
COMMERCIAL PROGRAMS																									
Smart Audit - Class 1	0	0	0	\$0.00	\$0	0	n/a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Class 2	0	0	0	\$0.00	\$0	0	n/a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - Existing Building	0	0	0	\$0.00	\$0	0	\$0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - New Building	0	0	0	\$0.00	\$0	0	\$0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial A/C & Heat Pump Program																									
- Air Conditioner Replacement	1	0	0	\$300.00	\$300	140	\$0.06482	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Heat Pump Replacement	15	4	4	\$236.67	\$3,850	558	\$0.06482	2,232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HVAC Diagnostic & Tune-Up																									
- Air Conditioner	1	0	0	\$0.00	\$0	343	\$0.06476	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Heat Pump	18	8	8	\$72.22	\$1,300	818	\$0.06476	6,544	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial Load Management (Pilot Program)																									
- Air Conditioner	0	0	0	\$0.00	\$0	0	\$0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Water Heating	0	0	0	\$0.00	\$0	0	\$0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial Incentive	0	0	0	\$0.00	\$0	0	\$0.06603	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL COMMERCIAL PROGRAMS	35	12	12		\$5,450	8,776																			
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)																									
Smart Audit - Class 1	0	0	0	\$0.00	\$0	0	n/a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Audit - Class 2	0	0	0	\$0.00	\$0	0	n/a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - General	0	0	0	\$0.00	\$0	0	\$0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Financing - Compressed Air System	0	0	0	\$0.00	\$0	0	\$0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL PROGRAMS	0	0	0		\$0	0																			
TOTAL COMPANY	82,898	34,519	34,519		\$768,106	4,474,137																			
* Lost revenue and efficiency incentives are based on prospective values.																									
** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFD)).																									

Year 2011												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 16 (2nd HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOSS REV/QTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ QTRS (6)	NET LOSS REVENUE (S/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10)	TOTAL * INCENTIVE (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)
RESIDENTIAL PROGRAMS												
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency												
- All Electric	141	769	\$1,428.37	\$201,400	526	404,494	\$0.05749	\$23,254	\$20,833	\$0	\$20,833	\$245,487
- Non-All Electric	23	185	\$114.30	\$2,629	224	43,680	\$0.05746	\$2,510	\$0	\$131	\$131	\$5,270
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	114	552	\$417.85	\$47,635	702	387,504	\$0.05750	\$22,281	\$33,491	\$0	\$33,491	\$103,407
- Mobile Home												
Mobile Home New Construction												
- Heat Pump	92	603	\$600.38	\$46,035	365	220,095	\$0.05749	\$12,653	\$8,649	\$0	\$8,649	\$67,337
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	556	3,354	\$397.49	\$221,004	142	476,268	\$0.05757	\$27,419	\$8,151	\$0	\$8,151	\$256,574
High Efficiency Heat Pump												
- Resistance Heat Replacement	121	483	\$480.50	\$58,140	365	176,295	\$0.05745	\$10,128	\$9,453	\$0	\$9,453	\$77,721
- Heat Pump Replacement	194	678	\$466.22	\$90,446	461	312,558	\$0.05750	\$17,972	\$22,908	\$0	\$22,908	\$131,326
Energy Education for Student Program (NEED)	958	3,383	\$12.90	\$12,361	24	81,192	\$0.05750	\$4,659	\$1,648	\$0	\$1,648	\$16,578
Community Outreach Program (CFL)	2,397	3,845	\$3.89	\$9,335	26	99,970	\$0.05765	\$5,763	\$9,396	\$0	\$9,396	\$24,494
Residential Efficient Products												
- Compact Fluorescent Lamp (CFL)	55,928	28,215	\$3.06	\$170,927	8	225,720	\$0.05818	\$13,132	\$17,338	\$0	\$17,338	\$201,397
- Specialty Bulbs	0	0	\$0.00	\$66	7	0	\$0.05793	\$0	\$0	\$0	\$0	\$26
- LED Lights	0	0	\$0.00	\$1,125	10	0	\$0.05854	\$0	\$0	\$0	\$0	\$1,125
HVAC Diagnostic & Tune-Up												
- Air Conditioner	168	101	\$142.19	\$23,888	78	7,878	\$0.05749	\$453	\$220	\$0	\$220	\$24,561
- Heat Pump	440	178	\$118.61	\$52,198	185	32,830	\$0.05749	\$1,893	\$5,007	\$0	\$5,007	\$59,088
Residential Load Management (Pilot Program)												
- Air Conditioner	6	1	\$8,624.83	\$51,749	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$51,749
- Water Heating	4	1	\$12,937.25	\$51,749	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$51,749
TOTAL RESIDENTIAL PROGRAMS	61,142	42,358		\$1,040,637		2,468,584		\$142,127	\$137,094	\$131	\$137,225	\$1,319,969

