Frost Brown Todd LLC
ATTORNEYS

Mark David Goss
Member
859.244.3232
mgoss@fbtlaw.com

February 1, 2011

RECEIVED
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PUBLIC SERVICE COMMISSION

Mr. Jeffrey Derouen
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
P. O. Box 615
Frankfort, Kentucky 40602-0615

Re: PSC Case No. 2010-00238
In the Matter of: An Investigation of East Kentucky Power Cooperative, Inc.'s Need for the Smith 1 Generating Facility

Dear Mr. Derouen:

Please find enclosed for filing with the Commission in the above-referenced case, an original and ten copies of the responses of East Kentucky Power Cooperative, Inc. to the Commission Staff's Supplemental Information Request, dated January 21, 2011.

Very truly yours,

Mark David Goss

Enclosures

cc: Parties of Record

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

AN INVESTIGATION OF EAST KENTUCKY POWER COOPERATIVE, INC.'S NEED FOR SMITH 1 GENERATING FACILITY	)))	CASE NO. 2010-00238

RESPONSES TO COMMISSION STAFF'S SUPPLEMENTAL INFORMATION REQUEST TO EAST KENTUCKY POWER COOPERATIVE, INC. DATED JANUARY 21, 2011

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

AN INVESTIGATION OF EAST KENTUCKY POWER COOPERATIVE, INC.'S NEED FOR SMITH 1 GENERATING FACILITY	)))	**CASE NO. 2010-00238**

CERTIFICATE

STATE OF KENTUCKY)
)
COUNTY OF CLARK)

Michael A. McNalley, being duly sworn, states that he has supervised the preparation of the responses of East Kentucky Power Cooperative, Inc. to the Public Service Commission Staff's Supplemental Information Request in the above-referenced case dated January 21, 2011, and that the matters and things set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

Subscribed and sworn before me on this 31 day of January, 2011.

Notary Public

MY COMMISSION EXPIRES NOVEMBER 30, 2013
NOTARY ID #409352

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

AN INVESTIGATION OF EAST KENTUCKY POWER COOPERATIVE, INC.'S NEED FOR SMITH 1 GENERATING FACILITY	)))	**CASE NO. 2010-00238**

CERTIFICATE

STATE OF KENTUCKY)
)
COUNTY OF CLARK)

Julia J. Tucker, being duly sworn, states that she has supervised the preparation of the responses of East Kentucky Power Cooperative, Inc. to the Public Service Commission Staff's Supplemental Information Request in the above-referenced case dated January 21, 2011, and that the matters and things set forth therein are true and accurate to the best of her knowledge, information and belief, formed after reasonable inquiry.

Julia J. Tucker

Subscribed and sworn before me on this 31 day of January, 2011.

Lynn M. Williams
Notary Public

MY COMMISSION EXPIRES NOVEMBER 30, 2013
NOTARY ID #409352

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2010-00238
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION STAFF SUPPLEMENTAL INFORMATION REQUEST DATED JANUARY 21, 2011
REQUEST 1
RESPONSIBLE PERSON: **Julia J. Tucker**
COMPANY: **East Kentucky Power Cooperative, Inc.**

Request 1. Refer to the response to Item 6 of the Commission Staff's Initial Request for Information ("Staff's First Request") in this case. The response includes five pages with the fifth page being identified as "Revision to page 9 of Tucker Testimony." The page ends with an incomplete sentence at the bottom of the page. Provide a new page 5, or a page 6, if necessary, which includes the remainder of the response.

Response 1. Please see pages 2 and 3 of this response.

Existing programs include:

Electric Thermal Storage Incentive Program

- Tune-Up HVAC Maintenance Program
- Button-up Weatherization Program
- Touchstone Energy Home Program
- Touchstone Energy Manufactured Home Program
- Compact Fluorescent Lighting Program
- Commercial Advanced Lighting
- Interruptible rates for industrial customers
- Industrial Compressed Air

New Programs include:

- Button-up Weatherization with Air Sealing Program
- Air Source Heat Pump replacing resistance heat
- Dual Fuel
- Direct Load Control of Air Conditioners and Water Heaters

Estimated demand and energy impacts as well as descriptions of the programs are shown on Exhibit JJT-3. The net total winter peak demand impact grows from 141 MW in 2010 to over 220 MW at the end of the 20 year period.

