

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF LOUISVILLE GAS AND )  
ELECTRIC COMPANY FOR APPROVAL OF ) CASE NO. 98-426  
AN ALTERNATIVE METHOD OF REGULATION )  
OF ITS RATES AND SERVICES )

In the Matter of:

APPLICATION OF KENTUCKY UTILITIES COMPANY )  
FOR APPROVAL OF AN ALTERNATIVE METHOD ) CASE NO. 98-474  
OF REGULATION OF ITS RATES AND SERVICES )

O R D E R

IT IS ORDERED that Louisville Gas and Electric Company ( LG&E ) and Kentucky Utilities Company ( KU ) shall file the original and 12 copies (except as specified in No. 1 below) of the following information with the Commission with a copy to all parties of record no later than January 22, 1999. LG&E and KU shall furnish with each response the name of the witness who will be available to respond to questions concerning each item of information requested should a public hearing be scheduled.

1. Provide two copies of the handouts distributed at the informal conferences held on November 20, 1998 and December 17 and 18, 1998.

Fuel Cost Recovery

2. When calculating the percentage change in actual fuel costs under the applicants proposal:

a. Explain why it is appropriate to compare a current quarter of 3 months with a base period that includes 12 months.

b. Explain why it wouldn't be more appropriate for the two time periods to reflect the same number of months.

3. The applicants have proposed that the fuel cost recovery reflect actual cost and index changes for both coal and natural gas, using a weighted average approach. Explain why this approach is more reasonable than having two separate fuel cost recovery calculations, one for coal and one for natural gas.

4. Refer to page 22 of the Fuel Price Index handout from the December 17, 1998 informal conference.

a. Based on the statements shown in part (C), isn't it correct that the change in fuel cost recovery, CR, never equals the change in actual fuel cost, CA?

b. Explain what would happen in the event that CA equaled CI. Indicate where in the proposed tariffs this possible eventuality is addressed.

5. For each of the hypothetical situations described below, indicate whether the stated change in fuel cost recovery is correct.

a. The CA is a positive 2.5 percent, the CI is a positive 1.3 percent, and the resulting CR is a positive 1.3 percent.

b. The CA is a positive 2.5 percent, the CI is a negative 1.3 percent, and the resulting CR is a negative 1.3 percent.

c. The CA is a positive 1.3 percent, the CI is a positive 2.5 percent, and the resulting CR is a positive 1.9 percent.

d. The CA is a negative 2.5 percent, the CI is a negative 1.3 percent, and the resulting CR is a negative 1.9 percent.

6. When comparing the proposed fuel cost recovery mechanism to the current fuel adjustment clause, is it generally correct that:

a. In periods where fuel costs are rising over time, ratepayers will pay less of the cost increases under the proposed fuel cost recovery because of the limitations imposed by the index?

b. In periods where fuel costs are decreasing over time, ratepayers will be credited with lower costs sooner under the current fuel adjustment clause because of the limitations imposed by the index?

7. Reference Willhite testimony, page 12, lines 11-13. Provide a detailed explanation and workpapers to support the stated savings for each company of \$812,036. Identify the three months referred to in this testimony.

8. Does the Fuel Price Index consider the different fuel requirements of the various generating stations? If not, would the incorporation of varied fuel requirements change the operation of the index? Explain your response.

9. For the six months ended June 30, 1998, show the charge or credit to the bill of a customer using 1200 KWH of electricity using the present Fuel Adjustment Clause and the proposed Fuel Price Index. Show this data for both KU and LG&E.

#### Rate and Tariff Flexibility

10. Refer to the Rate and Tariff Flexibility handout from the December 17, 1998 informal conference. Concerning the rate and tariff flexibility proposal:

a. Would all of the value based customized services be offered by the regulated utility or an unregulated affiliate? Identify those services that would be provided by an unregulated affiliate.

b. Explain what is meant by the phrase certainty of implementation. How does this provision differ from current regulatory circumstances?

c. When referencing expedited Commission approval, are the utilities requesting that the Commission surrender its ability to extend the period of time necessary to review a new tariff that may contain innovative features new to Kentucky? If yes, explain why the Commission should do this. If no, explain what is meant by the proposal.

11. Will each new tariff filing be accompanied by prepared testimony explaining the tariff and the reasons why a special contract is necessary rather than a tariff of general applicability?

#### Generation Performance

12. Describe in detail the impact on the generation performance measure for LG&E and KU resulting from the joint dispatch and operation of the generation assets since the merger.

13. Explain why it is more reasonable to have a composite generation performance measure with one threshold rather than evaluate separately the equivalent availability factor and the capacity factor, using different thresholds for each factor.

14. Refer to the charts shown on pages 10, 12, and 18 of the Generation Performance handout from the December 17, 1998 informal conference. Prepare a

chart listing the equivalent availability factor, the capacity factor, and the resulting generation performance measure for each quarter shown on the charts.

15. Explain why the utilities did not propose a deadband around the threshold value selected for the generation performance.

16. Refer to the Generation Performance handout from the December 17, 1998 informal conference.

a. Page 16 states that, Improvements above threshold may come at an incremental cost. Explain what would cause the incremental cost.

b. Explain why the performance threshold is set at 71.8 instead of a lower value such as 68.0.

c. Explain how the EUDH and EPDH will be calculated.