Year 2011		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ACTUAL PROGRAM COSTS		TOTAL ACTUAL PROGRAM COSTS		NET LOST REVENUE		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET* REVENUES		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL* INCENTIVE		TOTAL ESTIMATED COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	NUMBER (2)	PER PARTICIPANT COSTS (3)	TOTAL PROGRAM COSTS (4)	REV/QTRS (5)	(KWH/ PARTICIPANT) QTRS (2)(X5)	TOTAL KWH/ QTRS (6)	NET LOST REVENUE (\$/KWH) (7)	REVENUES (8)	INCENTIVE (EX. C. PG.21C) (9)	(5% of COSTS) (10)	INCENTIVE (9)(10)	RECOVERED (12)											
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																									
YEAR 16 (2nd HALF)																									
COMMERCIAL PROGRAMS																									
Smart Audit - Class 1	0	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program																									
- Air Conditioner Replacement	2	1	1	\$4,053.00	\$8,106	71	71	71	\$0.07447	\$5	\$2	\$2	\$2	\$8,113	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2
- Heat Pump Replacement	6	2	2	\$1,876.33	\$11,258	279	279	279	\$0.07430	\$41	\$349	\$0	\$349	\$11,648	\$0	\$349	\$0	\$349	\$0	\$349	\$0	\$349	\$0	\$349	\$0
HVAC Diagnostic & Tune-Up																									
- Air Conditioner	45	30	30	\$223.56	\$10,060	172	172	172	\$0.07424	\$383	\$326	\$0	\$326	\$10,769	\$0	\$326	\$0	\$326	\$0	\$326	\$0	\$326	\$0	\$326	\$0
- Heat Pump	88	47	47	\$176.81	\$15,735	410	410	410	\$0.07429	\$1,432	\$2,601	\$0	\$2,601	\$19,768	\$0	\$2,601	\$0	\$2,601	\$0	\$2,601	\$0	\$2,601	\$0	\$2,601	\$0
Commercial Load Management (Pilot Program)																									
- Air Conditioner	0	0	0	\$0.00	\$7,157	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$7,157	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,157
- Water Heating	0	0	0	\$0.00	\$7,157	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$7,157	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,157
Commercial Incentive	18	2	2	\$14,017.44	\$252,314	3,739	3,739	3,739	\$0.07612	\$662	\$42,852	\$0	\$42,852	\$295,729	\$0	\$42,852	\$0	\$42,852	\$0	\$42,852	\$0	\$42,852	\$0	\$42,852	\$0
TOTAL COMMERCIAL PROGRAMS	159	82	82		\$311,787			32,537		\$2,423	\$46,130	\$0	\$46,130	\$360,340	\$0	\$46,130	\$0	\$46,130	\$0	\$46,130	\$0	\$46,130	\$0	\$46,130	\$0
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)																									
Smart Audit - Class 1	0	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0	0		\$0			0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	61,301	42,440	42,440		\$1,352,424		2,501,121			\$144,550	\$183,224	\$131	\$183,355	\$1,680,329	\$131	\$183,355	\$131	\$183,355	\$131	\$183,355	\$131	\$183,355	\$131	\$183,355	\$1,680,329

* Lost revenue and efficiency incentives are based on prospective values.

** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2012													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 17 (1st HALF)													18A-1 of
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/ QTRS (6) (2X)(5)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8) (6X)(7)	EFFICIENCY INCENTIVE (EX. C. PG. 21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)X(9)	TOTAL * INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)	
RESIDENTIAL PROGRAMS													
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Targeted Energy Efficiency													
- All Electric	142	654	\$1,210.67	\$171,958	981	837,774	\$0.05749	\$48,164	\$15,221	\$0	\$15,221	\$235,343	
- Non-All Electric	16	165	\$82.06	\$1,313	437	72,105	\$0.05746	\$4,143	\$0	\$66	\$66	\$5,522	
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
High - Efficiency Heat Pump													
- Mobile Home	110	439	\$478.64	\$52,650	1,281	566,749	\$0.05750	\$32,588	\$26,043	\$0	\$26,043	\$111,281	
Mobile Home New Construction													
- Heat Pump	79	575	\$550.00	\$43,450	841	483,575	\$0.05749	\$27,801	\$6,554	\$0	\$6,554	\$77,805	
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	
Modified Energy Fitness	646	3,301	\$322.61	\$208,408	325	1,072,825	\$0.05757	\$81,763	\$4,115	\$0	\$4,115	\$274,285	
High Efficiency Heat Pump													
- Resistance Heat Replacement	88	208	\$455.11	\$40,050	671	139,668	\$0.05745	\$9,018	\$3,458	\$0	\$3,458	\$51,526	
- Non Resistance Heat Pump Replacement	217	378	\$465.99	\$101,250	849	320,922	\$0.05750	\$18,453	\$19,218	\$0	\$19,218	\$138,921	
Energy Education for Student Program (NEED)	525	2,677	\$17.61	\$9,245	111	297,147	\$0.05750	\$17,086	\$1,664	\$0	\$1,664	\$27,995	
Community Outreach Program (CFL)	2,335	5,934	\$9.68	\$22,614	124	735,816	\$0.05765	\$42,420	\$11,138	\$0	\$11,138	\$76,172	
Residential Efficient Products													
- Compact Fluorescent Lamp (CFL)	51,481	32,225	\$3.27	\$168,572	23	741,175	\$0.05818	\$43,122	\$43,759	\$0	\$43,759	\$255,453	
- Specialty CFL's	0	0	\$0.00	\$19	15	0	\$0.05793	\$0	\$1	\$0	\$1	\$20	
- LED Lights	0	0	\$0.00	\$584	21	0	\$0.05854	\$0	\$0	\$29	\$29	\$613	
HVAC Diagnostic & Tune-Up													
- Air Conditioner	147	69	\$121.90	\$17,919	62	4,278	\$0.05749	\$246	\$0	\$896	\$896	\$19,061	
- Heat Pump	324	255	\$109.32	\$35,419	234	59,670	\$0.05749	\$3,430	\$0	\$1,771	\$1,771	\$40,920	
Residential Load Management (Pilot Program)													
- Air Conditioner	36	17	\$1,441.56	\$51,897	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$51,897	
- Water Heating	32	15	\$1,621.76	\$51,897	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$51,897	
TOTAL RESIDENTIAL PROGRAMS	56,178	47,112		\$977,245		5,331,604		\$307,234	\$131,170	\$2,763	\$133,933	\$1,418,412	