Q. Will you please describe EKPC's production costing model?

A. The primary model used in developing the production costs for each of the evaluated scenarios was RTSim from Simtec, Inc., of Madison, WI. The RTSim production cost model calculates the hour-by-hour operation of the generation system including unit hourly generation, commitment, power purchases and sales, including economy and day

ahead transactions, and daily and monthly options. Generating unit input includes expected operating characteristics, Monte Carlo forced outages, unit ramp rates, and unit startup characteristics. The RTSim model uses a Monte Carlo simulation to capture the statistical variations of unit forced outages and deratings. The production cost model is simulating the actual operation of the power system in supplying the projected customer loads using the assumptions.

Input assumptions for the load are based on the information described in Exhibit JJT-1. Fuel, emission, variable O & M, purchase and sales costs are listed in Exhibit JJT-5. Also shown by unit in Exhibit JJT-5 is heat rate and unit availability data.

Q. Describe each case evaluated/modeled.

A. Case 1: Smith 1 as planned (2014 completion) – Base Case

Case 2: Delay Smith 1 for 2 years (2016 completion)

Case 3: Delay Smith 1 for 4 years (2018 completion)

Case 4: Cancel Smith 1, build a combined cycle unit in the optimal time frame

Case 5: Cancel Smith 1, provide all future power supply needs with a combination of increased DSM efforts and renewable generation resources

Case 6: Cancel Smith 1, depend on Purchased Power until 2022 then construct combined cycle generation

Case 7: Cancel Smith 1, sell the equipment to an entity constructing a similar plant and enter into a long term purchase agreement with same entity

See Exhibit JJT-4 for the capacity expansion plan for each case.

Q. In Case 3, why is EKPC using a four-year delay assumption versus a five-year delay?

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2010-00238
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION STAFF SUPPLEMENTAL INFORMATION REQUEST DATED JANUARY 21, 2011

REQUEST 2

RESPONSIBLE PERSON: **Julia J. Tucker**

COMPANY: **East Kentucky Power Cooperative, Inc.**

Request 2. Refer to the response to Item 6.a. of Staff's First Request.

a. Describe the standards, tests, etc. used by EKPC to qualitatively measure customer acceptance of potential demand-side management programs.

b. Identify which of the standard (California) tests were used to determine the cost-effectiveness of each program.

Response 2a. Please see pages 2 through 7 of this response for a description of the qualitative screening process. These pages are included in the Technical Appendix to EKPC's 2009 Integrated Resource Plan ("IRP") [Case No. 2009-00106.]

Response 2b. Please see pages 8 through 13 of this response for a description of the quantitative evaluation process. These pages are included in the Technical Appendix to EKPC's 2009 IRP.

Qualitative Screening Process

Next, EKPC developed the criteria it would use to screen these 103 measures. The four criteria chosen capture the major considerations as to whether a measure is suitable for robust quantitative analysis. The criteria consider the customer, the measure itself, the savings, and the economics. Each potential DSM measure was evaluated based on a scale of 1 to 5 against each of the four criteria.

The four criteria and a description of each are shown as Exhibit DSM-1 page 6.

