

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

APPLICATION OF KENTUCKY)	
UTILITIES COMPANY FOR AN)	CASE NO. 2014-00371
ADJUSTMENT OF ITS ELECTRIC RATES)	

**ALICE HOWELL, CARL VOGEL AND SIERRA CLUB’S RESPONSES AND
OBJECTIONS TO COMMISSION STAFF’S REQUESTS FOR INFORMATION**

Intervenors Alice Howell, Carl Vogel and Sierra Club (collectively “Sierra Club”) hereby submit their responses and objections to Kentucky Utility Company’s (“KUC” or “the Company”) Requests for Information.

GENERAL OBJECTIONS

- A. Sierra Club objects to Requests that are not relevant to the above referenced proceedings. Kentucky Rule of Evidence 401.
- B. Sierra Club objects to Requests that are not “reasonably calculated to lead to the discovery of admissible evidence.” Kentucky Civil Rule 26.02(1).
- C. Sierra Club objects to Requests that are overly broad, unduly burdensome, oppressive, or calculated to take Sierra Club and its staff away from normal work activities, and require them to expend significant resources to provide complete and accurate answers. Kentucky Civil Rule 26.02.
- D. Sierra Club reserves all of its evidentiary objections or other objections to the introduction or use of any response at any hearing in this action.
- E. Sierra Club does not, by any response to any Request, waive any objections to that Request.

- F. Sierra Club does not admit the validity of any legal or factual contention asserted or assumed in the text of any Request.
- G. Sierra Club reserves the right to assert additional objections as appropriate, and to amend or supplement these objections and responses as appropriate.
- H. The foregoing general objections shall apply to each of the following Requests whether or not restated in the response to any particular response.

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 1
Respondent: Paul Chernick

Request No. 1: Refer to the Testimony of Paul Chemick (“Chernick Testimony”), pages 15-16.

The negative signs in front of the elasticity estimates as well as footnote 15 on page 15 indicate a decrease in consumption resulting from an increase in electricity rates. State whether the studies cited on these pages specifically indicated that an increase in rates results in an opposite and equal change in electricity demand, as the Testimony implies. Provide any discussion of such conclusion in the studies cited.

Response No. 1:

The studies cited on these pages indicated that an increase in rates results in an opposite change in electricity demand (that is, a decrease), but not an equal decrease, as explained in lines 8–10 and 17–18 of page 15 and in footnote 15. Mr. Chernick’s testimony does not “imply” that the elasticity, either short- or long-term, is -1.0 , as suggested by the question’s reference to an “equal and opposite change.” Indeed, Mr. Chernick’s testimony clear states that price elasticities are generally less than unity.

Request No. 2: State whether any of the studies cited in the Chernick Testimony, pages 15-16, specifically included the relative impact of changes to fixed monthly customer charges in combination with changes in energy rates. Provide any such discussion from the studies cited.

Response No. 2

Some of the studies cited by Mr. Chernick do not explicitly discuss the effect of changes in the fixed monthly charge, while others either estimate an income elasticity and treat the monthly charge as a reduction in income, or explicitly model the effect of the monthly charge (with other infra-marginal charges) as well as energy rates. The most common approach estimates both the price elasticity of demand (the percentage change in usage in response to a 1% change in marginal energy price) and the income elasticity of demand (the percentage change in usage in response to a 1% change in the customer's income). The following summarizes Mr. Chernick's review of the treatment of fixed customer charges in the studies cited:

- Espey and Espey (2004) is a review article and meta-analysis of price effects of the total bill and of income effects and does not address separately address fixed monthly customer charges and marginal prices. Some of the underlying articles may do so; most include income elasticities.
- Acton, Bridger, and Mowill (1976) show that the effect of the fixed monthly customer charge should be expressed solely through the income elasticity, which they estimate to be about 0.4 (a 1% increase in income would increase energy use

0.4%). The \$7.25/customer-month difference between the current and proposed customer charges would be \$87/year. For a household with a \$60,000 income (a little higher than the Kentucky average, but probably a little lower than the KU/LG&E average), \$87 would be a 0.15% change in the household's effective income. With a 0.4 income elasticity, usage would be expected to change 0.06%, or about $\frac{3}{100}$ th of the 2% effect of the associated change in energy prices.