### Service Quality

17. Refer to pages 29 and 30 of the Service Quality handout from the December 18, 1998 informal conference. Provide the detailed calculations supporting the proposed penalty/reward rates for each service quality category. Indicate the source for all data used in the calculations. For any financial data used, identify the period of time the data reflects.

18. Provide the following information relating to the overall customer satisfaction surveys.

a. How frequently will the overall satisfaction residential customer surveys be performed?

b. Will the surveys be administered in-house, or do LG&E and KU plan to hire an outside firm? If an outside firm, identify the firm or indicate when the firm is expected to be hired.

c. Will the survey sample size be determined using statistical sampling techniques or will a fixed number be used? If a fixed number, explain in detail how the sample number will be determined.

d. If the sample size was not determined using statistical sampling techniques, explain in detail how LG&E and KU will be able to develop legitimate inferences about the customer population as a whole.

e. If statistical sampling techniques are being used to determine the survey sample size, provide the values used to calculate the sample size, including the population, the reliability factor, and the confidence level factor. Include an explanation of how the values were determined.

f. Explain how the sample will be selected from LG&E s and KU s customer records.

g. Will LG&E and KU select the sample, or will the outside firm administering the survey do this?

h. Will any sample selection restrictions be in place to prevent the same customer from being selected in two or more consecutive survey periods? If yes, describe the restrictions. If no, explain why this would not be done.

i. If a selected customer cannot be contacted during the survey, explain how this situation will be handled.

j. Provide copies of the survey questions for both LG&E and KU.

19. Explain why the exclusion of severe storms justifies the decision not to establish deadbands around the SAIDI and SAIFI benchmarks.

20. Refer to page 21 of the Service Quality handout from the December 18, 1998 informal conference. Given LG&E's and KU's current regulatory environment, explain why it is reasonable to base the overall customer satisfaction penalty/reward rates on a proxy for revenues that would be at risk in a competitive market.

21. Refer to the testimony of Ronald L. Willhite, page 17. Mr. Willhite states: Any Service Quality reward in excess of the Generation Performance will be banked and included in the following quarter's Service Quality computation. Any rewards not recovered after four quarters will be relinquished.

a. Explain the need for and the reasonableness of this provision of the Service Quality mechanism.

b. If LG&E and KU are allowed to bank excess Service Quality rewards for four quarters, could this lead to a disincentive in dealing with future service quality problems, since LG&E and KU would know that penalties would be offset by banked rewards? Explain the response.

22. Refer to the Service Quality handout from the December 18, 1998 informal conference.

a. Explain the reason for excluding severe storms from SAIDI and SAIFI.

b. Define the phrase OSHA recordable incidence rate. Would accidents involving contractors be reported to OSHA?

c. Can LG&E and KU determine accurately the actual number of customers affected by an outage? If yes, explain.

d. Assuming SAIFI and SAIDI are calculated for every feeder of LG&E and KU substations, would the benchmark values shown on page 11 be reasonable? If no, what would be reasonable?

e. Provide historical annual SAIFI and SAIDI by substation and feeder for the past five years.

### Estimation of the Cost Model

23. In the file, code2.txt, on pages 2-6, the following variables are defined as follows:

$$\begin{aligned} X1 &= \text{LPLPM}, X2 = \text{LPKPM}, \text{ and } X3 = \text{LPEPM}; \\ DX1 &= \text{DLTCPL}, DX2 = \text{DLTCPK}, \text{ and } DX3 = \text{DLTCPE}; \\ MDX1 &= DX1 \quad TDX1, MDX2 = DX2 \quad TDX2, MDX3 = DX3 \quad TDX3; \\ MDX1\text{Actual} &= DX1 \quad TDX1; \\ MY &= Y \quad TY; \\ \text{Imtcpm} &= my; \\ \text{MTC} &= \text{EXP}(MY)*\text{PMMX}; \\ \text{ItcpMhat} &= MY. \end{aligned}$$

a. Explain what each of these variables represents, how each is obtained (that is, provide the formula), how each is used in model, and whether each is in the cost-share equations.

b. Are MDX1 and MDX1Actual equivalent and do they have the same formula?

c. What type of Transformation is T, and what is T equal to?

d. What is MX?

e. Are my and MY equivalent? If so, are Imtcpm and ItcpMhat equivalent, so that preddiff = 0?



24. Also in code2.txt, on page 7 is a formula for COSTA.

a. State what each of the equations represents and state if they are cost-share equations.

b. What is AY?

25. Also, code2.txt, on pages 8-9, contains a list of estimated coefficients, standard errors, and t-stats for the parameters in a model. Under the assumption that this is somehow related to the regression results presented in the October 12, 1998 filing (Exhibit MNL-2, page 20 of 23), and assuming that  $PO = PM$ , the only coefficients that seem to match are those that involve output. None of the others, i.e., those of the input prices, their squares and cross products, seems to correspond.

a. Should these match, or are the two unrelated?

i. If they are related, explain thoroughly their relationship. Are the results in MNL-2, page 20 of 23, derived from those in code2.txt, pages 8 and 9? If so, explain the derivation, including the formulas used to derive each and every coefficient in MNL-2 that differs from its counterpart in code2.txt on pages 8 and 9.

ii. If they are not related, then what is the significance of code2.txt, and where are the requested workpapers supporting the results displayed in Table 4, MNL-2, page 20 of 23?

