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OCT 23 2008

PUBLIC SERVICE COMMISSION

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October 23, 2008

Mark R Overstreet (502) 209-1219 (502) 223-4387 FAX moverstreet@stites.com

HAND DELIVERED

Stephanie Stumbo
Executive Director
Public Service Commission of Kentucky
211 Sower Boulevard
P.O. Box 615
Frankfort, KY 40602-0615

RE: P.S.C. Case 2008-00349

Dear Ms. Stumbo:

Enclosed please find and accept for filing an original and seven copies of Kentucky Power Company's Responses to the Data Requests propounded by the Commission's October 13, 2008 Order.

By a copy of this letter, I am serving a copy of the Response on the Attorney General's Office of Rate Intervention. Please do not hesitate to contact me if you have any questions.

1111

cc: Dennis G. Howard, II

KE057:00KE4:16706:3:FRANKFORT



OCT 2 3 2008

PUBLIC SERVICE

COMMISSION

COMMONWEALTH OF KENTUCKY

BEFORE THE

PUBLIC SERVICE COMMISSION OF KENTUCKY

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) Case No. 2008-00349
RECOVER COSTS, NET LOST REVENUES AND)
RECEIVE INCENTIVES ASSOCIATED WITH THE)
IMPLEMENTATION OF THE KENTUCKY POWER)
COMPANY COLLABORATIVE DEMAND-SIDE)
MANAGEMENT PROGRAMS BEGINNING)
JANUARY 1, 2009)

KENTUCKY POWER COMPANY

RESPONSES TO COMMISSION STAFF FIRST SET OF DATA REQUESTS

October 23, 2008

KPCo Case No. 2008-00349 Commission Staff First Set of Data Request Order Dated October 13, 2008 Item No. 1 Page 1 of 2

Kentucky Power Company

REQUEST

Refer to Kentucky Power's response to Item 4(b) of the Commission Staff's March 11, 2008 data request in Case No. 2007-00477. The response indicates that, at that time, Kentucky Power had been considering load control programs for six to nine months as part of a rollout of advance metering infrastructure. It also stated that direct load control could be implemented sooner without advanced metering but that Kentucky Power believed the rollout of the two programs together was a more comprehensive solution and would provide greater benefits to both the company and its customers over the long run.

- a. Seven months have passed since that response was filed with the Commission. Describe the current status of Kentucky Power's plans for the rollout of direct load control and advanced metering infrastructure.
- b. Provide a detailed explanation for why Kentucky Power believes that the joint rollout of the two programs is a more comprehensive solution that will provide greater benefits to the company and its customers in the long run.

RESPONSE

(a&b)Kentucky Power continues to monitor technology advances in advanced metering infrastructure (AMI) and direct load control. Currently, the tentative plans are to roll out advanced metering infrastructure, including direct load control, within Kentucky Power Company's service territory during 2012.

Direct load control programs can be introduced without AMI. However, it would be inefficient to introduce the non-AMI direct load control program while AMI is being considered. For example, if Kentucky Power were to introduce direct load control programs in advance of the AMI infrastructure (which includes a communication system), it would require the Company and its ratepayers to install and maintain two communication systems. If the Company waits until the AMI infrastructure (including the AMI meters, thermostats and a communication system) are installed, the Company will only need to install and maintain one communication system, thus being less costly to the Company and its ratepayers.

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Vendors are working on smart thermostats that can use multiple communication technologies, which could accommodate the changing of the "processor card" and not the entire unit. These thermostats are in the early stages of production. When this technology is perfected it would be more feasible to deploy direct load control separate from AMI.

The AEP System in 2009 is deploying an AMI infrastructure in another AEP System's jurisdiction. This AMI deployment is open to approximately 10,000 customers and includes a voluntary direct load control program to those customers. Kentucky Power will closely monitor the results of this pilot program so we can benefit from any lessons learned.

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Kentucky Power Company

REQUEST

Provide the date of Kentucky Power's first billing cycle for the revenue months of December 2008 and January, February, and March of 2009.

RESPONSE

The first billing cycle for the revenue months are as follows:

Revenue Month and Year	Cycle 1 Billing Date
December 2008	November 25, 2008
January 2009	December 30, 2008
February 2009	January 29, 2009
March 2009	February 27, 2009

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Kentucky Power Company

REQUEST

The application does not include a proposed revision to Kentucky Power's demand-side management ("DSM") tariff and makes no mention of cost recovery.

- a. When does Kentucky Power plan to initiate recovery of costs associated with the three proposed DSM programs?
- b. If not planning to initiate recovery upon the proposed implementation of the programs in January 2009, when does Kentucky Power plan to do so?

RESPONSE

- (a) Dependent upon the Commission's approval of the three new proposed DSM programs, the Collaborative anticipates to begin incurring costs associated with the three new programs on or about January 1, 2009. Cost recovery is anticipated to begin on or about April 1, 2009. The cost recovery time table coincides with the required semi-annual status report of the DSM Collaborative which will be filed with the Commission on or about February 15, 2009. The February 15, 2009 filing will contain a proposed revision to Kentucky Power Company's DSM Tariff which will reflect the calculation of costs associated with the three new DSM programs being requested in this Application, as well as the other DSM programs previously approved by the Commission.
- (b) On or about April 1, 2009, the anticipated effective date of the February 15, 2009 filing.

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Kentucky Power Company

REQUEST

Provide the calculations, spreadsheets, or other work papers used to derive the expected savings and benefits and benefit/costs ratios associated with each of the three proposed programs.

RESPONSE

Upon reviewing the calculations, we discovered some errors. The errors have been corrected and revised spreadsheets have been attached.

An explanation of the corrections are as follows:

Community Outreach Compact Fluorescent Lighting Program

The total program costs for year 2011 in the original spreadsheet for Community Outreach Compact Fluorescent Lighting Program were \$53,000 and it should have been \$54,000. The revised spreadsheet now reflects the correct amount, which matches the program description filed in Case No. 2008-00349. The change in the yearly amount and the change in spreadsheet assumptions changed the TRC test results from 13.08 to 13.05, the RIM test results changed from 3.06 to 3.05, the Utility Cost test results changed from 30.28 to 30.08 and the Participant Cost test results remained the same. The Projected Program MW Savings assuming participation changed the system summer peak demand from 0.42 MW to 0.042 MW. This revision did not change the fact that this program is still cost effective.

The revised calculations and spreadsheets used to derive the expected savings are attached.

Energy Education for Student Program

The total program costs in the original spreadsheet for the Energy Education for Student Program for year 2009 were \$40,200 and the costs should have been \$22,000. Additionally, for year 2010, the total program costs were \$53,900 and the costs should have been \$31,000. And for Year 2011, the total program costs were \$53,000 and the costs should have been \$34,000. The revised spreadsheet now reflects the correct amounts, which matches the program description filed in Case No. 2008-00349. The change in the yearly amount and the change in spreadsheet assumptions changed the TRC test results from 8.09 to 11.21, the RIM test results changed from 2.39 to 2.84, the Participant test results changed from 28.73 to 29.31 and finally the Utility Cost test results changed from 12.55 to 21.64.

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On page 8 of 12, the Annual Expected Program Savings/Benefits @ 4,800 CFLs in one year have been revised. The Summer Peak Demand (kW) Reduction changed from 14 to 4. The Winter Peak Demand (kW) Reduction changed from 359 to 110. This Projected Program MWh Savings and kW Reduction reflects the assumed participation change. This participation change resulted in the Energy Savings changing from 717.6 MWh to 901.6 MWh. The Demand Reduction @ system winter peak changed from 110 kW to 451 kW. The Demand Reduction @ system summer peak changed from 4 kW to 18 kW. These revisions did not change the fact that this program is still cost effective.

The revised calculations and spreadsheets used to derive the expected savings are attached.

High Efficiency Heat Pump Program

The calculations and spreadsheets used to derive the expected savings are attached.

