a PPL company

Mr. Jeff DeRouen
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601

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PUBLIC SERVICE COMMISSION

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January 6, 2012

RE: ***Request of Louisville Gas and Electric Company to Cancel and Withdraw the Tariffs for Its Responsive Pricing and Smart Metering Pilot Program*** **- Case No. 2011-00440**

Dear Mr. DeRouen:

Enclosed please find and accept for filing an original and six copies of Louisville Gas and Electric Company's Response to the Commission Staff's Initial Request for Information dated December 22, 2011, in the above-referenced matter.

Should you have any questions regarding the enclosed, please do not hesitate to contact me.

Sincerely,

Rick E. Lovekamp

Rick E. Lovekamp

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

REQUEST OF LOUISVILLE GAS AND ELECTRIC COMPANY TO CANCEL AND WITHDRAW THE TARIFFS FOR ITS RESPONSIVE PRICING AND SMART METERING PILOT PROGRAM	))))	CASE NO. 2011-00440

LOUISVILLE GAS AND ELECTRIC COMPANY

RESPONSE TO THE COMMISSION STAFF'S INITIAL REQUEST INFORMATION

DATED DECEMBER 22, 2011

FILED: JANUARY 6, 2012

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Michael E. Hornung**, being duly sworn, deposes and says that he is Manager of Energy Efficiency Planning & Development for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Michael E. Hornung

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 6th day of January 2012.

(SEAL)
Notary Public

My Commission Expires:

July 21, 2015

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 1

Witness: Michael E. Hornung

Q-1. Refer to the 2010 Annual Report in Case No. 2007-00117,[1] filed on April 1, 2011.

a. Page 7 of the July 12, 2007 Order in Case No. 2007-00117 identifies the control group for the pilot as having "varying levels of the same equipment installed but will not be subject to the tariffs proposed under the program." The table at the top of page 10 of the 2010 Annual Report shows the control group as having smart meters but no other equipment. Explain why the control group used in the program's analysis differs from the control group described in the July 12, 2007 Order.

b. Refer to page 20 of the 2010 Annual Report. The third paragraph states, "the temperatures during summer 2010 were significantly warmer than previous years and provided considerable data for evaluation. The results were positive and produced demand savings up to 1 kW per pilot participant."

(1) Explain why LG&E wants to terminate the pilot program even though it produced demand savings up to 1 kW per pilot participant.

(2) Was the demand savings up to 1 kW during LG&E's 2010 peak load? If not, explain.

(3) What was LG&E's estimated peak reduction from all participants during the 2010 peak load?

(4) Has LG&E performed a cost/benefit analysis that compares the dollar impact of the energy savings achieved to the cost of the program? Provide and discuss the analysis.

A-1. a. The group identified as "Control Group" in the table at the top of page 10 of the 2010 Annual Report is one of the four sub-groups of the overall control group specified on Page 7 of the July 12, 2007 Order in Case No. 2007-00117. LG&E used "Control

[1] Case No. 2007-00117, Application of Louisville Gas and Electric Company for an Order Approving a Responsive Pricing and Smart Metering Pilot Program (Ky. PSC July 12, 2007).

Group" in the analysis of the pilot to help assess and compare the program's impact relative to the remaining three sub-groups of the overall control group (i.e., Thermostat and Display Group, Display Only Group, Demand Conservation Group) in addition to the Responsive Pricing group. Therefore, all four subgroups which make up the overall control group and contain varying combinations of identical premise equipment each, as described on Page 7 of the July 12, 2007 Order in Case No. 2007-00117, were included in the program's analysis.

b.

(1) Even though 2010 critical peak pricing (CPP) events demonstrated demand savings up to 1 kW per pilot participant, LG&E found considerable increase in load after the end of CPP period (i.e., up to 0.8 kW) which eliminates any affirmative impact on system load. With only sixty eight customers remaining on the Responsive Pricing rate, LG&E finds that maintaining the program at an estimated annual cost of $240,000 is not economical. Please refer to the answers provided to Question No. 6, Question No. 7, and Question No. 9 for additional explanation.

(2) The 2010 CPP events data demonstrated that demand savings of approximately 1 kW per Responsive Pricing participant occurred at 15:00 only on days when temperatures ranged from 91 to 95 degrees. The 2010 system peak load for LG&E and KU occurred on August 4, 2010 at 15:00 when the temperature in Louisville reached 100 degrees. LG&E did not initiate a CPP event on this day; however LG&E did kick off a CPP event on August 10, 2010 when the temperature conditions were identical to those recorded during peak load on August 4, 2010. On August 10, 2010, LG&E found demand savings which were among the smallest of all 2010 CPP events, amounting to only 0.5 kW per Responsive Pricing participant at 15:00.