- McFadden, Puig, and Kirshner (1977) do not appear to address fixed charges.
- Barnes, Gillingham, and Hageman (1981) explicitly treat the rate-structure premium (the difference between the actual bill and the bill that would be computed at the marginal energy rate) as a reduction in household income, and finds an income elasticity of 0.20, which would result in half the effect estimated from Acton, et al, or about $\frac{15}{1000}$ th of the price-elasticity effect.
- Henson (1984) models the fixed charge as part of the rate-structure premium and finds that “Changes in the rate structure premium, reflecting changes in inframarginal prices, are not found to have significant effects on consumption.”
- Reiss and White (2005) do not explicitly consider fixed charges and find that “the income effects are mostly statistically insignificant and negligible as a practical matter.”
- Xcel Energy Colorado (2012) estimated the overall effect of an inverted-block rate, without attempting to distinguish between the marginal price effect and any potential offset from changes to the rate-structure premium.
- Orans, et al (2014) did not address fixed charges, even though the BC Hydro tiered rate they studied has a fixed monthly charge of about \$5 (Canadian).

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 3
Respondent: Paul Chernick

Request No. 3: Refer to the Chernick Testimony, page 16, lines 11-15. State whether it is Sierra Club's position that Kentucky Utilities Company's ("KU") proposed increases to the residential basic service charge and energy charge will result in an increase in residential load of 2 percent.

Response No. 3:

The 2% increase is a reasonable estimate of the effect of the lower energy charges associated with the Company's significant increase in the fixed charge, versus the alternative rate structure in which all of the approved revenue requirement increment is recovered through higher energy rates.

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 4
Respondent: Paul Chernick

Request No. 4: Refer to the Chernick Testimony, page 19, lines 18-21, which states, “As the Company and the region move to a system with gas on the margin in most high-load hours, and coal on the margin off-peak, the off-peak environmental costs are likely to exceed the on-peak environmental costs.” Explain how on-peak environmental costs could be lower than off-peak environmental costs, given that on-peak generation would include not only peaking generation, but also base load generation.

Response No. 4:

My statement referred to the environmental costs of the generating unit on the margin during the peak and off-peak times, not to the environmental costs of all generation during those periods (i.e., both peaking and base load). Only the marginal generation sources are affected by changes in load. If in some time period, half the energy in each hour is from coal with a lower dispatch cost and half from gas with a higher dispatch cost, a 5% or 30% reduction in load would reduce gas consumption; coal consumption would be unchanged.

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 5
Respondent: Paul Chernick

Request No. 5: Refer to the Chernick Testimony, page 20, lines 7-12. Explain whether Mr. Chernick believes it fair to customers to change the on-peak and off-peak periods after a customer has chosen a time-of-day tariff.

Response No. 5:

Yes. The alternative—that the rate would continue to encourage and reward load shifts that increase costs—is unacceptable. If the rate remains voluntary, the customer should be free to leave the rate. Furthermore, so long as adequate notice is provided of the change in the time periods, customers will have an opportunity to adjust their behaviors, adjust the settings on load-shifting equipment, and/or implement new technologies enabling them to adapt to the new time periods.

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 6
Respondent: Paul Chernick

Request No. 6: Refer to the Chernick Testimony, page 21, lines 4-6, which states, “A long peak period will do nothing to encourage shifting of loads from the highest-cost hours to lower-cost hours within that broad period.” Explain why the price differential between the on-peak and off-peak energy rate would not be incentive to shift load.

Response No. 6:

The quoted sentence refers to cost differentials *within* the long peak period and the lack of incentive for customers to shift load within that period, all of which would be priced at the peak price. However, the question refers to price differentials and shifting of loads between the peak period and the off-peak period, and thus has no connection to the quoted sentence. The price differential between on-peak and off-peak periods does provide an incentive to shift load. A long peak period may make shifting to off-peak more difficult, but some shifting to the off-peak would still be encouraged.

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 7
Respondent: Paul Chernick

Request No. 7: Refer to the Chemick Testimony, pages 39-40. Beginning at the bottom of page 39, Mr. Chemick states, “Shifting that portion of production and transmission costs from the peak rate to the off-peak rate in Exhibit MJB-11 would reduce the peak rate by about 7¢/kWh and increase the off-peak by about 1¢/kWh.” Provide the supporting calculations for these amounts.

Response No. 7:

See Attachment SC-Staff -7.