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Kentucky Power Company Community Outreach Compact Fluorescent Lighting (CFL) Program Expected Savings / Benefits

Projected Program MWh Savings and MW Reduction Assuming Participation Goal of 46,000 CFLs is achieved (all customers in three years)	As <u>Filed</u>	Revised
Demand Reduction - @ System Summer Peak (MW)	0.420	0.042
COST / BENEFIT ANALYSIS		
Total Resource Cost	13.08	13.05
Ratepayer Impact Measure	3.06	3.05
Utility Cost	30.28	30.08

Kentucky Power Company Community Outreach Compact Fluorescent Lighting Program

	Communic	A Oditescu combasi	• • • • • • • • • • • • • • • • • • • •	
Total Program for 3 Years			Total Program for 3 Years Winter Peaking KPC	15
400			Winter Peaking KPC Example of Compact Fluorescent Lamp Savings over	er an Incandescent Bulb
Summer Peaking KPC Example of Compact Fluorescent Lamp Savings over	ır an Incandescent Bulb		Example of Compact Floorescent and	
Example of Compact Fluorescent Lamp Savings over	1 417 01-2011			89 walls
	69 walls		Incandescent	23. walls
Incandescent	No. 47 N. 100 N.		CFL	1,000 hours
CFL	23 walls		Annual Hours of Operation	
	1,000 hours		Number of walts to a kilowatt hour	1,000 Conversion Factor
Annual Hours of Operation	1,000 Conversi	on Factor		46 g5-g6
Number of walls to a kilowall hour	46 c5-c6		Wall Savings	46,000 g9 * g7
Walt Savings	46,000 c9*c7		Wall Hour Savings	Eslimale
Wall Hour Savings	0.02 Estimate		% operating at time of peak	23 =g9*g11
% operating at time of peak	0.92 =C9°C1		Coincident Peak Walt Hour Savings per Lamp*	Distribution and a second
Coincident Peak Watt Hour Savings per Lamp*	naz =ca c.	•		
Contractive Contractive			Number of Lemps Distributed	46,000
- Distributed	46,000		Matter of Fambs programme	
Number of Lamps Distributed	PRONE STREET, SALES AND AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDR			2,116,000 =g14°g10/g8
	2.115,000 =C14°C	10/C8	Program Annual kWh Savings	•
Program Annual kWh Savings	2,110,000			1,058 =g12*g14/gB
,	0.000	4.4100	Program Coincident Peak kW Savings	1'000 -815 81B.
Program Coincident Peak kW Savings	42 =C12*C	14/60		
Program Conclosing Commission			*Diversified Demand Given Operating Conditions	
Conditions			Diversined neuralid Oren Obergrans -	
*Diversified Demand Given Operating Conditions				
Unit Wattage Derivation	o initial pulib Sovings	per Replacement		
		37		
	60	52		
	75			
	100	77		
	40	17		
_ :	69	46		
Average Wattage and Energy Savings	- -			
			First Year	
First Year			Winter Peaking KPC	en inemidescent Ruib
Summer Peaking KPC			Winter Peaking KPC Example of Compact Fluorescent Lamp Savings	OASL BU INCRINGACOUS COLO
Summer Peaking NPC Example of Compact Fluorescent Lamp Savings of	over an incandescent Bulb			
Example of Garyant			Incandescent	69 wells
	walls 28			23 walls
Incandescent	23 watts		CFL	1,000 hours
CFL.	1,000 hours		Annual Hours of Operation	1,000 Conversion Factor
Annual Hours of Operation	1,000 Conve	rsion Factor	Number of walts to a kilowalt hour	46
Number of watts to a kilowatt hour	•	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Walt Savings	
Wall Savings	46		Walt Hour Savings	46,000
	46,000		% operating at time of peak	0,5 Estimate
Wall Hour Savings	0,02 Estima	ale	Coincident Peak Walt Hour Savings per Lamp*	23
% operating at time of peak	0.92		Coincident Poek year from 5271193 per 24117	Bart Garde Store - A.
Coincident Peak Watt Hour Savings per Lamp*	Management of the second of th			14.000
	14 nnn		Number of Lamps Distributed	
Number of Lamps Distributed	14,000			-44 +05
F444,744 G			Program Annual kWh Savings	644,000
Program Annual kWh Savings	644,000		1,108(cm, 1,111-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	
Stoffigg Wilder variations of			Program Coincident Peak kW Savings	322
	13		Stodism Collegent Leaves as against	
Program Coincident Peak kW Savings				NT.
	_		*Diversified Demand Given Operating Condition	na -
*Diversified Demand Given Operating Condition	5			
Mark and the second sec				

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Kentucky Power Company Community Outreach Compact Fluorescent Lighting Program

Total Program for 3 Years

Summer Peaking KPC Example of Compact Fluorescent Lamp Savings	over an incandescent Bulb	Winter Peaking KPC Example of Compact Fluorescent Lamp	Savings over an Incandescent Bulb
Incandescent CFL Annual Hours of Operation Number of watts to a kilowatt hour Watt Savings Watt Hour Savings % operating at time of peak Coincident Peak Watt Hour Savings per Lamp* Operating Life	69 watts 23 watts 1,000 hours 1,000 Conversion Factor 46 46,000 0.02 Estimate 0.92 7,000 Hours	Incandescent CFL Annual Hours of Operation Number of watts to a kilowatt hour Watt Savings Watt Hour Savings % operating at time of peak Coincident Peak Watt Hour Savings per	## Watts ### Watts ### Watts ### Watts ### Watts ### Watts ### Hours #### Conversion Factor #### 46,000 #### ##############################
Number of Lamps Distributed Program Annual kWh Savings	2,116,000	Number of Lamps Distributed Program Annual kWh Savings	2,116,000
Program Coincident Peak kW Savings	42	Program Coincident Peak kW Savings	1,058
*Diversified Demand Given Operating Condition	is	*Diversified Demand Given Operating C	Conditions
	ANNUAL B UDGET		
	Year i	Year 2	Year 3

		Year i Year 2	Yea	<u> </u>
CFLs		\$35,000	\$40,000	\$40,000
Promotion		\$3,200	\$3,900	\$4,000
Administration		\$2,000	\$2,000	\$2,000
Evaluation		<u>\$ 0,000</u>	\$8,000	\$8,000
	TOTAL COSTS	\$40,200	\$63,900	\$54,000