Year 2012												Exhibit C PAGE 18A-2 of 22	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													
YEAR 17 (1st HALF)													
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS (3)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REV/QTRS (5)	TOTAL ENERGY SAVINGS KWH/ QTRs (6)	NET LOST REVENUE (S/KWH) (7)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (8)	MAXIMIZING INCENTIVE (5% of COSTS) (9)	INCENTIVE TOTAL* (10)	TOTAL ESTIMATED COSTS TO BE RECOVERED (11)		
			PER PARTICIPANT (3)		REV/QTRS (5)				(4)X(9)	(9)X(10)	(9)X(11)		
COMMERCIAL PROGRAMS													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0		
- Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0		
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		
Commercial A/C & Heat Pump Program													
- Air Conditioner Replacement	1	0	\$6,342.00	\$6,342	121	0	\$0.07447	\$0	\$0	\$317	\$6,659		
- Heat Pump Replacement	10	2	\$1,044.10	\$10,441	570	1,140	\$0.07430	\$85	\$0	\$622	\$11,040		
HVAC Diagnostic & Tune-Up													
- Air Conditioner	24	11	\$310.46	\$7,451	115	1,265	\$0.07424	\$94	\$0	\$373	\$7,919		
- Heat Pump	56	22	\$222.34	\$12,451	349	7,678	\$0.07429	\$570	\$0	\$623	\$13,644		
Commercial Load Management (Pilot Program)													
- Air Conditioner	0	0	\$0.00	\$7,630	0	0	\$0.00000	\$0	\$0	\$0	\$7,630		
- Water Heating	0	0	\$0.00	\$7,631	0	0	\$0.00000	\$0	\$0	\$0	\$7,631		
Commercial Incentive	24	6	\$13,772.13	\$330,531	8,788	52,728	\$0.07512	\$3,961	\$0	\$16,527	\$351,019		
TOTAL COMMERCIAL PROGRAMS	115	41		\$382,477		62,811		\$4,710	\$0	\$18,362	\$405,549		
INDUSTRIAL PROGRAMS - (w/Est. Opt/Outs Removed)													
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0		
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0		
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0		
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0		
TOTAL COMPANY	56,293	47,153		\$1,369,722		5,394,415		\$311,944	\$131,170	\$21,125	\$1,823,961		
* Lost revenue and efficiency incentives are based on prospective values.													
** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).													

Year 2012													Exhibit C
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM													PAGE
YEAR 17 (END HALF)													18B-1 of
PROGRAM DESCRIPTIONS													22
NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOSS REV/DTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/DTRS (6) (2)X(5)	NET LOSS REVENUE (KWH) (7) (6)X(7)	TOTAL NET * REVENUES (8) (6)X(7)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (9)X(5%)	TOTAL * INCENTIVE (11) (9)+(10)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(10)+(11)		
RESIDENTIAL PROGRAMS	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	
Energy Fitness													
Targeted Energy Efficiency													
- All Electric	43	\$2,094.67	\$90,028	981	617,049	\$0.05749	\$35,474	\$4,609	\$0	\$4,609	\$130,111		
- Non-All Electric	4	\$345.25	\$1,361	436	42,292	\$0.05746	\$2,430	\$0	\$68	\$68	\$3,959		
Compact Fluorescent Bulb	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
- Resistance Heat	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
- Non Resistance Heat	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
High - Efficiency Heat Pump	112	\$445.98	\$49,950	1,282	760,988	\$0.05747	\$43,734	\$26,516	\$0	\$26,516	\$120,200		
- Mobile Home													
Mobile Home New Construction													
- Heat Pump	76	\$555.29	\$42,050	840	486,800	\$0.05747	\$25,103	\$6,305	\$0	\$6,305	\$73,458		
- Air Conditioner	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Modified Energy Fitness	554	\$404.00	\$223,816	326	1,016,794	\$0.05751	\$58,475	\$3,929	\$0	\$3,929	\$285,021		
High Efficiency Heat Pump													
- Resistance Heat Replacement	73	\$431.51	\$31,500	671	325,435	\$0.05750	\$18,713	\$2,869	\$0	\$2,869	\$53,082		
- Non Resistance Heat Pump Replacement	209	\$439.23	\$91,800	849	580,904	\$0.05746	\$33,953	\$18,509	\$0	\$18,509	\$144,262		
Energy Education for Student Program (NEED)	1,562	\$12.15	\$18,983	111	355,311	\$0.05730	\$20,359	\$4,952	\$0	\$4,952	\$44,294		
Community Outreach Program (CFL)	3,306	\$9.93	\$32,817	124	675,428	\$0.05758	\$38,891	\$15,770	\$0	\$15,770	\$87,478		
Residential Efficient Products													
- Compact Fluorescent Lamp (CFL)	84,738	\$2.19	\$185,235	22	795,212	\$0.05739	\$45,637	\$72,027	\$0	\$72,027	\$302,899		
- Specialty CFL's	0	\$0.00	\$18	14	0	\$0.05793	\$0	\$0	\$0	\$0	\$18		
- LED Lights	12	\$48.25	\$579	20	140	\$0.05654	\$8	\$0	\$29	\$29	\$616		
HVAC Diagnostic & Tune-Up													
- Air Conditioner	75	\$172.67	\$12,950	63	7,245	\$0.05714	\$414	\$0	\$646	\$646	\$14,012		
- Heat Pump	458	\$102.95	\$47,150	233	129,315	\$0.05744	\$7,428	\$0	\$2,396	\$2,396	\$56,996		
Residential Load Management (Pilot Program)													
- Air Conditioner	23	\$2,450.09	\$56,352	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$56,352		
- Water Heating	16	\$3,390.50	\$54,248	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$54,248		
TOTAL RESIDENTIAL PROGRAMS	91,261		\$936,837		\$7,792,913		\$330,620	\$155,086	\$3,103	\$158,189	\$1,427,646		