KPSC Case No. 2014-00371
SC Response to Commission Staff
Item No. 8
Respondent: Paul Chernick

Request No. 8: Refer to the Chernick Testimony, page 41, lines 7-12.

- a) Mr. Chernick recommends that winter evenings be included in the peak period for the Residential Time-of-Day Energy (“RTOD-E”) tariff. State whether Mr. Chernick recommends that the winter evening peak period be from 6:00 p.m. to 10:00 p.m. as mentioned on page 32 of his testimony. If not, provide the recommended hours for the evening peak period.
- b) Mr. Chernick recommends that the differential between the on-peak and off-peak periods be reduced for the RTOD-E tariff.
 - i) Assuming an \$18.00 Basic Service Charge as proposed by KU, provide Mr. Chernick's recommended rates for the on-peak and off-peak periods and show how those rates were determined.
 - ii) Assuming no increase in the Basic Service Charge from the current \$10.75, provide Mr. Chernick's recommended rates for the on-peak and off-peak periods and show how those rates were determined.

Response No. 8:

- a) The period of 6 PM to 10 PM would be about right. Mr. Chernick has not examined all the winter load and price data that may be available to the Company, so he cannot rule out the possibility that a slightly different period (e.g., 7 PM to 10 PM) would be preferable.

b)

- i) Before developing final “recommended rates,” including ideal on-peak and off-peak periods, I would prefer to see additional data and analysis, including a reconciliation of the slightly different pattern of load and prices, market values of energy and generation capacity, the marginal costs of transmission and distribution capacity, and the timing of the loads that contribute to transmission and distribution costs.

One simple redesign that does not require any additional data would be to correct the inconsistency in the Company’s methodology described in my testimony at page 39 line 19, to page 40 line 2. With the \$18 Basic Service Charge proposed by the Company, energy rates of \$0.06401/kWh off-peak and \$0.18034/kWh peak would be needed to raise the revenues shown for the proposed rates in Exhibit MJB-11. See Attachment SC-Staff-8, *tab KU Exhibit p3 v1*. The proposed rates collect slightly less than the current rate design; increasing the peak prices to \$0.18036/kWh would result in revenues closer to those shown in the existing rate design. See Attachment SC-Staff-8a, *tab KU Exhibit p3 v2*.

A more comprehensive redesign would include the winter evening in the peak hours, and shift April and October into the summer period, as suggested in my direct testimony. I have computed the on-peak rate with April and October shifted to summer and the winter hours beginning 6 pm to 9 pm (hours 18 through 21) counted as peak hours. The computation of the peak energy rate is shown in Attachment SC-Staff-8b, *tabs W On Nov-Mar and S On Apr-Oct*.

Attachment SC-Staff-8a, tab *KU Exhibit p3 v4* shows my computation of the peak price with this redesign, which is \$0.14448/kWh using the Company's proposed customer charge and the \$0.06401/kWh off-peak energy price from the example above.

- ii) As noted in part (i), I have not developed "recommended rates for" ideal on-peak and off-peak periods. Starting with the rates developed in part (i), moving \$7.25/customer-month into the off-peak rate (to maintain the customer charge at \$10.25), and adjusting the peak rate to minimize the effect on total revenues, produces energy rates of \$0.07106/kWh off-peak and \$0.18033/kWh peak. See Attachment SC-Staff-8a, tab *KU Exhibit p3 v3*.

Finally, I computed the peak price, including the winter evening in the peak hours and shifting April and October into the summer period, with the \$10.25 customer charge and the \$0.07106/kWh off-peak energy price from the *v3* tab. Under this scenario, the peak price would be \$0.14664/kWh. See Attachment SC-Staff-8a, tab *KU Exhibit p3 v5* for my computation.

Respectfully submitted,

Dated: April 6, 2015



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CERTIFICATE OF SERVICE

It is hereby certified, this the 6th day of April, 2015, that the attached discovery responses are true and correct copies of the documents being filed in paper medium; that the electronic filing has been transmitted to the Commission on April 6, 2015; that there are currently no parties that the Commission has excused from participation by electronic means in these proceedings; that an original and one copy of this document is being mailed to the Commission for filing on April 6, 2015; and that an electronic notification of the electronic filing will be provided to all counsel listed on the Commission's service lists in these proceedings.