Kentucky Power Company Community Outreach Compact Fluorescent Lighting Program

Community Outreach Program 2009

Commun	nty Outre	acn Progra	iiii 2009			ı									
	Program	Danafite			Participant Benefits	Progr Cos			Participant Costs		Lost	Revenues		Avolded Costs	
	Program	Deliantz													
Year	MWH Program Energy Savings	Program Capacity Saving (Summer) kW	Energy (\$)	Capacity (\$)	Avoided Energy Charges	Progi Cos		Replace- ment CFL's (N)	Participant Costs	Participant energy Rate	Lost Margin	Lost Marginal Revenues		KPC (\$MWh) All Haurs	CT (\$ kW- year)
rear	Gavings	N. F.	, (+,	1-7								(PER D44 70)	2009	44,4949325	70 0488638
2009	544	0.01	28,654.74	1.03	\$41,699.00		40,200)			\$0,08	\$0.02	(\$53,244.26) (\$60,045.46)		44,4507273	
2010		0.03	57,252.54	2.10	\$83,398.00		553,900)			\$0.06	\$0.02	(\$93,604.56)		46.0292176	
2011	-	0.04	97,376.65	3.52	\$136,981.22	(5	54,000)			\$0.06	\$0.02 \$0.02	(\$33,997.84)		48.6829657	84,8423739
2012		0.04	103,013.16	3.59	\$137,011.00	1				\$0.06	\$0.02 \$0.02	(\$33,055.03)			86,5392214
2013		0.04	103,955.97	7 3.66	\$137,011.00	I				\$0.06 \$0.06	\$0.02	(\$31,896.70)		49.6759437	88.2700058
2014	2,118	0.04	105,114.30	3.74	\$137,011.00					· · ·	\$0.02 \$0.01	(\$11,766.94)		59.1890647	90.0354059
2015	2,116	0.04	125,244.08	3 3,81	\$137,011.00					\$0.05	\$0.01	(\$35,414.87)		60.9632936	91.838114
2016	2,116	0.04	128,998.3	3 3.89	\$164,413.20			14,000	(\$28,000.00)	\$0.08 \$0.08	\$0.02	(\$33,587.07)		61.8270927	
2017	2,116	0.04	130,826.13	3 3.79	\$164,413.20	i		16,000	(\$32,000.00)		\$0.02	(\$28,702.B1)		64.1353456	
2018	2,116	0.04	135,710.3	9 3.83	\$164,413.20			16,000	(\$32,000.00)	\$0.08 \$0.08	\$0.01	(\$23,586.32)	2019	66,553344	
2019	2,116	0.04	140,828.8	8 3,84	\$164,413.20	l				\$0.08	\$0.01	(\$18,400.86)		69,0039401	90,0434973
2020	2,116	0.04	146,012.3	4 3.81	\$164,413.20					\$0.09	\$0.02	(\$46,805.99)		71,1199857	90,5516628
2021	2,116	0.04	150,489.6		\$197,295.84					\$0.09	\$0.02	(\$42,514,37)			90.5191541
2022	2,116	0.04	154,781.4		\$197,295.84			44.000	(\$28,000.00)	\$0.08	\$0.02	(\$47,621,22)		70.7346994	
2023	2,116	0,04	149,674.6		\$197,295.84	l		14,000	(\$28,000.00)	\$0.08	\$0.02	(\$41,265.24)	2024	73,7384679	90,4975765
2024	2,116	0.04	156,030.6		\$197,295.84	I		16,000	•	\$0.09	\$0.02	(\$34,755.85)		76.8147405	90.4398938
2025	2,116	0,04	162,539.9		\$197,295,84	1		16,000	(\$32,000.00)	\$0.09	\$0.02	(\$28,775.10)	2026	79.6411834	90.3852554
2026	2,116	0.04	168,520.7		\$197,295.84	- 1				\$0.09	\$0.01	(\$22,176.01)	2027	82.7598437	90.4596287
2027	2,116	0.04	175,119.8		\$197,295.84					\$0.11	\$0.03	(\$55,415.32)	2026	85.699288	90.4249702
2028	2,116	0.04	181,339.6		\$236,755.01					\$0,11	\$0.02		2029	89.1435105	90.4166657
2029	2,116	0.04	188,627.6		\$236,755.01	1		14,000	(\$28,000.00)	\$0.11	\$0,02		2030	92.5609584	90.4409154
2030		0.04	195,659.0		\$236,755.01	1		16,000	(\$32,000.00)	\$0,11	\$0.02	•	2031	94.1530171	90.4248595
2031	2,116	0.04	199,227.7		\$236,755.01	l		16,000	(\$32,000.00)	\$0.11	\$0.02		2032	95,7724489	90,4261145
2032		0.04	202,654.5		\$238,755.01	1		10,000	(402,000.00)	\$0.13	\$0.04	(\$77,965.85)	2033	97,4197351	90,4330966
2033		0.04	206,140.1		\$284,106,01					\$0.13	\$0.04	(\$74,420.24)	2034	99,0953545	90,4266507
2034		0.04	209,685.7		\$284,106.01	1				\$0.13	\$0.03	(\$70,613.64)	2035	100.799795	90.4285313
2035	5 2,116	0.04	213,292.3		\$284,106.01	1				\$0,13	\$0.03		2036	102.533551	90,4301871
2036			216,960.9		\$284,106.01	1		14,000	(\$28,000.00)	\$0.13	\$0.03		2037	104.297128	90.427567
2037	7 2,116	0.04	220,692.7	2 3.83	\$284,106.01			17,000	(420,500,00)						
Total	ED OS A	1,18	\$ 4,454,623.2	3 \$ 105.67	\$5,617,564.18	(\$	148,100)		(\$304,000,00)			(\$1,311,040.95)			
	59,064	1,10	\$1,657,952.1		\$2,089,681.17		5,091.28)	\$0.00	(\$71,924.82)			(\$487,690.27)			
PV(C)			\$2,989,581.7		\$3,770,053.34		9,392.71)	\$0,00	(\$204,020,14)			(\$879,864.32)			
PV(Sec)			98,000,401.1	T1 T1 VA											

Community Outreach Program 2009

Test	NPV	Benefit/Cost Ratio
Total Resource	\$1,530,085.40	13.05
Participant	\$2,161,585.99	29.05
RIM	\$1,114,319.95	3.05
Utility	\$1,602,010.22	30,08
Societal	\$2,686,239.60	9.85

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Kentucky Power Company Energy Education for Students Program Expected Savings / Benefits

Annual Expected Program Savings/Benefits @ 4,800 CFLs in One Year	As <u>Filed</u>	Revised
Summer Peak Demand (kW) - Reduction	14	4
Winter Peak Demand (kW) - Reduction	359	110
Projected Program MWh Savings and kW Reduction Assuming Participation Goal of 19,600 CFLs is achieved (all students in three years)		
Energy Savings - MWh	717.6	901.6
Demand Reduction - @ System Winter Peak (kW) @ System Summer Peak (kW)	110 4	451 18
COST / BENEFIT ANALYSIS		
Total Resource Cost	8.09	11.21
Ratepayer Impact Measure	2.39	2.84
Participant	28.73	29.31
Utility Cost	12.55	21.64

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Kentucky Power Company Energy Education for Student Program

Total Program for 3 Years Summer Peaking KPC Example of Compact Fluorescent Lamp Savings or	ver an Incandescent Bulb	Total Program for 3 Years Winter Peaking KPC Example of Compact Fluorescent Lamp Savings or	ver an Incandescent Bulb
Incandescent CFL Annual Hours of Operation Number of walts to a kilowalt hour Watt Savings Watt Hour Savings % operating at time of peak Coincident Peak Watt Hour Savings per Lamp*	69 watts 23 watts 1,000 hours 1,000 Conversion Factor 48 c5-c6 48,000 c9*c7 0,02 Estimate 1,082 =C9*C11	Incandescent CFL Annual Hours of Operation Number of walts to a kilowalt hour Walt Savings Walt Hour Savings % operating at time of peak Coincident Peak Walt Hour Savings per Lamp*	69 walls 23 walls 1,000 hours 1,000 Conversion Factor 46 g5-g6 46,000 g9*g7 0.6 Estimate 23 =g9*g11
Number of Lamps Distributed	19,800	Number of Lamps Distributed	19,800
Program Annual kWh Savings	901,600 =C14°c10/C8	Program Annual kWh Savings	901,600 =g14*g10/g8
Program Coincident Peak kW Savings	18 =C12*C14/C8	Program Coincident Peak kW Savings	451 =g12*g14/g8
*Diversified Demand Given Operating Conditions		*Diversified Demand Given Operating Conditions	
Unit Wattage Derivation	Original Bulb Savings per Replacement 60 37 75 52 100 77 40 17		
Average Wattage and Energy Savings	69 46		
First Year Summer Peaking KPC Example of Compact Fluorescent Lamp Savings o	ver an incandescent Bulb	Winter Peaking KPC Example of Compact Fluorescent Lamp Savings o	ver an Incandescent Bulb
Incandescent CFL Annual Hours of Operation Number of walts to a kilowalt hour Walt Savings Walt Hour Savings % operating at time of peak Coincident Peak Walt Hour Savings per Lamp*	89 walts 23 walts 1,000 hours 1,000 Conversion Factor 46 46,000 0.02 Estimate	Incandescent CFL Annual Hours of Operation Number of watts to a kilowatt hour Watt Savings Watt Hour Savings % operating at time of peak Coincident Peak Watt Hour Savings per Lamp*	1,000 key
Number of Lamps Distributed	4,800	Number of Lamps Distributed	4,800
Program Annual kWh Savings	220,800	Program Annual kWh Savings	220,800
Program Coincident Peak kW Savings	4	Program Coincident Peak kW Savings	110
*Diversified Demand Given Operating Conditions		*Diversified Demand Given Operating Conditions	