Qualitative Screening criteria

Scoring system: 1 – 5 , where 1 means POOR and 5 means EXCELLENT

CRITERIA	COMMENTS/EXAMPLES
1. Customer Acceptance	What will the response of customers be to the offer to participate in the program or to install the measure(s) in their facilities? POOR = measures that reduce the quality of the energy service equipment, are excessively difficult to install, or might interfere with vital activities in the establishment (home, business, industrial plant). Example: Retailer would be unlikely to put in window shades to reduce cooling loads because they want the product displays to be visible.
2. Measure Applicability	Have the efficiency gains been superseded by standards or code requirements? Example: SEER 12 central air conditioners are no longer an efficiency measure because Federal appliance efficiency standards require a minimum SEER of 13. Is the measure commercially available today? Measures that are still in the R&D stage or that are no longer manufactured would score low on this criteria. Will the measure save energy or demand in the EKPC climate? Is the measure a good fit for the DSM objectives that EKPC has? Is there a better measure available for the same end-use application? Example: Triple glazed windows versus low e double pane window.
3. Savings Potential	How substantial are the savings likely to be? How measurable or quantifiable are the savings? Is the measure technically reliable such that savings are assured? Is the marketplace capturing the savings already without a utility program? POOR = Savings are small or not easily quantified
4. Cost Effectiveness	Given typical savings, typical measure costs, and a conservative (high) estimate of future avoided energy and capacity costs, how cost effective is this program likely to be using the Total Resource Cost test? POOR = clearly below 1 (say 0.3 on the TRC using a high estimate of future avoided costs) EXCELLENT = clearly above 1 (say 3-5 or higher on the TRC)

Qualitative Screening Results

The results of the qualitative screening process are presented in Exhibit DSM-1 as well as in Table DSM-3 below. DSM measures which received a combined score of 15 or higher were passed on to the next phase, the Quantitative Evaluation Process. These measures which passed the screening are in **bold** in Exhibit DSM-2 pages 8-10.

Table DSM 3
Results of Qualitative Screening

Class	Original # of Measures	# that PASSED Qualitative Screen
Residential	46	15
Commercial/Industrial	57	18
TOTAL	103	33

As the table shows, 33 DSM measures passed qualitative screening. These 33 options were then evaluated in the quantitative evaluation process.

Exhibit DSM-2
Page 1 of 3

Complete List of DSM Measures & Results of Qualitative Screen
Measures that passed the Qualitative Screen are IN BOLD

Residential

1	**Residential Efficient Lighting**
2	**Direct Load Control - air conditioners & water heaters**
3	**Programmable thermostats with electric furnace heat**
4	**ENERGY STAR Refrigerator**
5	**ENERGY STAR Room Air Conditioner**
6	**ENERGY STAR Clothes Washers**
7	Cold climate heat pump
8	**Heat retrofit/ early replace: resistance to heat pump**
9	Inefficient heat pump to geothermal early replacement
10	SEER 10 heat pump to SEER 15 early replacement
11	Ductless mini-split heat pump
12	Inefficient Central Air Conditioner to SEER 15
13	High efficiency furnace fan motors
14	**Low income weatherization**
15	**Enhanced Button-Up (air sealing)**
16	**Enhanced Tune-Up (duct sealing)**
17	**Enhanced Touchstone Home (thermal sealing/bypass)**
18	Ceiling Fans
19	Multi-family program
20	**Mobile home retrofit program**
21	Polarized Refrigerant oxidant agent
22	**ENERGY STAR Central Air Conditioner**
23	Low flow showerhead with faucet aerator/pipe insulation
24	Heat pump water heater
25	Instantaneous water heater
26	Solar water heater
27	Room AC exchange & recycle program
28	ENERGY STAR Dishwashers
29	Refrigerator/Freezer Recycling
30	Remove old second refrigerators
31	Removed old second freezers
32	ENERGY STAR Freezers
33	ENERGY STAR Home electronics
34	ENERGY STAR Windows
35	ENERGY STAR Dehumidifiers
36	Heat pump dryer
37	Efficient pool pump
38	Well water pump
39	High efficiency outdoor lighting
40	LED lighting
41	**Direct load control - pool pump**
42	**Time of use rates**
43	Inclining block rates
44	Passive Solar (new construction)
45	Photovoltaics (customer sited)
46	Wind turbine (customer sited)