Year 2012		NEW PARTICIPANT		CUMULATIVE PARTICIPANT	AVERAGE ACTUAL PROGRAM COSTS	TOTAL ACTUAL PROGRAM COSTS	NET LOST REV/QTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * REVENUES	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL * INCENTIVE	TOTAL ESTIMATED COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	TOTAL PROGRAM COSTS (4)	REV/QTRS (KWH/PARTICIPANT) (5)	NET LOST (KWH) (6)	ENERGY SAVINGS (KWH) (7)	REVENUE (S/KWH) (8)	REVENUES (6)(7) (9)	EX. C. PG. 21C (9) (10)	(5% OF COSTS) (10) (11)	TOTAL * INCENTIVE (11) (12)	RECOVERED (12) (13)	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 17 (20d HALF)														
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program	0	0	\$0.00	\$5,264	121	0	0	\$0.07419	\$0	\$0	\$263	\$263	\$5,527	\$10,066
- Heat Pump Replacement	10	6	\$936.40	\$9,364	570	3,420	3,420	\$0.07438	\$254	\$0	\$468	\$468	\$0	\$0
HVAC Diagnostic & Tune-Up	14	6	\$367.86	\$5,150	114	684	684	\$0.07461	\$51	\$0	\$258	\$258	\$5,459	\$6,242
- Air Conditioner	44	17	\$125.57	\$5,525	349	5,933	5,933	\$0.07438	\$441	\$0	\$276	\$276	\$0	\$0
Commercial Load Management (Pilot Program)	0	0	\$0.00	\$8,551	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$8,551	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$8,551	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Commercial Incentive	104	26	\$7,324.43	\$761,741	8,788	228,488	228,488	\$0.07235	\$16,531	\$0	\$38,087	\$38,087	\$816,359	\$860,775
TOTAL COMMERCIAL PROGRAMS	172	55		\$804,146		238,525			\$17,277	\$0	\$39,352	\$39,352	\$860,775	\$917,541
INDUSTRIAL PROGRAMS - (W/EST. OPT-OUTS REMOVED)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0			\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	91,433	51,669		\$1,742,963		5,991,438			\$347,997	\$155,086	\$42,455	\$197,541	\$2,268,421	\$2,268,421

* Lost revenue and efficiency incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).

Year 2013														Exhibit C
KENTUCKY POWER COMPANY ACTUAL SECTOR SURCHARGES FOR 3 YEAR PROGRAM														PAGE
														19A-1 of
														22
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ACTUAL PROGRAM COSTS PER PARTICIPANT (3) (4)/(1)	TOTAL ACTUAL PROGRAM COSTS (4)	NET LOST REVENUES (KWH/ PARTICIPANT) (5)	TOTAL ENERGY SAVINGS (KWH/ QTRS (6) (2X)(6)	NET LOST REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8) (6)(X)(7)	EFFICIENCY INCENTIVE (EX. C, PG.21C) (9)	MAXIMIZING INCENTIVE (5% of COSTS) (10) (4)(X)(5)	TOTAL * INCENTIVE (9)+(10) (11)	TOTAL ACTUAL COSTS TO BE RECOVERED (12) (4)+(9)+(11)		
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0		
Energy Fitness														
Targeted Energy Efficiency														
- All Electric	48	560	\$1,289.63	\$61,912	981	669,990	\$0.05749	\$32,711	\$5,145	\$5,145	\$69,768			
- Non-All Electric	11	77	\$82.64	\$909	437	33,649	\$0.05746	\$1,933	\$45	\$45	\$2,887			
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
High - Efficiency Heat Pump	96	656	\$411.98	\$39,550	1,292	847,552	\$0.05747	\$48,709	\$22,728	\$22,728	\$110,987			
- Mobile Home														
Mobile Home New Construction														
- Heat Pump	67	526	\$625.37	\$35,200	841	442,366	\$0.05747	\$25,423	\$5,558	\$5,558	\$66,181			
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0			
Modified Energy Fitness	598	3,693	\$336.43	\$201,184	326	1,203,918	\$0.05751	\$69,237	\$3,809	\$3,809	\$274,230			
High Efficiency Heat Pump														
- Resistance Heat Replacement	84	405	\$460.12	\$38,650	671	271,755	\$0.05750	\$15,626	\$3,301	\$3,301	\$57,577			
- Non Resistance Heat Pump Replacement	207	565	\$452.90	\$93,750	849	486,655	\$0.05746	\$28,538	\$18,932	\$18,932	\$140,620			
Energy Education for Student Program (NEED)	569	637	\$12.86	\$7,573	111	70,707	\$0.05730	\$4,052	\$1,857	\$1,857	\$13,492			
Community Outreach Program (CFL)	2,291	6,324	\$15.84	\$36,283	124	784,176	\$0.05768	\$45,153	\$10,928	\$10,928	\$92,364			
Residential Efficient Products														
- Compact Fluorescent Lamp (CFL)	100,849	80,891	\$2.23	\$225,132	23	1,860,493	\$0.05739	\$106,774	\$85,722	\$85,722	\$417,828			
- Specialty CFLs	12,552	6,995	\$2.38	\$29,884	30	191,850	\$0.05793	\$11,114	\$14,560	\$14,560	\$56,568			
- LED Lights	0	0	\$0.00	\$223	0	0	\$0.09954	\$0	\$11	\$11	\$234			
HVAC Diagnostic & Tune-Up														
- Air Conditioner	0	69	\$0.00	\$000	63	4,347	\$0.05714	\$248	\$0	\$10	\$468			
- Heat Pump	69	296	\$183.48	\$12,660	234	69,264	\$0.05744	\$3,979	\$0	\$633	\$17,272			
Residential Load Management (Pilot Program)														
- Air Conditioner	0	0	\$0.00	\$0,668	0	0	\$0.00000	\$0	\$0	\$0	\$8,650			
- Water Heating	0	0	\$0.00	\$9,628	0	0	\$0.00000	\$0	\$0	\$0	\$9,628			
TOTAL RESIDENTIAL PROGRAMS	117,461	101,134		\$800,406		6,845,722		\$393,497	\$171,950	\$172,649	\$1,366,552			