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Kentucky Power Company Energy Education for Student Program

Total Program for 3 Years

Summer Peaking KPC Example of Compact Fluorescent Lamp Savings	over an Incandescent Bulb		Winter Peaking KPC Example of Compact Fluores	cent Lamp Sav	ings over an Incandescent	Bulb
Incandescent CFL Annual Hours of Operation Number of watts to a kilowatt hour Watt Savings Watt Hour Savings % operating at time of peak Coincident Peak Watt Hour Savings per Lamp* Operating Life	69 watts 23 watts 4,000 hours 1,000 Conversion 46 46,000 0,002 Estimate 0,92 7,000 Hours 19,600	Factor	Incandescent CFL Annual Hours of Operation Number of watts to a kilowatt Watt Savings Watt Hour Savings % operating at time of peak Coincident Peak Watt Hour S Number of Lamps Distributer	Savings per La	69 watts 23 watts 1,000 hours 1,000 Conversio 46 46,000 0,5 Estimate 23	n Factor
Number of Lamps Distributed Program Annual kWh Savings	901,600		Program Annual kWh Saving		901,600	
Program Coincident Peak kW Savings	18		Program Coincident Peak kV	V Savings	451	
*Diversified Demand Given Operating Condition	s		*Diversified Demand Given	Operating Cond	itions	
	ANNUAL BUDGET					
		Year 1	<u>Year 2</u>	2	<u>/ear_3</u>	
CFLs		\$12,000		\$17,000	\$20,000	
Promotion Educational Workshiop / Food Administration/Development		\$1,000 \$6,000 \$4,000		\$1,000 \$5,000 \$3,000	\$1,000 \$5,000 \$3,000	
Evaluation		\$.0.00		<u>\$5,000</u>	<u>\$5,000</u>	
	TOTAL COSTS	\$22,000	District Control of the Control of the	\$31,000	,,,,\$34,000	