Commercial

1	**Commercial HVAC**
2	**Demand Response**
3	**Commercial Building Performance**
4	**Commercial New Construction**
5	**Efficient refrigeration equipment**
6	**Small C&I audit program**
7	Building operator certification program
8	**Geothermal heat pump**
9	Evaporative cooling
10	Advanced ventilation
11	High efficiency HVAC motors
12	**Early replacement inefficient unitary/split system HVAC**
13	Cool roof program
14	High performance glazings
15	**Duct sealing**
16	Thermal energy storage
17	Heat pump water heaters
18	Drain heat recovery water heaters
19	**LED exit signs**
20	**Advanced lighting program**
21	Efficient cooking equipment
22	Efficient clothes washers
23	**ENERGY STAR Vending machines**
24	Energy Management Systems
25	DLC of irrigation pumps
26	**DLC of central air conditioners**
27	**Energy efficient schools**
28	Farms program: fans, pumps, irrigation
29	Time of use rates
30	Combined heat & power
31	Stand-by generation program
32	Daylighting
33	Solar hot water
34	Photovoltaics
35	Wind turbine

Industrial/Other

1	**Motors**
2	**Variable speed drives**
3	**Demand Response**
4	**Compressed air**
5	Industrial process
6	Process cooling
7	Refrigerated Warehouse
8	High efficiency transformers
9	Automotive and transportation sector equipment
10	Livestock, equine, poultry and meat processing sector
11	Chemicals sector
12	Machinery/machine tools sector
13	Aluminum sector
14	Plastics sector
15	Computer and electronics sector
16	Combined heat and power
17	Other onsite generation (conventional)
18	Photovoltaics
19	Wind turbine
20	LED Traffic signals
21	Water/Wastewater Treatment facilities
22	Conservation Voltage Reduction

Quantitative Evaluation Process

The 33 measures that passed the qualitative screening process were next transformed into DSM programs. Some programs consist of more than one measure, and a few do not lend themselves to quantitative analysis. As a result, 25 DSM programs were prepared for the Quantitative Evaluation.

EKPC uses the EPRI *DSManager* software package to conduct the more detailed quantitative evaluation. *DSManager* calculates the impact of DSM programs on utilities and their customers. The software tracks both the physical changes, such as the level of power demand, and the dollar flows. *DSManager* produces a quantitative estimate of the costs and benefits for each of the parties using simplified but powerful and flexible models of the electric system and its customers.

The relationships are straightforward. DSM programs change the way customers use energy. *DSManager* traces these changes through the energy system to determine, for example, how the amount of electricity generated changes over time. Using input values which describe how these changes impact costs and detailed descriptions of the costs and rates (prices) for energy, *DSManager* translates these physical measures into dollars, and ultimately into costs and benefits.

DSManager determines the cost-effectiveness of DSM programs by reporting results according to the cost-benefit tests established in the California Standard Practice Manual for Economic Analysis of Demand Side Programs[3].

EKPC uses these tests to examine cost-effectiveness from three major perspectives: participant cost (PC), ratepayer impact measure (RIM), and total resource cost (TRC). A fourth perspective, the societal cost (SC), is treated as a variation on the TRC test. The results of each perspective can be expressed in a variety of ways, but in all cases, it is necessary to calculate the net present value of program impacts over the life cycle of those impacts. *DSManager* uses this information to calculate the benefit/cost (b/c) ratio for each of these four tests.

These tests are not intended to be used individually or in isolation. The results of tests that measure efficiency, such as the TRC and the SC, must be compared not only to each other, but also to the RIM test. This multi-perspective approach will require reviewers to consider tradeoffs between the various tests.

EKPC is a full requirements Generation and Transmission provider for its 16 member cooperatives. Each cooperative is an independent non-profit corporation and operates distinct from EKPC. As a result, it is necessary to examine the impacts of DSM programs separately for EKPC and for the typical distribution cooperative. *DSManager* has the functionality to enable the user to separately report the RIM test for EKPC and for the distribution cooperative.

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[3] California Public Utilities Commission and California Energy Commission, "Standard Practice Manual for Economic Analysis of Demand-Side Management Programs," Document Number P400-87-006, December 1987.