Year 2013		NEW PARTICIPANT		CUMULATIVE PARTICIPANT	AVERAGE ESTIMATED PROGRAM COSTS	TOTAL ESTIMATED PROGRAM COSTS	NET LOST REV/QTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * LOSS	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL * INCENTIVE	TOTAL ESTIMATED COSTS TO BE RECOVERED
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	REV/QTRS (KWH/PARTICIPANT) (5)	NET LOST REVENUE (KWH) (6)	QTRS (7)	(KWH) (8)	REVENUES (9)	(EX. C. PG. 21C) (10)	(5% of COSTS) (11)	(9)+(10) (12)	(12) (4)+(8)+(11)	
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM														
YEAR 18 (1st HALF)														
COMMERCIAL PROGRAMS														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0
Smart Financing - Existing Building	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0
Smart Financing - New Building	0	0	\$0.00	\$0	0	0	0	0	0	0	0	0	0	0
Commercial A/C & Heat Pump Program	0	1	\$0.00	\$0	121	121	0.07106	\$9	\$9	\$0	\$0	\$0	\$9	
- Air Conditioner Replacement	5	15	\$340.00	\$2,700	570	8,550	\$0.07106	\$608	\$608	\$0	\$135	\$135	\$3,443	
HVAC Diagnostic & Tune-Up	0	12	\$0.00	\$125	115	1,380	\$0.07109	\$88	\$88	\$0	\$5	\$5	\$228	
- Air Conditioner	6	27	\$263.33	\$1,580	349	9,423	\$0.07114	\$670	\$670	\$0	\$79	\$79	\$2,329	
Commercial Incentive	53	31	\$5,851.98	\$310,155	8,788	272,428	\$0.07038	\$19,173	\$19,173	\$0	\$15,508	\$15,508	\$344,836	
Commercial Load Management (Pilot Program)	0	0	\$0.00	\$750	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$750	
- Air Conditioner	0	0	\$0.00	\$750	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$750	
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	64	86		\$316,060		291,902		\$20,958	\$20,958	\$0	\$15,728	\$15,728	\$352,346	
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)														
Smart Audit - Class 1	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Audit - Class 2	0	0	\$0.00	\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Financing - General	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	
Smart Financing - Compressed Air System	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL INDUSTRIAL PROGRAMS	0	0		\$0		0		\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL COMPANY	117,525	101,220		\$1,116,466		7,137,824		\$414,055	\$414,055	\$171,950	\$16,427	\$188,377	\$1,716,898	

* Lost revenue and efficiency incentives are based on prospective values.

** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFE)).

Year 2013		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ESTIMATED PROGRAM COSTS		TOTAL ESTIMATED PROGRAM COSTS		NET LOSS REV/QTRS		TOTAL ENERGY SAVINGS		NET LOSS REVENUE		TOTAL NET * REVENUES		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * INCENTIVE		TOTAL ESTIMATED COSTS TO BE RECOVERED		
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	REV/QTRS (5)	NET LOSS (6)	PER PARTICIPANT (3)	TOTAL ESTIMATED PROGRAM COSTS (4)	REV/QTRS (5)	NET LOSS (6)	REVENUES (7)	TOTAL NET * (8)	EX. C. P.S.(2)(C) (9)	INCENTIVE (EX. C. P.S.(2)(C) (9))	INCENTIVE (10)	TOTAL * (11)	REVENUES (8)	TOTAL NET * (8)	EX. C. P.S.(2)(C) (9)	INCENTIVE (10)	TOTAL * (11)	REVENUES (8)	TOTAL NET * (8)	EX. C. P.S.(2)(C) (9)	INCENTIVE (10)	TOTAL * (11)
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																										
YEAR 18 (2nd HALF)																										
RESIDENTIAL PROGRAMS																										
Energy Fitness	0	0	\$0.00	\$0.00	0	0	\$0.00	\$0.00	0	0	\$0.00000	\$0.00														
Targeted Energy Efficiency																										
- All Electric	65	434	\$1,191.70	\$77,461	981	425,754	\$1,191.70	\$77,461	981	425,754	\$0.05749	\$24,477	\$6,967	\$0	\$0	\$6,967	\$24,477	\$24,477	\$6,967	\$0	\$0	\$6,967	\$24,477	\$24,477	\$6,967	\$108,905
- Non-All Electric	6	73	\$227.63	\$1,366	496	31,828	\$227.63	\$1,366	496	31,828	\$0.05746	\$1,829	\$0	\$0	\$0	\$0	\$1,829	\$1,829	\$0	\$0	\$0	\$0	\$1,829	\$1,829	\$0	\$3,263
Compact Fluorescent Bulb	0	0	\$0.00	\$0.00	0	0	\$0.00	\$0.00	0	0	\$0.00000	\$0.00														
High - Efficiency Heat Pump																										
- Resistance Heat	0	0	\$0.00	\$0.00	0	0	\$0.00	\$0.00	0	0	\$0.00000	\$0.00														
- Non Resistance Heat	0	0	\$0.00	\$0.00	0	0	\$0.00	\$0.00	0	0	\$0.00000	\$0.00														
High - Efficiency Heat Pump																										
- Mobile Home	94	668	\$554.64	\$52,136	1,291	849,478	\$554.64	\$52,136	1,291	849,478	\$0.05747	\$48,620	\$22,255	\$0	\$0	\$22,255	\$48,620	\$48,620	\$22,255	\$0	\$0	\$22,255	\$48,620	\$48,620	\$22,255	\$123,211
Mobile Home New Construction																										
- Heat Pump	58	566	\$688.40	\$39,495	840	467,040	\$688.40	\$39,495	840	467,040	\$0.05747	\$26,841	\$4,895	\$0	\$0	\$4,895	\$26,841	\$26,841	\$4,895	\$0	\$0	\$4,895	\$26,841	\$26,841	\$4,895	\$71,231
- Air Conditioner	0	0	\$0.00	\$0.00	0	0	\$0.00	\$0.00	0	0	\$0.00000	\$0.00														
Modified Energy Fitness	602	3,612	\$440.32	\$265,074	325	1,173,900	\$440.32	\$265,074	325	1,173,900	\$0.05751	\$67,511	\$3,835	\$0	\$0	\$3,835	\$67,511	\$67,511	\$3,835	\$0	\$0	\$3,835	\$67,511	\$67,511	\$3,835	\$356,420
High Efficiency Heat Pump																										
- Resistance Heat Replacement	90	576	\$424.26	\$38,163	671	386,496	\$424.26	\$38,163	671	386,496	\$0.05750	\$22,224	\$3,537	\$0	\$0	\$3,537	\$22,224	\$22,224	\$3,537	\$0	\$0	\$3,537	\$22,224	\$22,224	\$3,537	\$63,944
- Non Resistance Heat Pump Replacement	171	1,040	\$468.92	\$80,186	849	882,960	\$468.92	\$80,186	849	882,960	\$0.05746	\$50,735	\$15,144	\$0	\$0	\$15,144	\$50,735	\$50,735	\$15,144	\$0	\$0	\$15,144	\$50,735	\$50,735	\$15,144	\$146,065
Energy Education for Student Program (NEED)	1,641	3,796	\$13.27	\$21,778	111	421,356	\$13.27	\$21,778	111	421,356	\$0.05730	\$24,144	\$5,202	\$0	\$0	\$5,202	\$24,144	\$24,144	\$5,202	\$0	\$0	\$5,202	\$24,144	\$24,144	\$5,202	\$51,124
Community Outreach Program (CFL)	2,725	4,474	\$7.90	\$21,520	124	554,776	\$7.90	\$21,520	124	554,776	\$0.05758	\$31,944	\$12,998	\$0	\$0	\$12,998	\$31,944	\$31,944	\$12,998	\$0	\$0	\$12,998	\$31,944	\$31,944	\$12,998	\$66,462
Residential Efficient Products																										
- Compact Fluorescent Lamp (CFL)	105,916	89,504	\$1.84	\$194,980	23	2,058,592	\$1.84	\$194,980	23	2,058,592	\$0.05739	\$118,143	\$90,029	\$0	\$0	\$90,029	\$118,143	\$118,143	\$90,029	\$0	\$0	\$90,029	\$118,143	\$118,143	\$90,029	\$403,152
- Specialty CFL's	12,806	9,749	\$2.08	\$26,636	30	172,170	\$2.08	\$26,636	30	172,170	\$0.05793	\$9,991	\$14,878	\$0	\$0	\$14,878	\$9,991	\$9,991	\$14,878	\$0	\$0	\$14,878	\$9,991	\$9,991	\$14,878	\$51,505
- LED Lights	115	40	\$0.00	\$1,269	0	0	\$0.00	\$1,269	0	0	\$0.05854	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
HVAC Diagnostic & Tune-Up																										
- Air Conditioner	0	148	\$0.00	\$0.00	63	9,324	\$0.00	\$0.00	63	9,324	\$0.05714	\$533	\$0	\$0	\$0	\$0	\$533	\$533	\$0	\$0	\$0	\$0	\$533	\$533	\$0	\$533
- Heat Pump	87	389	\$113.78	\$9,899	234	91,026	\$113.78	\$9,899	234	91,026	\$0.05744	\$5,229	\$0	\$0	\$0	\$0	\$5,229	\$5,229	\$0	\$0	\$0	\$0	\$5,229	\$5,229	\$0	\$15,623
Residential Load Management (Pilot Program)																										
- Air Conditioner	0	0	\$0.00	\$1,875	0	0	\$0.00	\$1,875	0	0	\$0.00000	\$0.00														
- Water Heating	0	0	\$0.00	\$1,875	0	0	\$0.00	\$1,875	0	0	\$0.00000	\$0.00														
TOTAL RESIDENTIAL PROGRAMS	124,397	111,049		\$633,732				\$633,732			7,525,000	\$432,421	\$179,740	\$626	\$180,366	\$1,446,519	\$432,421	\$432,421	\$626	\$180,366	\$1,446,519	\$432,421	\$432,421	\$626	\$180,366	\$1,446,519