Kentucky Power Company Energy Education for Student Program

Needs Program 2009

Program Capacity Saving Capacity C		Program	Benefits			Participant Benefits	Program Costs		Participant Costs			Lost Revenues	,	Avolded Costs	
Program Saving Capacity Capacity Capacity Capacity Capacity Capacity Capacity Control Cost			Program												
Final Final Content Final		MWH													
Pear Samps W		Program	Saving												
Year Strings AVV Energy (3) (3) Charges (52,200) \$0.03 \$10.00 \$0.02.44.60 \$0.35 \$14,208.00 \$13,000 \$0.00 \$10.00 \$0.00 \$0.00 \$10.00 \$0.00 \$10.00 \$0.00 \$10.00 \$0.00 \$10.00 \$0.00 \$10.00 \$0.00 \$1		Energy	(Summer)		Capacity	Energy							(
2009 221 0.00 9,824.48 0.35 \$14,298.89 (\$3,1009) \$0.00 \$0.00 \$0.00 \$0.00 \$44,4007.23 \$1,400.89 \$1,400.89 \$1,400.99 \$	Year	Savings	kW	Energy (\$)	(\$)	Charges		(N)	Costs		_		2000		
2010 442 0.01 [8,629.44 0.72 23,9,93.00] (\$31,000)	2009	221	0.00	9,824.46	0.35								•		
2011 716 0.02 33.071.22 15.0 340.021 35.071.20 15.0 340.021 35.071.20 15.0 340.021 35.000 30.02 (314.468.04) 2012 48.8022667 84.802373.000 2013 902 0.02 44.304.28 15.6 350.378.60 50.05 50.05 50.02 (315.500.77) 2014 49.075947 88.230221 49.000 50.05 50.02 (315.500.77) 2014 49.075947 88.230221 49.000 50.05 50.02 (315.500.77) 2014 49.075947 88.230221 49.000 50.05 50.02 (315.500.77) 2014 49.075947 88.230231 49.000 50.05 50.02 (315.500.77) 2014 49.075947 88.230231 49.000 50.05 50.02 (315.500.78) 2015 902 0.02 45.06451 15.6 370.054.32 4.800 (38.00.00) 50.06 50.02 (315.000.01) 2015 60.082303 51.0818 15.000 50.000 50.000 50.00 50.02 (315.000.01) 2015 60.082303 51.0818 15.000 50.0000 50.000 50.000 50.000 50.000 50.000 50.000 50.000 50.000 50.0000 50.0000 50.000 50.000 50.0000 50.000 50.0000 50.0000 50.000 50.0000 50.000	2010	442	0.01	19,629.44	0.72										
2012 902 0.02 43,982.56 1.59 \$59,378.60 \$0.00 \$11,000.00 \$0.00 \$11,000.00 \$10.00 \$0.00 \$11,500.77 \$2014 \$40,1285.20 \$68,302.21 \$41,408.20 \$68,302.21 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,300.2 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$68,400.20 \$41,408.20 \$41	2011	718	0.02	33,071.22	1.50		(\$34,000)								
2013 902 0.02 44,781.8 1.59 558,378.60 50.02 (\$13,590.77) 2014 49.8759437 88.2700968 2015 902 0.02 53,364.86 1.02 558,378.60 50.05 5	2012	902	0.02	43,892.56	1.53							,			
2014 902 0.02 44,787.83 1.59 55,776.80	2013	902	0.02	44,294.28	1.56										
2016 902 0.02 55,364.88 152 559,374.00 (59,600.00) 50.08 50.02 (515,588.81) 2016 60.6832039 91.838114 (2017 902 0.02 55,743.31 1.61 \$70,054.32 0.600 (515,600.00) 50.08 50.02 (514,311.01) 2017 61.6270027 69.452239 (2018 902 0.02 57,824.43 1.53 \$70,054.32 0.600 (515,600.00) 50.08 50.01 (512,229.69) 2018 64.133540 90.5385440 90.200 60.004.49 1.64 \$70,054.32 0.600 (515,600.00) 50.08 50.01 (510,049.03) 2019 66.53344 90.254224	2014	902	0.02	44,787.83	1.59										
2016 902 0.02 54,884.51 1.65 \$70,943.22 0.800 (\$13,600.00) \$0.08 \$0.01 (\$12,226.00) \$0.01 64,1325450 0.825442 2018 902 0.02 57,724.33 1.61 \$70,954.32 0.800 (\$16,000.00) \$0.08 \$0.01 (\$12,226.00) \$0.01 64,1335450 0.825442 2019 902 0.02 60,004.49 1.64 \$70,054.32	2015	902	0.02	53,384.86	1.62								=: -		
2017 902 0.02 55,743.31 1.91 570,054.32 8,000 (\$16,000.00) \$0.01 (\$12,228.89) 2018 64,1353458 90.5385449 2019 902 0.02 0.02 06,004.49 1.64 \$70,054.32 8,000 (\$16,000.00) \$0.08 \$0.01 (\$10,049.03) 2019 66,553344 90.254224 2020 902 0.02 06,121.70 1.63 \$84,095.18 \$0.08 \$0.01 (\$10,049.03) 2019 66,553344 90.0244273 2021 902 0.02 64,121.70 1.63 \$84,095.18 \$0.08 \$0.01 (\$10,000.00) \$0.09 \$0.02 (\$18,14.62) 2022 71,1119957 90.251628 2022 902 0.02 03,774.40 1.83 \$84,095.18 4,800 (\$9,600.00) \$0.09 \$0.02 (\$17,502.56) 2024 73,7346979 90.4975762 2025 902 0.02 06,452.60 1.63 \$84,095.18 6,800 (\$16,000.00) \$0.09 \$0.02 (\$17,502.56) 2024 73,7346979 90.4975762 2026 902 0.02 09,256.17 1.63 \$84,095.18 6,800 (\$16,000.00) \$0.09 \$0.02 (\$16,14.62) 2022 74,804.69 1.83 284,095.18 6,800 (\$16,000.00) \$0.09 \$0.02 (\$16,400.01) 2025 78.814705 90.4975762 2026 902 0.02 90,256.17 1.63 \$84,095.18 6,800 (\$16,000.00) \$0.09 \$0.02 (\$16,400.01) 2025 78.814705 90.4975762 2027 902 0.02 74,816.28 1.83 384,095.18 8,000 (\$16,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.02 (\$16,400.01) 2025 78.814705 90.4975762 2028 902 0.02 77,266.49 1.63 \$100,878.22 \$0.00 \$0.01 (\$0,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.02 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.09 \$0.01 (\$10,000.00) \$0.00 \$0.0	2016	902	0.02	54,964.51	1,68			-							
2018 902 0.02 57,824.43 1.93 \$70,054.32 50.08 50.01 (\$10,049.03) 2019 66.55344 90.254224 2020 902 0.02 62,213.95 1.02 \$70,054.32 50.08 50.01 (\$7,640.37) 2020 66.55344 90.2546224 2020 902 0.02 64,121.76 1.63 \$84,065.18 50.09 \$0.02 (\$19,943.42) 2021 71,1199857 90.5516628 2022 902 0.02 65,550.35 1.63 \$84,065.18 50.09 \$0.02 (\$19,040.07) \$0.09 \$0.02 (\$18,114.62) 2022 73,146149 90.5191541 2023 902 0.02 65,626.26 1.63 \$84,065.18 4.60 (\$9,600.09) \$0.09 \$0.02 (\$17,602.59) 2024 73,7384679 90.4975765 2024 902 0.02 66,462.60 1.63 \$84,065.18 8.00 (\$16,000.00) \$0.09 \$0.02 (\$17,602.59) 2024 73,7384679 90.4975765 2025 902 0.02 69,256.17 1.63 \$84,065.18 8.00 (\$16,000.00) \$0.09 \$0.02 (\$14,009.01) 2025 76,8147405 90.4396736 2025 902 0.02 71,604.49 1.53 \$84,065.18 8.00 (\$16,000.00) \$0.09 \$0.02 (\$14,009.01) 2025 76,8147405 90.4396736 2026 902 0.02 71,604.49 1.53 \$84,065.18 8.00 (\$16,000.00) \$0.09 \$0.02 (\$14,009.01) 2025 76,8147405 90.4396736 2026 902 0.02 74,816.28 1.63 \$84,065.18 8.00 (\$16,000.00) \$0.09 \$0.01 (\$12,006.99 2026 74,816.28 80.80 80.80 80.80 80.00 (\$16,000.00) \$0.09 \$0.00 (\$16,000.00) \$0.09 \$0.00 (\$16,000.00) \$0.09 \$0.00 (\$17,409.01) 2027 76,9411634 90.4596287 2027 902 0.02 74,816.28 1.63 \$84,065.18 80.00 (\$16,000.00) \$0.09 \$0.01 (\$12,006.99 2026 76,9411634 90.4596287 2026 902 0.02 80,371.79 1.93 \$100,878.22 \$0.01 \$0.01 \$0.00 \$0.00 \$0.01 \$0.00 \$0.00 \$0.01 \$0.00 \$0.0	2017	902	0.02	55,743.31	1,61			-							
2019 902 0.02 60,004.49 1.64 \$70,094.32	2018	902	0,02	57,824.43	1.63			8,000	(\$16,000.00)						
2021 902 0.02 64,121.76 1.63 584,065.18 50.09 50.02 (519,943.42) 2021 71,119967 90.5516628 2022 902 0.02 65,950.36 1.63 584,065.18 50.09 50.02 (516,114.62) 2022 73.1481419 90.591624 2023 902 0.02 63,774.40 1.63 584,065.18 4,600 (59,600.00) 50.09 50.02 (520,290.78) 2023 70.2481619 90.4975765 90.4975765 90.4975765 90.2014 90.2	2019	902	0.02	60,004.49	1.64							• • •			
2021 902 0.02 64,121.76 1.63 \$84,065.18	2020	902	0.02	62,213.95	1.62										
2022 902 0.02 65,993.85 1.53 \$84,085.16	2021	902	0.02	54,121.76	1.63	· ·									
2023 902 0.02 65,474.40 1.83 \$84,095.18	2022	902	0.02	65,950.36	1.63										
2024 902 0.02 69,256.17 1.63 \$84,065.18 8,000 (\$16,000.00) \$0.09 \$0.01 (\$12,200.669) 2026 79.6147405 90.4398938 90.2026 902 0.02 71,604.49 1.63 \$84,065.18 8,000 (\$16,000.00) \$0.09 \$0.01 (\$12,200.669) 2026 79.6147405 90.3892554 90.2027 802 0.02 74,616.28 1.63 \$84,065.18 \$0.09 \$0.01 (\$9,48.91) 2027 82.7588437 90.4596287 90.2028 902 0.02 77,266.48 1.63 \$100,078.22 \$0.00,079.759 902 0.02 80,371.79 1.63 \$100,078.22 \$0.00,079.759 902 0.02 80,371.79 1.63 \$100,078.22 \$0.00,079.759 902 0.02 81,485.07 1.63 \$100,078.22 \$0.00,079.759 902 0.02 81,486.38 1.63 \$100,078.22 \$0.00,079.759 902 0.02 \$0.00,079.759 90.200.00 \$0.00,079.759 90.20	2023	902	0.02	63,774.40	1.63	\$84,065.18									
2025 902 0.02 69,256.77 1.63 \$84,095.18	2024	902	0.02	66,482.60	1.63										
2026 902 0.02 74,864.49 1.63 \$84,065.18 \$0.09 \$0.01 (\$9,448.91) 2027 82,7598437 90.4598287 2020 902 0.02 77,266.48 1.63 \$100,878.22 \$0.11 \$0.03 (\$23,611.74) 2028 85,699286 90.4249702 2029 902 0.02 80,371.79 1.63 \$100,878.22 \$0.00 (\$59,600.00) \$0.11 \$0.02 (\$15,998.66) 2021 \$9,448.91 \$0.00	2025	902	9.02	69,256.17	1,63			8,000	(\$16,000.00)						
2027 902 0.02 74,616.28 1.63 \$100,878.22 \$0.11 \$0.03 \$(\$33,611.74) 2028 85,699286 90.4249702 2028 902 0.02 80,371.79 1.63 \$100,878.22 \$0.11 \$0.02 \$(\$20,506.43) 2029 89,1455105 90.4166657 2030 902 0.02 83,452.97 1.63 \$100,878.22 \$4,800 \$(\$9,600.00) \$0.11 \$0.02 \$(\$17,425.25) 2030 92.5609884 90.4469154 2031 902 0.02 84,889.36 1.63 \$100,878.22 \$6,800 \$(\$13,600.00) \$0.11 \$0.02 \$(\$15,999.86) 2031 94,1530171 90.4469154 2032 902 0.02 86,348.44 1.63 \$100,878.22 \$6,800 \$(\$13,600.00) \$0.11 \$0.02 \$(\$15,999.86) 2031 94,1530171 90.426145 2033 902 0.02 87,833.63 1.63 \$121,053.86 \$0.00	2026	902	0.02	71,804.49	1.63	· ·						• •			
2028 902 0.02 77,266.48 1.63 \$100,878.22	2027	902	0.02	74,616.28	1.63	·							*		
2029 902 0.02 80,371.79 1.63 \$100,878.22 4,800 (\$9,600.00) \$0,11 \$0.02 (\$17,425.25) 2030 92.5609684 90.4409154 2031 902 0.02 84,889.36 1.63 \$100,878.22 8,800 (\$13,600.00) \$0,11 \$0.02 (\$15,989.86) 2031 94.1530171 90.4248595 2032 902 0.02 86,348.44 1.63 \$100,878.22 8,800 (\$16,000.00) \$0,11 \$0.02 (\$14,529.76) 2032 95,7724489 90.426145 2033 902 0.02 87,833.63 1.63 \$121,053.86 \$0.13 \$0.04 (\$33,20.23) 2033 90.409154 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.426595 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.205 90.426595 2034 90.205 90.205 90.444.25 1.63 \$121,053.86 \$0.13 \$0.03 (\$0.172.77) 2035 100,799795 90.4265313 2036 902 0.02 92,444.25 1.63 \$121,053.86 \$0.13 \$0.03 (\$0.172.77) 2035 102,53351 90.426595 2036 902 0.02 92,444.25 1.63 \$121,053.86 \$0.13 \$0.03 (\$0.172.77) 2035 102,53351 90.426595 2036 902 0.02 92,444.25 1.63 \$121,053.86 \$0.13 \$0.03 (\$0.172.77) 2035 102,53351 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036 90.205 90.426595 2036	2028	902	0.02	77,266.48	1,63	· i									
2030 902 0.02 83,652.97 1.63 \$100,878.22 4,800 (\$39,800.00) \$0.11 \$0.02 (\$15,999.66) 2031 94.1530171 90.4248595 2032 902 0.02 86,348.44 1.63 \$100,878.22 8,800 (\$13,500.00) \$0.11 \$0.02 (\$14,529.78) 2032 95.7724489 90.4261145 2033 902 0.02 87,833.63 1.63 \$121,053.86 50.13 \$0.04 (\$33,220.23) 2033 97.4197351 90.4248595 2034 902 0.02 89,344.37 1.63 \$121,053.86 50.13 \$0.04 (\$31,709.49) 2034 90.2035 902 0.02 90,881.09 1.63 \$121,053.86 50.13 \$0.04 (\$31,709.49) 2034 90.4266507 2035 902 0.02 90,881.09 1.63 \$121,053.86 50.13 \$0.03 (\$50,079.77) 2035 100.79976 90.4266507 2036 902 0.02 92,444.25 1.63 \$121,053.86 50.13 \$0.03 (\$50,079.77) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$50,090.00) \$0.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 1.63 \$121,053.86 50.13 \$0.03 (\$77,019.57) 2037 104.297126 90.427657 2037 902 0.02 94,034.29 90.427657 2037 902 0.02 94,034.29 90.427657 902 90.427657 902 902 902 902 902 902 902 902 902 902	2029	902	0.02	80,371.79	1,63										
2031 902 0.02 84,688.36 1,53 \$100,878.22 8,000 \$(\$16,000.00) \$0.11 \$0.02 \$(\$14,529.76) 2032 95.7724489 90.4261145 2033 902 0.02 87,633.63 1,63 \$121,053.86 \$0.13 \$0.04 \$(\$33,220.23) 2033 97.4167351 90.4330966 2034 902 0.02 89,344.37 1,63 \$121,053.86 \$0.13 \$0.04 \$(\$31,709.49) 2034 89,0953545 2035 902 0.02 90.881.09 1,63 \$121,053.86 \$0.13 \$0.04 \$(\$31,709.49) 2034 89,0953545 2035 902 0.02 90.881.09 1,63 \$121,053.86 \$0.13 \$0.03 \$(\$30,172.77) 2035 100.799765 90.4266507 2036 902 0.02 92,444.25 1,63 \$121,053.86 \$0.13 \$0.03 \$(\$28,609.62) 2036 102.533551 90.4301671 2037 902 0.02 94,034.29 1,63 \$121,053.86 \$4,600 \$(\$9,600.00) \$0.13 \$0.03 \$(\$27,019.57) 2037 104.297128 90.427667	2030	902	0.02	83,452.97	1,63	\$100,878.22								• • • • • • • • • • • • • • • • • • • •	
2032 902 0.02 88,348.44 1.63 \$104,076.22 2,300 (\$10,505.56) 50.13 \$0.04 (\$33,220.23) 2033 97.4197.351 90.4330966 2034 902 0.02 89,344.37 1.63 \$121,053.86 50.13 \$0.04 (\$31,709.49) 2034 99.9953545 90.4266507 2035 902 0.02 90.881.09 1.63 \$121,053.86 \$0.13 \$0.03 (\$50,172.77) 2035 100.799785 90.4265313 2036 902 0.02 92,444.25 1.63 \$121,053.86 \$0.13 \$0.03 (\$50,072.77) 2035 102.53351 90.4265313 2037 902 0.02 94,034.29 1.63 \$121,053.86 4,600 (\$9,600.00) \$0.13 \$0.03 (\$27,019.57) 2037 104.297128 90.427867	2031	902	0.02	84,888.36	1.63	\$100,878.22	İ								
2033 902 0.02 87,433.83 1.63 \$121,053.86 \$0.13 \$0.04 \$(\$31,709.49) 2034 99.0953545 90.4266507 2034 902 0.02 89,344.37 1.63 \$121,053.86 \$0.13 \$0.03 \$(\$50,172.77) 2035 100.799795 90.4265313 2036 902 0.02 90.444.25 1.63 \$121,053.86 \$0.13 \$0.03 \$(\$50,072.77) 2035 100.799795 90.4265313 2036 902 0.02 92,444.25 1.63 \$121,053.86 \$0.13 \$0.03 \$(\$50,072.77) 2037 102.533551 90.4301671 2037 902 0.02 94,034.29 1.63 \$121,053.86 \$4,800 \$(\$50,000) \$0.13 \$0.03 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$(\$50,000) \$0.13 \$0.03 \$0.03 \$(\$50,000) \$0.13 \$0.03	2032	902	9.02	86,348,44	1.63	\$100,878.22		8,000	(\$16,000.00)						
2034 902 0.02 89,344.37 1.63 \$121,053.86 \$0.43 \$0.03 \$0.03 \$0.072.771 2035 100.799765 90.4285313 2035 902 0.02 90,881.09 1.63 \$121,053.86 \$0.13 \$0.03	2033	902	0.02	87,833.63	1,63	\$121,053.86	•								
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Needs Program 2009