Time is a critical element in DSM analysis. It is important to represent time within a year and over a period of many years. *DSManager* divides the year into seasons and representative days. These days are usually related to weather and to patterns of human activity. EKPC has selected 48 representative days to model the calendar year, four for each month. Each day is modeled using 24 hourly loads. This is true both for the utility system, individual end-uses, and DSM program impacts.

The daytypes are: High Weekday, Medium Weekday, Low Weekday, and Weekend. High, medium, and low refer to the EKPC system loads.

Each of the 25 DSM programs was modeled in detail with *DSManager*. The model includes for each DSM program:

- 48-daytype hourly load profiles for targeted end-uses with and without the program
- Lifetime of the measure savings
- Incremental measure costs (participant costs)
- EKPC and distribution cooperative administrative costs
- Rebates to customers, and from EKPC to the cooperative
- Detailed retail and wholesale rate schedules
- Customer participation levels

In addition to the detailed modeling of the DSM programs, *DSManager* also includes a detailed model of the supply side costs. Major categories of supply side costs that are accounted for by the model include:

- Marginal energy costs (by year, daytype, and hour)
- Marginal generation capacity costs (by category and year, including seasonal allocation)
- Marginal transmission & distribution capacity costs (by year, incl. seasonal allocation)
- Fossil fuel (natural gas & propane) costs (by year)
- Environmental externality costs (costs not internalized in energy or capacity costs; chiefly carbon related)

Exhibit DSM-3 beginning on page DSM-20 provides assumptions sheets for each of the twenty-five new DSM programs that were evaluated.

Quantitative Screening Results

DSManager calculates the net present value of the costs and benefits of each DSM program and presents the results in terms of the California Tests. Detailed results of the Quantitative Screening can be found in Exhibit DSM-4 beginning on page DSM-46 which contains summary sheets for each of the twenty-five new DSM programs.

The following table summarizes the results:

Table DSM 4
Results of Quantitative Screening

	Total	TRC > 1.0	PC>1.0	Coop RIM>1.0	EKPC RIM > 1.0
New Residential	14	13	14	3	7
New Commercial/ Industrial	11	10	11	2	1
TOTAL	25	23	25	5	8

As this table shows, the results for the cost-effectiveness tests were generally favorable for the DSM programs. Of the 25 DSM Programs that were evaluated, 23 produced a Total Resource Cost test benefit-cost ratio of greater than 1.0.

Exhibit DSM-5 beginning on page 71 provides program descriptions for each of the existing programs, while Exhibit DSM-6 beginning on page 87 provides program descriptions for each of the new programs.

Recommendations

As a result of the favorable cost-effectiveness results from the Quantitative Screening, the 23 out of 25 new DSM programs that passed the Total Resource Cost test were considered in the integrated analysis portion of the IRP. The integrated analysis determines the direction that EKPC should take in meeting the future needs of its member cooperatives and their customers.

EKPC presents the following DSM Program Portfolio for the 2009 Integrated Resource Plan:

Table DSM 5
Existing Programs

Program Name	Class	Winter Peak Demand Impact in 2009 (MW)[4]	Summer Peak Demand Impact in 2009 (MW)	Annual Energy Impact in 2009 (MWh)
Electric Thermal Storage	Residential	-25.3	0.0	43,402
Electric Water Heater	Residential	0.1	0.1	591
Geothermal Heating & Cooling	Residential	-19.7	-4.2	-9,704
Air Source Heat Pump	Residential	13.4	-1.5	4,947
Tune-Up HVAC Maintenance	Residential	-3.3	-1.3	-4,382
Button-Up Weatherization	Residential	-17.9	-6.9	-23,504
Touchstone Energy (TSE) Home	Residential	-2.2	-0.5	-2,004
TSE Manufactured Home	Residential	-0.1	0.0	-129
Compact Fluorescent Lighting	Residential	-4.1	-2.9	-25,883
Gallatin Steel Interruptible	Industrial	-120.0	-120.0	0
Other Interruptible	Industrial	-8.0	-8.0	0