Year 2013		NEW PARTICIPANT		CUMULATIVE PARTICIPANT	AVERAGE ESTIMATED PROGRAM COSTS	TOTAL ESTIMATED PROGRAM COSTS	NET LOST REV/DTRS	TOTAL ENERGY SAVINGS	NET LOST REVENUE	TOTAL NET * REVENUES LOST	EFFICIENCY INCENTIVE	MAXIMIZING INCENTIVE	TOTAL * INCENTIVE		TOTAL ESTIMATED COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS	NUMBER (1)	NUMBER (2)	PER PARTICIPANT COSTS (3)	NUMBER (4)	TOTAL ESTIMATED PROGRAM COSTS (4)	REV/DTRS (5)	KWH/ PARTICIPANT (6)	(\$/KWH) (7)	REVENUES LOST (8)	(9)X(7)	(EX. C. PG.21C) (9)	(5% of COSTS) (10)	(9)X(10)	(11)	(12)	
			(4)/(1)			(KWH/ PARTICIPANT) (5)	(2)X(6)					(4)X(5%)	(9)X(10)		(4)+(9)+(11)	
KENTUCKY POWER COMPANY																
ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																
YEAR 18 (2nd HALF)																
PROGRAM DESCRIPTIONS																
COMMERCIAL PROGRAMS																
Smart Audit - Class 1	0	0	\$0.00	0	\$0.00	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	0	\$0.00	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program	0	1	\$0.00	1	\$1,950.00	120	120	\$0.07106	\$9	\$9	\$0	\$100	\$100	\$100	\$2,099	
- Air Conditioner Replacement	6	13	\$1,030.44	6	\$6,182.64	570	7,410	\$0.07108	\$627	\$627	\$0	\$309	\$309	\$309	\$7,019	
HVAC Diagnostic & Tune-Up	0	21	\$0.00	0	\$0.00	115	2,415	\$0.07109	\$172	\$172	\$0	\$0	\$0	\$0	\$172	
- Air Conditioner	10	57	\$539.70	10	\$5,397.00	348	19,656	\$0.07114	\$1,411	\$1,411	\$0	\$270	\$270	\$270	\$7,078	
- Heat Pump	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Commercial Incentive	98	79	\$6,512.07	98	\$638,183	8,788	694,252	\$0.07098	\$48,961	\$48,961	\$0	\$31,909	\$31,909	\$31,909	\$718,953	
Commercial Load Management (Pilot Program)	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Air Conditioner	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
- Water Heating	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL COMMERCIAL PROGRAMS	114	171		114	\$661,753		724,033		\$50,980	\$50,980	\$0	\$32,588	\$32,588	\$32,588	\$735,321	
INDUSTRIAL PROGRAMS -																
(w/Est. Opt-Outs Removed)																
Smart Audit - Class 1	0	0	\$0.00	0	\$0.00	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2	0	0	\$0.00	0	\$0.00	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System	0	0	\$0.00	0	\$0.00	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS	0	0		0	\$0.00		0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY	124,511	111,220		124,511	\$1,485,485		8,249,033		\$483,401	\$483,401	\$179,740	\$33,214	\$33,214	\$33,214	\$2,187,840	
* Lost revenue and efficiency incentives are based on prospective values.																
** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFL)).																