(3) The 2010 system peak load for LG&E and KU occurred on August 4, 2010 at 15:00 when the temperature in Louisville reached 100 degrees. Average peak reduction from all program participants during the 2010 peak load weather conditions is estimated to be 0.4 kW per participant at 15:00.

(4) While the intent of the program was to enable participants to maximize their savings through energy usage reduction and time-shifting, data demonstrated that participating customers decreased their energy usage slightly in high- and critical-peak priced periods but used more energy overall in lower-priced off-peak and weekend time periods. LG&E found the program to be very effective in shifting system load, but determined no benefit in energy savings when compared to the cost of the program. The table at the top of page 17 of the 2010 Annual Report shows program cost through year 2010 amounting to $2,033,000. Demonstrated demand savings of up to 1 kW per Responsive Pricing participant do not make up for this expenditure, given that on average only ninety five customers participated on the Responsive Pricing program through year 2010. However, it should be

noted that a larger participant group, developed through wide scale deployment of smart meter network, could generate positive demand savings and consequently sustain large program expenditures.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 2

Witness: Michael E. Hornung

Q-2. Refer to the Responsive Pricing and Smart Metering Pilot Program Final Report filed on July 1, 2011 in Case No. 2007-00117.

a. Refer to page 10 of 16, Section 3.3, Critical Peak Pricing Events. Explain why critical peak pricing events occurred on August 11, 2008, August 12, 2008, and July 28, 2009 when the temperature in degrees on those days was 79, 81, and 82, respectively.

b. Refer to page 10 of 16, Section 3.4, Field Equipment. This paragraph states that, "LG&E has acknowledged the need to evaluate different variations of emerging technologies on a periodic basis." Provide LG&E's plans to perform this evaluation.

c. Refer to page 11 of 16, Section 4.1, Demand Response Impacts.

(1) The second paragraph states that, "Average demand reductions during CPP events varied from 0.2 kWh to over 1.0 kWh per participant during high-temperature periods." Confirm that the kWh references should have been to kW.

(2) The third paragraph states that, "LG&E recognizes that varying the total system load through added communications technologies between the utility and premise equipment may mitigate negative results related to bounce-back." Explain how this could be accomplished.

d. Refer to page 14 of 16, Section 4.4, Revenue Impact. The sentence below the table states that "LG&E believes that recurrent tariff adjustments may be required in order to effectively assess customer adoption and maintain revenue neutrality." Explain what is meant by "recurrent tariff adjustments" and how they would be implemented.

e. Refer to page 14 of 16, Section 5.0, Recommendations. LG&E states in the second paragraph that it "suggests that in order to enhance the customer relationship, a higher level of guidance and direction be provided through additional pilot programs. These additional pilot programs may be completely new programs designed to advance understanding of rate design and impact on customer behavior simultaneously with implementing new technologies." Provide LG&E's plans for future pilot programs.

f. Refer to page 15 of 16, Section 5.0, Recommendations. The second paragraph states that LG&E will maintain the existing meters currently in place.

(1) State whether the meters used in the pilot program are outdated compared with new smart meters on the market today. Explain the differences in capabilities.

(2) State whether any other equipment obtained by the participating customers during the pilot will be returned to LG&E or will stay with the customer.

g. Refer to page 16 of 16, Section 5.0, Recommendations. The first paragraph provides goals of additional pilot programs. The third goal listed is to develop an understanding of changes in technologies over time as well as "ongoing quality control and potential interoperability, implementation and standards issues." Explain what is meant by "standards issues."

A-2. a. Page 9 of the 2008 Annual Report in Case No. 2007-00117, filed on April 1, 2009, describes that all CPP events which occurred in 2008 (including those which occurred on August 11 and August 12) were primarily initiated to test and monitor the integrity of the smart meter network price signaling system and preliminary response of program participants. CPP event which occurred on July 28, 2009, was initiated as a result of cooler than normal temperatures recorded for the month of June and July. During that time, LG&E expected a similar temperature trend to continue into the month of August. Consequently, LG&E decided to initiate the event to ensure adequate data is captured for an all inclusive program analysis, before 2009 summer's end.

b. Since the implementation of the pilot, new standards and technologies have emerged in the area of smart meter and smart grid. In order to evaluate the performance and cost-effectiveness of these technologies and standards, LG&E needs to have an understanding and insight into implementation requirements and related standards issues with new technologies and potential interoperability issues with legacy systems. LG&E's plan is to develop a future filing request that will be dependent on regulatory review and approval.

c.