[4] Negative value means a reduction in load requirements

Table DSM 6
New Programs

Program Name	Class	Peak Demand Savings in 2018 (MW)[5]	Total Resource Cost Test Benefit/ Cost Ratio	Participant Test Benefit/ Cost Ratio
Direct Load Control for Air Conditioners and Water Heaters	Residential	-15.3	2.34	Infinite
Residential Efficient Lighting	Residential	-21.5	7.67	13.02
ENERGY STAR Clothes Washer	Residential	-1.4	1.76	1.83
ENERGY STAR Room Air Conditioner	Residential	0.0	1.72	1.29
ENERGY STAR Refrigerator	Residential	-0.3	1.63	2.49
Programmable Thermostat with Electric Furnace Retrofit	Residential	0.0	4.97	7.95
Enhanced TSE Home	Residential	-26.5	2.08	1.57
Replace Furnace with Heat Pump	Residential	0.0	1.59	1.92
Low Income Weatherization	Residential	-27.0	1.54	Infinite
Home Performance with ENERGY STAR	Residential	-36.7	1.96	2.16
Mobile Home Retrofit	Residential	-8.9	1.73	2.23
ENERGY STAR Central Air Conditioner	Residential	0.0	1.67	2.20
DLC for Pool Pumps	Residential	0.0	1.59	Infinite
C&I Demand Response	Commercial	-19.9	3.62	2.62
Commercial Efficient HVAC	Commercial	-0.4	2.42	3.01
Commercial Building Performance	Commercial	-2.0	1.04	2.05
Commercial New Construction	Commercial	-1.4	1.44	1.86
Commercial Efficient Refrigeration	Commercial	-0.5	3.11	5.19
DLC Commercial Central Air	Commercial	0.0	3.30	Infinite
Commercial Advanced Lighting	Commercial	-4.2	2.10	2.91
Industrial Premium Motors	Industrial	-0.5	4.45	5.39
Industrial Variable Speed Drives	Industrial	-3.0	4.24	4.86
Compressed Air	Industrial	-0.6	1.96	3.52

These new programs are projected to produce over $240 million of net benefits (2009 $) on a total resource basis over the lifetime of the cost-effectiveness study (20 years). They will require an investment of just under $175 million (2009 $) by EKPC, its member cooperatives, and participating customers in order to produce these savings.

DSM program design and implementation are complex and dynamic undertakings. It is possible that DSM programs that are selected through this evaluation process may not be implemented as

[5] Negative value means a reduction in load requirements. Coincident with EKPC winter peak.

they have been described in this document. DSM programs that are ultimately launched will first be subjected to a much more rigorous program design effort. In certain cases, a demonstration or pilot project may precede full-scale implementation to test the validity of the program concept. This could mean that certain program concepts are modified, and some may not ultimately be implemented.

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2010-00238
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION STAFF SUPPLEMENTAL INFORMATION REQUEST DATED JANUARY 21, 2011
REQUEST 3
RESPONSIBLE PERSON: **Michael A. McNalley**
COMPANY: **East Kentucky Power Cooperative, Inc.**

Request 3. Refer to the response to Item 17 of Staff's First Request. A final order has been issued in Case No. 2010-00167, which, based on the settlement among the parties to the case, approved a $43 million increase in revenue. Concerning Smith 1, the settlement provided for interest expense of "$6 million plus TIER." Explain whether EKPC has made a final decision concerning how it intends to recover, on a long-term basis, the financing costs related to the regulatory asset for which it seeks approval in Case No. 2010-00449.

Response 3. If the Commission approves the establishment of the regulatory asset in Case No. 2010-00449, EKPC will remove the "$6 million plus TIER," or $9 million, from its base rates approved in Case No. 2010-00167. As part of its Application for recovery of the regulatory asset amortization, EKPC will include a request for recovery of the full long-term financing costs related to the regulatory asset. Additionally, EKPC will submit an Application to the Commission under KRS 278.300 requesting approval of the long-term financing.