Year 2014												
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM												
YEAR 19 (1st HALF)												
PROGRAM DESCRIPTIONS	NEW PARTICIPANT NUMBER (1)	CUMULATIVE PARTICIPANT NUMBER (2)	AVERAGE ESTIMATED PROGRAM COSTS (3) (4)/(1)	TOTAL ESTIMATED PROGRAM COSTS (4)	NET LOSS REV/QTRS (KWH/PARTICIPANT) (5)	TOTAL ENERGY SAVINGS KWH/QTR (6)	NET LOSS REVENUE (\$/KWH) (7)	TOTAL NET * REVENUES (8)	EFFICIENCY INCENTIVE (EX. C. PG.21C) (9)	MAXIMIZING INCENTIVE (5% OF COSTS) (10) (9)*(10)	INCENTIVE TOTAL * (11) (9)+(10)	TOTAL ESTIMATED COSTS TO BE RECOVERED (12) (9)+(10)+(11)
RESIDENTIAL PROGRAMS	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Fitness	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Targeted Energy Efficiency	73	407	\$1,608.41	\$117,414	981	399,267	\$0.05749	\$22,954	\$7,025	\$0	\$7,025	\$146,193
- All Electric	13	64	\$346.54	\$4,427	437	23,998	\$0.05746	\$1,356	\$0	\$221	\$221	\$6,004
Compact Fluorescent Bulb	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Non Resistance Heat	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
High - Efficiency Heat Pump	100	616	\$590.07	\$59,007	1,292	795,872	\$0.05747	\$45,739	\$23,675	\$0	\$23,675	\$128,421
- Mobile Home Retrofit	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Mobile Home New Construction	67	433	\$742.72	\$49,762	841	364,153	\$0.05747	\$20,928	\$5,558	\$0	\$5,558	\$76,248
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Modified Energy Fitness	1,000	3,808	\$432.99	\$432,992	326	1,241,408	\$0.05751	\$71,393	\$6,370	\$0	\$6,370	\$510,755
High Efficiency Heat Pump	84	318	\$540.14	\$45,372	671	213,378	\$0.05750	\$12,269	\$3,301	\$0	\$3,301	\$60,942
- Resistance Heat Replacement	218	925	\$927.61	\$115,018	849	445,725	\$0.05746	\$25,611	\$19,306	\$0	\$19,306	\$159,935
- Non Resistance Heat Pump Replacement	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Energy Education for Student Program (NEED)	700	638	\$26.14	\$18,296	111	70,818	\$0.05730	\$4,058	\$2,219	\$0	\$2,219	\$24,573
Community Outreach Program (CFL)	2,193	6,505	\$15.92	\$34,915	124	806,620	\$0.05758	\$46,445	\$10,461	\$0	\$10,461	\$91,821
Residential Efficient Products	120,000	89,213	\$3.00	\$360,296	23	2,281,899	\$0.05739	\$130,958	\$102,000	\$0	\$102,000	\$593,254
- Compact Fluorescent Lamp (CFL)	10,002	11,158	\$4.92	\$49,174	30	334,740	\$0.05793	\$19,381	\$11,602	\$0	\$11,602	\$60,167
- Specialty CFL's	2,250	1,125	\$0.00	\$26,372	0	0	\$0.05654	\$0	\$1,319	\$1,319	\$1,319	\$27,691
- LED Lights	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
HVAC Diagnostic & Tune-Up	0	96	\$0.00	\$0	63	6,048	\$0.05714	\$346	\$0	\$0	\$0	\$346
- Air Conditioner	120	406	\$159.48	\$19,137	234	95,004	\$0.05744	\$5,457	\$957	\$957	\$957	\$25,551
- Heat Pump	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
Residential Load Management (Pilot Program)	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Air Conditioner	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
- Water Heating	0	0	\$0.00	\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0
TOTAL RESIDENTIAL PROGRAMS	136,820	125,302	\$1,332.182	\$1,332,182	7,076,530	7,076,530	\$406,905	\$192,317	\$2,497	\$2,497	\$194,814	\$1,933,901