(1) The kWh references were made as a result of a typographical error. Values referenced should have been represented in kW.

(2) The method referenced can only be accomplished through an intelligent two-way communication and demand response infrastructure synchronized with utilities load dispatch controls and enterprise system. Such system is beyond the capacity and budget of the existing pilot program. Additionally, the appliances which GE customers used in the pilot were first generation GE "smart" appliances. GE has indicated that the latest iteration of "smart" appliances being developed incorporates techniques designed to mitigate the bounce-back effect. Major electric household devices (i.e., HVAC systems, large kitchen appliances,

electric water heaters, etc.) will need to be designed to respond to demand response signals in a coordinated manner so that increase in system peak after the control event is diminished. Again, devices with such algorithms continue to be in early stages of development and are yet to be readily available for utility test and deployment.

d. Periodic tariff adjustment framework based on the revenue or the operating income may have to be adopted to adapt to specific smart meter and smart grid project environments. Generally, such tariff adjustments should take place on a regular basis to prevent erosion of the value of the collected revenues and ensure that the expenditures and the revenues are in balance.

e. Future pilot programs that LG&E contemplates would be developed with market research data and input from various advisory groups and case participants to determine if particular programs or technologies would or would not be supported. Among the anticipated outcomes of future pilot programs would be: to gain an understanding of customer perspectives of smart meter and smart grid technologies; an understanding and experience with increased amounts of data being generated from smart meters and smart grid devices; how that data will be managed with existing IT infrastructure; learn more about smart grid technologies that provide customers with energy usage data to make more informed decisions; and how smart grid technologies may aid in providing reliable service and high customer satisfaction. As stated previously, future pilot programs will be dependent on regulatory review and approval.

f.

(1) The meters used in the pilot program are ordinary electronic meters equipped with an electronic two-way communications card. While these meters maintain the same recording and measurement capabilities of a typical electric service meter, built-in electronic communications cards are outdated in comparison with technologies available on current smart meters. More specifically, hardware and software versions employed on the communications cards used in the pilot program are obsolete and lacking in performance in comparison to two-way communications solutions being implemented on smart meters today.

(2) In-home devices obtained by customers participating on the pilot program will become ineffective as LG&E replaces smart meters through regular meter exchanges. Both, in-home display device and load control switch will lose their core functionality, while the smart thermostat will maintain the functionality and features of a standard programmable thermostat only. Hence, LG&E plans to notify the affected customers that it will accept device returns but will not seek to retrieve these devices. Also, LG&E plans to recommend customers an option to enroll and participate in its direct load control program and other DSM programs.

g. "Standards issues" refers to the integration of smart grid technologies which can be described as a "system of systems." For example, smart meter technology could be specified, in part, on the communications requirements of existing infrastructure based on cost-effectiveness measures; i.e., it complies with standards established for metering, integration with IT systems, etc. LG&E monitors development of industry standards (e.g., NIST, IEEE, CIP), and how these standards may affect future deployment of smart grid systems and technologies (e.g., in-home displays, "smart" appliances, plug-in hybrid electric vehicles, etc.). Simply stated, smart grid standards will help insure that new technologies are "backward" and "forward" compatible with legacy systems and new technologies not yet developed or contemplated.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 3

Witness: Michael E. Hornung

Q-3. If authorized to discontinue the Responsive Pricing Tariffs, explain how LG&E will notify affected customers of the migration to the standard tariff.

A-3. LG&E plans to notify affected customers of the migration to the standard tariff through letter mail, e-mail and automated phone calls to ensure all program participants are informed. LG&E will transition customers' accounts to standard rate schedule in accordance with their respective billing cycle. As described in the answer provided to Question No. 2, LG&E will communicate device handling guidelines to program participants who obtained in-home devices. In addition, LG&E will provide these customers with an opportunity to enroll in its direct load control program and other DSM programs.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 4

Witness: Michael E. Hornung

Q-4. Refer to page 2 of 2 of the October 31, 2011 LG&E Letter to the Commission's Executive Director. At the top of the page, it states that "Those customers who received critical peak pricing ("CPP") signals shifted their energy use but created a 0.5 - 0.8 kW per customer higher peak than the original system peak and consumed more energy." Explain how a small number of responsive pricing customers shifting usage away from peak times can create a higher peak than the original system peak.

A-4. The referenced result describes the bounce-back effect and was determined when sampling proportion of the total control group population (representing original system peak) was decreased to only customers on the Responsive Pricing program, to ensure statistical validity throughout the course of the analysis study. The increase in system peak is attributed to participants' electric household devices coming back online instantaneously after the last hour of a CPP event. Thus, the Responsive Pricing participants increased their energy use and created a peak which exceeds the peak of the corresponding control group.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 5

Witness: Michael E. Hornung

Q-5. Refer to the Commission's July 12, 2007 Order in Case No. 2007-00117, page 12. What is a current full customer-specific costs estimate?