Test	NPV	Benefit/Cost Ratio
Total Resource	\$637,819.69	11.21
Participant	\$912,193.31	29.31
RIM	\$453,713.99	2.84
Utility	\$687,914.55	21.64
Societal	\$1,119,648,68	8.79

Kentucky Power Company High Efficiency Heat Pump Program

Year .	1	2	3	Combined
Equipment Cost (\$)	100,000	200,000	200,000	500,000
Annual Energy Savings (kWh)	251,700	503,400	503,400	1,258,500
Peak Reduction (summer) kW	11.75	11.75	11.75	35
Peak Reduction (winter) kW	167.2	167.2	167.2	502
Incentive (\$)	45,000	90,000	90,000	225,000
Admin (\$)	8,000	15,000	15,000	38,000
PV Avoided costs	263,596	560,666	596,167	1,420,429
PV Lost Revenues	126,033	252,066	252,066	630,164
PV Bill Savings	148,244	296,489	296,489	741,222
w.n.o	•	• • •		
TRC	2.44	2.61	2.77	2.64
RIM	1.47	1.57	1.67	1.59
Utility	4.97	5.34	5.68	5.40
Participant	1.93	1.93	1.93	1.93
Payback (yrs)	3,4	3.4	3.4	3.4

Kentucky Power Company High Efficiency Heat Pump Program

High Efficiency	Lines De	man Calass	latian t	Caracdalasas
HIGH Efficiency	neat ru	IIID CBICU	iation (Spreausneet