Year 2014		NEW PARTICIPANT		CUMULATIVE PARTICIPANT		AVERAGE ESTIMATED PROGRAM COSTS		TOTAL ESTIMATED PROGRAM COSTS		NET LOST REV/DQTRS		TOTAL ENERGY SAVINGS		NET LOST REVENUE		TOTAL NET * LOSS		EFFICIENCY INCENTIVE		MAXIMIZING INCENTIVE		TOTAL * INCENTIVE		TOTAL ESTIMATED COSTS TO BE RECOVERED	
PROGRAM DESCRIPTIONS		NUMBER (1)	NUMBER (2)	PER PARTICIPANT (3)	(4)/(1)	TOTAL ESTIMATED PROGRAM COSTS (4)	(KWH/PARTICIPANT) REV/DQTRS (5)	KWH/DQTR (6)	(2)*(6)	(KWH) REVENUE (7)	(5)*(7)	(EX. C, PG.21C) INCENTIVE (9)	(5% of COSTS) INCENTIVE (10)	(9)+(10)	(4)+(9)+(11)										
KENTUCKY POWER COMPANY ESTIMATED SECTOR SURCHARGES FOR 3 YEAR PROGRAM																									
YEAR 19 (1st HALF)																									
COMMERCIAL PROGRAMS																									
Smart Audit - Class 1		0	0	\$0.00		\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Class 2		0	0	\$0.00		\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Existing Building		0	0	\$0.00		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - New Building		0	0	\$0.00		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial A/C & Heat Pump Program																									
- Air Conditioner Replacement		2	1	\$0.00		\$4,324	121	121	\$0.07106	\$9	\$0	\$216	\$216	\$216	\$216	\$4,549	\$216	\$216	\$216	\$216	\$216	\$216	\$216	\$216	\$4,549
- Heat Pump Replacement		4	10	\$2,114.25		\$8,457	570	570	\$0.07108	\$405	\$0	\$423	\$423	\$423	\$423	\$9,285	\$423	\$423	\$423	\$423	\$423	\$423	\$423	\$423	\$9,285
HVAC Diagnostic & Tune-Up																									
- Air Conditioner		0	13	\$0.00	**	\$0	115	115	\$0.07109	\$106	\$0	\$0	\$0	\$0	\$0	\$106	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$106
- Heat Pump		12	45	\$855.92		\$10,271	349	349	\$0.07114	\$1,117	\$0	\$514	\$514	\$514	\$1,902	\$1,117	\$514	\$514	\$514	\$514	\$514	\$514	\$514	\$514	\$1,902
Commercial Incentive		80	79	\$9,495.53	**	\$759,542	8,788	8,788	\$0.07038	\$48,661	\$0	\$37,982	\$37,982	\$37,982	\$846,485	\$48,661	\$37,982	\$37,982	\$37,982	\$37,982	\$37,982	\$37,982	\$37,982	\$37,982	\$846,485
Commercial Load Management (Pilot Program)																									
- Air Conditioner		0	0	\$0.00		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
- Water Heating		0	0	\$0.00		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMMERCIAL PROGRAMS		98	148			\$782,694	717,273	717,273		\$50,498	\$0	\$39,135	\$39,135	\$39,135	\$872,327	\$50,498	\$39,135	\$39,135	\$39,135	\$39,135	\$39,135	\$39,135	\$39,135	\$39,135	\$872,327
INDUSTRIAL PROGRAMS - (w/Est. Opt-Outs Removed)																									
Smart Audit - Class 1		0	0	\$0.00		\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Audit - Class 2		0	0	\$0.00		\$0	0	0	n/a	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - General		0	0	\$0.00		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smart Financing - Compressed Air System		0	0	\$0.00		\$0	0	0	\$0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL INDUSTRIAL PROGRAMS		0	0			\$0	0	0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL COMPANY		136,916	125,460			\$2,114,876	7,795,603	7,795,603		\$457,403	\$192,317	\$41,632	\$41,632	\$41,632	\$2,806,228	\$457,403	\$192,317	\$192,317	\$192,317	\$192,317	\$192,317	\$192,317	\$192,317	\$192,317	\$2,806,228

* Lost revenue and efficiency/incentives are based on prospective values.
 ** Cumulative participants include a reduction for the cumulative participants as of 01/01/2009 (High Efficiency Heat Pump, Energy Education for Students and Community Outreach Program (CFI)).

KENTUCKY POWER COMPANY		Exhibit C		
FORECAST OF 2013 2nd HALF / 2014 1st HALF KENTUCKY RETAIL ENERGY SALES IN KWH		PAGE 22 of		22
FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SECTORS				
PROGRAM YR 18 2013 2nd HALF & YR 19 2014 1st HALF				
LINE NO.	YEAR	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
1	TOTAL ULTIMATE SALES (KWH) *	2,279,600,000	1,348,300,000	2,844,700,000
2	LESS NON-METERED **	13,677,600	8,089,800	17,068,200
3	TOTAL ESTIMATED RETAIL KWH SALES	2,265,922,400	1,340,210,200	2,827,631,800
4	LESS OPT - OUT CUSTOMERS KWH	0	0	0
5	KWH BEFORE LOST REVENUE IMPACTS	2,265,922,400	1,340,210,200	2,827,631,800
6	LESS LOST REVENUE IMPACTS ***	14,603,530	1,441,306	0
7	ADJUSTED KWH BY SECTOR	2,251,318,870	1,338,768,894	2,827,631,800
8	LINE 7/LINE 1	98.8%	99.3%	99.4%
LINE NO.	PROGRAM YR 18 (2nd HALF)	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
9	TOTAL ULTIMATE SALES (KWH) *	1,103,700,000	682,400,000	1,432,700,000
10	LINE 8	98.8%	99.3%	99.4%
11	ADJUSTED KWH BY SECTOR	1,090,455,600	677,623,200	1,424,103,800
LINE NO.	PROGRAM YR 19 (1st HALF)	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
12	TOTAL ULTIMATE SALES (KWH) *	1,175,900,000	665,900,000	1,412,000,000
13	LINE 8	98.8%	99.3%	99.4%
14	ADJUSTED KWH BY SECTOR	1,161,789,200	661,238,700	1,403,528,000
*	SOURCE: 2013 / 2014 LOAD FORECAST COMPILED BY AEP CORPORATE PLANNING AND BUDGETING DEPT.			
**	.60% ESTIMATED TO BE NON-METERED (OL) DETERMINED FROM BILLED JURISDICTIONAL TARIFF SUMMARY FOR 12 MOS. ENDED DECEMBER 2009.			
***	LOST REVENUE IMPACTS			
	Page 18B of 21, Column 6 - TOTAL RESIDENTIAL PROGRAMS	7,525,000	724,033	-
	Page 19A of 21, Column 6 - TOTAL RESIDENTIAL PROGRAMS	7,078,530	717,273	-
	TOTAL	14,603,530	1,441,306	-