A. What does DNYCAMAMENJCT represent on page 9 of code2.txt?

B. What are CRANKYTOTR and CRANKR on page 10 of code2.txt?

26. Pages 12 14 of code2.txt lists the actual total cost (TCACTUALR), the predicted difference between actual and predicted total cost (PREDDIFFR), and the t-statistics and standard errors of those differences. However, in no place on any of these pages is the predicted total cost shown.

a. Given this, how was the predicted difference calculated, and what formula was used to obtain the standard errors of these differences? Your response should include more than a reference to a page of code2.txt, since this page contains the programming code only and not the underlying econometric theory. In addition, please cite the reference from which the formula came.

b. Include as an example the calculations for KU, which is number 52 on page 13 of code2.txt. More specifically, show how the predicted difference of -.208792 and the standard error of 0.017445 were obtained.

#### Econometric Cost Study filed on October 12, 1998

27. According to economic theory, the own price elasticities of demand for the production inputs should be negative. However, given the parameter estimates listed in Table 4 of Exhibit MNL-2, page 20 of 23, the own price elasticity of demand for energy is positive, indicating that more energy is employed as an input as its price rises, which contradicts economic theory. Given this, is it fair to say that the conclusions drawn by Mr. Lowry from these results are unfounded and inappropriate?

28. Explain the difference between between and within estimation. Why was the former chosen in the LG&E/KU econometric analysis?

Response to Commission Order filed on December 14, 1998

29. Upon examining the data set, contained in DATA.xls, the price of energy is not included in the data set.

a. Absent the price of energy, explain how the estimates for PE, PEPE, PEPO, PEV, and PEN were obtained.

b. If the adding-up conditions for linear homogeneity were employed to derive the estimates in (a) above, then would Dr. Lowry agree that the leaving out of the price of energy creates an omitted variable bias, thus causing the model to be misspecified, and the results in Table 4 of MNL-2 invalid?

c. Explain how the standard errors, and hence t-statistics, were computed for the estimated coefficients of all of the energy-price related terms.

30. Item 1, page 1 of 5, part (g) requested a list of the relative ranking of KU and LG&E (based on Retail Price Index) compared to other utilities in the survey. Dr. Lowry's response references KPSC-1G, page 3 of 5, which ranks the utilities in the survey based on their average total cost, not on the Retail Price Index. Is this index equivalent to Average Total Cost? If so, then demonstrate the relationship between the two. Explain thoroughly.

31. Item 15 states that the single binary variable equals unity if the utility faces either large DSM or unregulated purchases; zero otherwise. The response further states that no consideration was given to the option of using a binary variable for each of these conditions. Explain thoroughly the reason this option was not considered, especially given that standard economic theory dictates that a binary variable is

employed to measure qualitative differences within a variable, those differences often being mutually exclusive (for example, male or not male; college degree or not, etc.).

a. How many of the firms in the sample had large DSM expenses, but were not required to make unregulated purchases? How is large defined?

b. How many were required to make unregulated purchases, but had small or no DSM expenses?

c. As with the leaving out of any explanatory variable, the model becomes misspecified and the parameter estimates biased, thus rendering the conclusions of the model invalid. Provide the estimation results from an equation that includes one dummy variable for large DSM and another dummy variable for unregulated purchases.

32. Item 17 asked whether there were any tests for heteroskedasticity or serial correlation performed and what the results were. The response stated that the between estimation removed the within-company variation that would be the source of the serial correlation, but the response does not mention heteroskedasticity.

a. Were any tests performed for heteroskedasticity?

b. If so, which ones and what were the results of the findings?

c. If the presence of heteroskedasticity was confirmed, what was done to remedy the problem?

33. Refer to Item 2, page 3 of 3, KPSC-2B. The purpose of this table is not clear. It seems that its sole purpose is to provide a measure of the accuracy of the model's predictive capability. For example, KPSC-2B shows that KU's actual cost is approximately 21% below that which is predicted by the model, which seems to indicate

that the model is not accurately predicting the actual cost. Explain how a greater degree of variation between a utility's predicted and actual cost demonstrates superior performance.

a. Explain all bases for Dr. Lowry's conclusion at page 22 of 23 in Exhibit MNL-2, that KU is a significantly superior performer.

b. Is it true that Western Pennsylvania Power, whose actual cost is 23.5% below its predicted cost (see KPSC-2B), is an even more superior performer than KU?

c. If (b) above is true, explain how a firm whose average total cost is 23% higher (as shown in KPSC-1G, Western Pennsylvania Power's ATC is 23% greater than that of Kentucky Utilities) is considered a more superior performer than KU.

Done at Frankfort, Kentucky, this 11<sup>th</sup> day of January, 1999.

By the Commission

ATTEST:

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Executive Director