Program Energy Savings & Demand Reduction Per Participant			Market Street	
Upgraded Electric Resistance Heating System to High Efficiency Heat Pump		公司的特殊的	**************************************	
Energy Savings Per Year (kWh)	4,176		William Control of the State of	CERTIFICATION CONTRACTOR
Demand Reduction @ System Winter Peak (kW)	2.900			
Demand Reduction @ System Summer Peak (kW)	0.000	77 TE 288		
Upgrade Heat Pump System to Ultra-High Efficiency Heat Pump				
Energy Savings Per Year (kWh)	858	Daily comments of	766002F465V53	NOMES DE L'ARREST DE L'ARREST DE
Demand Reduction @ System Winter Peak (kW)	0,444			Constant of Constant Constant
Demand Reduction @ System Summer Peak (kW)	0.235		42 E 20 E	
Annual Expected Program Energy Savings & Demand Reduction Per Year/Projected Total	Year 1	Year 2	Year 3	Projected Total
Number of Participants Replacement of Resistance Heating System	50	100	100	250
Energy Savings (kWh) = No. Participants x 4,176 kWh/Participant x 1.05 (T&D Losses) x .90 (10% Free Riders)	199 MWh	398 MWh	398 MWh	995 MWh
Winter Demand Reduction (kW) = No. Participants x 2.90 kW/Participant x 1.12 (T&D Losses) x .90 (10% Free Riders)	148 kW	292 kW	292 kW	730 kW
Number of Participants Replacement Heat Pump System	50	100	100	250
Energy Savings (kWh) = No. Participants x 858 kWh/Participant x 1.06 (F&D Losses) x .70 (30% Free Riders)	32 MWh	64 MWh	64 MWh	160 MWh
Winter Demand Reduction (kW) = No. Participants x 0.444 kW/Participant x 1.12 (T&D Losses) x .70 (30% Free Riders)	17 kW	35 kW	35 kW	67 kW
Summer Demand Reduction (kW) = No. Participants x 0.235 kW/Participant x 1.12 (T&D Losses) x .76 (30% Free Riders)	9 kW	18 kW	18 kW	45 kW
Total Number of Participants	100	200	200	500
Energy Savings (kWh) for No. Participants of Replacement Resistance Heating System + Replacement Heat Pump System	231 MWh	462 MWh	462 MWh	1,155 MWh*
Winter Demand Reduction (kW) for No. Participants of Replacement Resistance Heating System + Replacement Heat Pump System	163 kW	327 kW	327 kW	818 kW*
Summer Demand Reduction (kW) for No. Participants of Replacement Resistance Heating System + Replacement Heat Pump System	9 kW	1B kVV	18 kW	45 kW*
* Round Off for Projected Total Energy Savings and Demand Reduction				
10. · · · · · · · · · · · · · · · · · · ·	网络阿拉斯斯 斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯	计设计机关程	等级制造	
Total Program Costs:	Promotion	Evaluation	Program Incentives	Total Costs
Year 1	\$8.000		\$45,000	\$53,000

58 000

\$8,000

\$7,000

\$7,000

500,000

\$90,000

5105 000 \$105,000

Year 2

Year 3

- Assumptions:

 1) Upgraded Electric Resistance Heating System to High Efficiency Heat Pump Receives only Heating Energy Savings & Winter Demand Reduction

 2) Energy T&D Losses @ 106 and Peak Demand T&D Losses @ 1.12

 3) Free Riders estimated at 10% for Upgraded Electric Resistance Heating System to HP and 30% for Upgraded HP System to Ultra-High HP

 4) HSPF 7 7 and SEER 13 for High Efficiency Heat Pump; HSFP 8 2 and SEER 14 for Ultra-High Efficiency Heat Pump

- 5.) Winter Indoor Temperature @ 70°F and Outdoor Temperature 10°F; Summer Indoor Temperature @ 75°F and Outdoor Temperature
- 6) Heating Degree Days ("F-days) @ HDD = 4,555 and Cooling Degree Days ("F-days) @ CDD = 1 033 for Ashland Weather Station 7) Design Heat Loss (HL) @ 44.256 Btu/h; Design Heat Gain (HG) @ 25.769 Btu/h
- 8) Cd empirical factor @ .62 for solar and internal gains
- 9.) Winter Season October April (5,088 hours); Summer Season May September (3 672 hours) 10) Winter Load Factor = 282; Summer Load Factor = 254

Calculation Formulas:

Electric Central Furnace Heating Energy; Eh = (24 hrs /da. x HL Btu/h x HDD *F-days x Cd)/((Ti - To) *F x 3 413 Btu/kWh) Heat Pump System Heating Energy: Eh = (24 hrs./da. x Ht. Btu/h x HDD °F-days)/((Ti - To) °F x 1000 watts/kWh x HSPF) Heat Pump System Cooling Energy: Ec = (24 hrs./da x HG Blu/h x CDD *F-days)/((To - Ti) *F x 1000 watts/kWh x SEER)
Winter Demand Reduction: Dw = (Heating Energy Savings)/(Winter Load Factor x Hours of Winter Season) Summer Demand Reduction: Dc = (Cooling Energy Savings)/(Summer Load Factor x Hours of Summer Season)

Example: Annual Energy Heating Savings to Replace Electric Central Furnace with High Efficiency Heat Pump Annual Heating Energy for Electric Central Furnace: Eh = (24 hrs./da, X 44.256 Btu/h x 4.555 °F-days x 0.62//((70 - 10) °F x 3.413 Btu/kWh) = 14,648 kWh Annual Heating Energy for High Efficiency Heat Pump: Eh = (24 hrs./da X 44.256 Blu/h x 4.555 °F-days)/(70 - 10) °F x 1.000 Watts/kWh x 7 7 HSPF) = 10.472 kWh Annual Heating Savings: Eh (Electric Central Furnace) - Eh (High Efficiency Heat Pump) = 14.648 kWh - 10.472 kWh = 4,176 kWh Winter Demand Reduction: Dw = 4.176 kWh/(.263 x 5.088 hrs.) = 2.90 kW

- 1) Heat Pump Manual, Electric Power Research Institute, TR-109222 November 1997
 2) Manual J Seventh Edition, Residential Load Calculation. Air Conditioning Contractors of America. Copyright 1986
 3) KPCo Mobile Home New Construction Program, August 2005
 4) KPCo High Efficiency Heat Pump Program. August 1997

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KPCo Case No. 2008-00349 Commission Staff First Set of Data Request Order Dated October 13, 2008 Item No. 5 Page 1 of 1

Kentucky Power Company

REQUEST

Previously, Kentucky Power offered a High Efficiency Heat Pump program which was discontinued December 31, 2001. Explain fully the difference between the currently proposed High Efficiency Heat Pump program and the program that was discontinued. Explain Kentucky Power's rationale for reintroducing a program that was previously in place and subsequently discontinued.

RESPONSE

The efficiency guidelines for customers replacing their existing heating system (resistant or heat pump) with a high efficiency heating system have been upgraded to a 13.0 S.E.E.R. and 7.7 H.S.P.F. and a 14.0 S.E.E.R. and 8.2 H.S.P.F., respectively. The previous efficiency guidelines were 11.0 S.E.E.R. and 7.2 H.S.P.F. for a split system and 10.0 S.E.E.R. and 6.8 H.S.P.F. for a package system heat pump. The proposed customer incentive has been increased from \$200 to \$400.

The DSM Collaborative's decision to reintroduce the High Efficiency Heat Pump program at site built-homes was based on the increased number of customer inquires concerning incentives for high efficiency heat pump installations at site built-homes and HVAC dealer support for the reintroduction of this program along with the spiraling upward cost of the high efficiency HVAC equipment.

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Kentucky Power Company

REQUEST

Provide the assumptions, calculations, schedules or other work papers used to derive the annual budgets for each of the three proposed programs.