A-5. Current customer specific costs remain unchanged at $193.00 per participant. However, this cost does not reflect the expenditures incurred for the communications network infrastructure and hosted services provided by the existing smart meter vendor, all of which are required for maintaining the Responsive Pricing pilot program operational. Please refer to the answers provided to Question No. 6, Question No. 7 and Question No. 9 for additional explanation.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 6

Witness: Michael E. Hornung

Q-6. Refer to page 2 of 2 of the October 31, 2011 LG&E Letter to the Commission's Executive Director. In the first full paragraph, three lines up from the bottom of that paragraph, LG&E states that, "continuation of this program is not expected to provide benefits over the required costs".

a. Define the phrase "required costs".

b. Give specific examples and the estimated amounts of these required costs.

A-6. a. The phrase "required costs" represents expenditures related mainly to the hosting of meter data management services and network infrastructure operations and maintenance. Hosted meter data management services are required to ensure time-of-use reads are captured for appropriate billing of Responsive Pricing program participants. Additionally, these services enable pilot program participants to access customer specific hosted web portal. Hosted services solution is also used for timely updates of responsive pricing rates on a monthly basis. Pilot's network infrastructure consists mainly of smart meters and data collectors, known as communication gates. As described in pilot annual reports, data collectors are used to accumulate all the metering data and serve as network coordinators. The data collected is sent to a hosted server via internet protocol. Approximately twenty communication gates are currently installed and required for the meter data and rate updates to be continually reported through the network.

b. Current hosted services solution specific costs are estimated to be $10,500 per month. Pole mounted data collector is estimated to cost $950 each, while a meter socket based version costs $2,256 each. Equipment maintenance hourly rate is estimated to be $81.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 7

Witness: Michael E. Hornung

Q-7. If the Commission denies LG&E's request to cancel and withdraw the Responsive Pricing and Smart Metering Tariff, what would be the monthly incremental costs incurred by LG&E to keep this tariff active versus the standard tariffs?

A-7. The monthly incremental cost which would be incurred by LG&E is estimated to be $20,000. This estimate does not include any unexpected equipment replacement costs which may have to be incurred to ensure reliable operation of the communication network. Moreover, hosted services solution availability and term is not guaranteed. Existing smart meter vendor has expired the platform currently being utilized in the pilot program and is expected to impose further cost increase for supporting the program indefinitely on such customized basis.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 8

Witness: Michael E. Hornung

Q-8. If the Commission denies LG&E's request to cancel and withdraw the Responsive Pricing and Smart Metering Tariff, are there any other costs LG&E would have to incur to keep this tariff active, such as communication costs, updated metering costs, billing system costs, etc.?

A-8. Please refer to the answers provided to Question No. 6 and Question No. 7.

LOUISVILLE GAS AND ELECTRIC COMPANY

Response to the Commission Staff's Initial Request for Information
Dated December 22, 2011

Case No. 2011-00440

Question No. 9

Witness: Michael E. Hornung

Q-9. Identify any other obstacles and costs LG&E would incur if it were required to continue this tariff on a permanent basis.

A-9. LG&E finds that the existing technology solution is not most appropriate for continuing the tariff on a permanent basis due to a couple of reasons. As described in the answer to Question No. 6, the information from smart meters on the pilot program is collected through a hosted data management system and is then routed to LG&E for billing purposes. The fees associated with employing hosted services are expected to increase periodically, in addition to cost estimates provided in the answer to Question No. 6. Furthermore, hosted services solution method is appropriate for short term projects; however it is not ideal for permanent deployment. Smart meter vendors rely on utilities to ensure meter data management systems are in place prior to permanent smart meter deployment. The information collected by these systems is fundamentally what makes smart meters "smart". LG&E was unable to evaluate and implement fully computerized meter data management system capabilities of their own, given that such systems were not readily available and economically feasible during the pilot deployment. To continue the tariff on a permanent basis LG&E believes a scalable meter data management system will have to be implemented to ensure effective operations. Such scalable system could cost at least $500,000 and would necessitate significant planning and development to guarantee smooth implementation with LG&E's current enterprise system. Then again, the communications infrastructure, smart meters and premise devices used in the pilot program are dated and would need to be replaced with new equipment employing the most recent hardware and software. LG&E finds that these costs may not be economically justifiable for maintaining the remaining sample of Responsive Pricing participants.