RESPONSE

High Efficiency Heat Pump Program

Page 3 of this response shows the proposed budget for the program incentives, promotion costs and evaluation costs. The customer incentive for installing a high efficiency heat pump is \$400 and the HVAC dealer incentive is \$50 for each heat pump installed. The budgeted amount for the program incentives is obtained by multiplying the projected annual participants (100 for Year 1 and 200 for Years 2 and 3) by \$450. The annual promotion cost is \$8,000 for co-op advertising and the projected \$7,000 evaluation cost for the 2nd and 3rd year of the program is based on the cost of similar type evaluations.

Energy Education for Students Program

Pages 4 is a spreadsheet showing the proposed budget for program development and administration, promotion cost, educational workshops, compact fluorescent lamps (CFL's) and evaluation costs. Pages 5 and 6 support the development and administration cost obtained from the NEED Project quote. The projected promotion cost is \$1,000 annually. This cost is for sending program introduction letters to the superintendent, principal and 7th grade teacher at middle schools within our service territory. During the 2nd and 3rd year reminder letters will be sent to participating schools and program introduction letters will be sent to middle schools who elected not to participate in the previous year. Pages 5 and 6 support the cost of the educational workshops composed of the \$3,000 NEED In-service cost. The cost for the meeting location and food costs will be the responsibility of Kentucky Power Company. Page 7 shows the cost of the 4-pack of 23 watt CFL's as shown on the attached quote from AM Conservation (rounded to the nearest dollar). The evaluation cost is based on similar type program evaluations.

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Community Outreach Compact Fluorescent Lighting (CFL) Program

Page 8 of this response is the proposed budget consisting of CFL costs, promotion costs, administration costs and evaluation costs. The cost of the CFL's is obtained by multiplying the number of projected annual participants by \$10 (projected cost of the 4-pack of 23 watt CFL's per quote). The projected promotion cost is for local newspaper advertising for the CFL giveaways. The administration cost is for maintaining the program participant database. The evaluation cost for the 2nd and 3rd year is based on similar type evaluations.

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Kentucky Power Company High Efficiency Heat Pump Program Projected Budget 2009 - 2011

Annual Budget	2009	2010	2011
Number of Participants	100	200	200
Amount of Each Incentives	\$450	\$450	\$450
Total Projected Program Incentives (\$400 customer Incentive, \$50 HVAC Dealer Incentive for each H/P Sold)	\$45,000	\$90,000	\$90,000
Projected Promotional Costs (Co-op Advertising)	\$8,000	\$8,000	\$8,000
Projected Evaluation Costs per Load Research based on similar type program evaluations.	\$0	\$7,000	\$7,000
Total	\$53,000	\$105,000	\$105,000

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Kentucky Power Company Energy Education for Students Program Projected Budget 2009 - 2011

Annual Budget	2009	2010	2011
Program Development & Administration per Quote NEED Project dated 4/18/08	\$4,000	\$3,000	\$3,000
Projected Promotional Costs (Program Introduction Letters to Superintendants and Middle School Principals)	\$1,000	\$1,000	\$1,000
NEED In-Service Workshops per Quote NEED Project dated 4/18/08	\$3,000	\$3,000	\$3,000
Projected Meeting Location / Food Costs For In-Service Workshops	\$2,000	\$2,000	\$2,000
Projected Costs Compact Fluorescent Lamps per Quote AM Conservation including shipping rounded to nearest dollar. (\$10.00) (Year one 1,200 students and years two and three 1,700 students)	\$12,000	\$17,000	\$20,000
Projected Evaluation Costs per Load Research based on similar type programs evaluations	<u>\$0</u>	<u>\$5,000</u>	<u>\$5,000</u>
Total	\$22,000	\$31,000	\$34,000

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<u>Kentucky Power DSM Proposal</u> <u>Submitted by The NEED Project – April 18, 2008</u>

TERMS

Year one of the program will launch in January 2009 and be completed by December 31, 2009. Subsequent years will follow the same schedule. NEED will facilitate the design and delivery for the program, working with Kentucky Power to contact school administrators and teachers in the Kentucky Power service territory to promote and implement the CFL project. The target audience will be seventh grade students across the KP/AEP service territory, with an estimated first year distribution of 1200 CFL's. This number may be adjusted after completion of the year one project evaluation. Three, three hour in-services will be scheduled for Ashland, Pikeville and Hazard. Kentucky NEED currently facilitates 6-hour workshops in Eastern KY and will leverage sponsor funds to strengthen the program for K-12 teachers and students.

PAYMENT TERMS

NEED and Kentucky Power will create a payment schedule acceptable to each entity.

BUDGET

Budget - Year One*

Program Development and Administration

\$4,000.00

Includes staff time, staff travel, and program expansion activities, meetings with school administrators, data collection and evaluation

NEED In-services \$3,000.00

Three Professional Development at \$1,000/each Includes NEED energy education materials

TOTAL \$7.000.00

*NOTE: Kentucky Power is purchasing the CFL's and covering the cost of shipping. They are also covering the cost of the meeting space and food for the professional development workshops.

Budget - Year Two

Program Development and Administration

\$3,000.00

Includes staff time, staff travel, and program expansion activities, meetings with school administrators, data collection and evaluation

NEED In-services \$3,000,00

Three Professional Development at \$1,000/each Includes NEED energy education materials

TOTAL \$6,000.00

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Budget - Year Three

Program Development and Administration

\$3,000.00

Includes staff time, staff travel, and program expansion activities, meetings with school administrators, data collection and evaluation

NEED In-services \$3,000.00

Three Professional Development at \$1,000/each Includes NEED energy education materials

TOTAL \$6,000.00

TIMETABLE

January - February 2009

Meetings with superintendents in districts in Kentucky Power service territory.

February - March 2009

Schedule and Facilitate Professional Development Workshops

March - May 2009

Implement project - deliver CFL's

June 2009

Evaluate current status of delivery of CFL's. Determine what, if any actions need to be taken for the fall.

December 2009

Final report due.

<u>Timetable for years 2 & 3</u>

Annual timetable would remain the same unless both parties agree on any recommended changes.

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AM CONSERVATION— GROUP, INC.

SALES DEPARTMENT QUOTATION



					-
2301 CHARLESTON REGIONAL PARKWAY CHARLESTON, SC 29492 Phone: 1-843-971-1414 Fax: 1-843-971-1472 E-Mail: amcg@nac.net				10/13/2008	
CONFAST NAME	Kentucky Power				
	Don Music				
	Don Music 606-929-1540	6D6-929-1441	WEAR CHIEF		
ECK-400	4 Pack 23 Watt Spirals (AM	234) individually packed in a 4	pack.	\$9.29/per pac	k
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	800-GOOD-BUY or 80	0-777-5655 xt. 19	843-	971-1472	į

Thank you for calling AM Conservation Group, Inc. for pricing. We welcome the opportunity to provide you with quality material and superior service.

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Kentucky Power Company Community Outreach Compact Fluorescent Lighting (CFL) Program Projected Budget 2009 - 2011

Annual Budget	2009	2010	2011
Projected Costs CFL's per Quote AM Conservation including shipping rounded to nearest dollar. (\$10 per participant) (Year one 3,500 participants and years two and three 4,000 participants)	\$35,000	\$40,000	\$40,000
Projected Promotional Costs for Newspaper Advertising	\$3,200	\$3,900	\$4,000
Projected Administrative Costs For Maintaining Participant Database	\$2,000	\$2,000	\$2,000
Projected Evaluation Costs per Load Research based on similar type program evaluations.	<u> </u>	\$8,000	\$8,000
Total	\$40,200	\$53,900	\$54,000

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

COMMONWEALTH OF KENTUCKY

CASE NO. 2008-00349

COUNTY OF FRANKLIN

AFFIDAVIT

Errol K. Wagner, upon first being duly sworn, hereby makes oath that if the foregoing questions were propounded to him at a hearing before the Public Service Commission of Kentucky, he would give the answers recorded following each of said questions and that said answers are true.

Subscribed and sworn before me by Errol K. Wagner this 23'day of October, 2008.

Notary/Public

My Commission Expires / AMURY 14, 2009