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Ms. Stephanie L. Stumbo
Executive Director
Kentucky Public Service Commission
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December 22, 2008

RE: ***CONSIDERATION OF THE REQUIREMENTS OF THE FEDERAL ENERGY POLICY ACT OF 2005 REGARDING FUEL SOURCES AND FOSSIL FUEL GENERATION EFFICIENCY*** - **Administrative Case No. 2007-00300**

Dear Ms. Stumbo:

Enclosed please find an original and seven (7) copies of Kentucky Utilities Company ("KU") and Louisville Gas and Electric Company ("LG&E") Response to the Second Data Request of Commission Staff dated December 10, 2008, in the above-referenced docket.

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

Sincerely,

Rick E. Lovekamp

cc: Parties of Record

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

CONSIDERATION OF THE REQUIREMENTS OF THE FEDERAL ENERGY POLICY ACT OF 2005 REGARDING FUEL SOURCES AND FOSSIL FUEL GENERATION EFFICIENCY	)))))	CASE NO. 2007-00300

Response to Second Data Request
Of Commission Staff
Dated December 10, 2008

FILED: DECEMBER 22, 2008

VERIFICATION

STATE OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

The undersigned, **David Sinclair**, being duly sworn, deposes and says that he is the Vice President, Energy Marketing for Kentucky Utilities Company and Louisville Gas and Electric Company, 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.

DAVID SINCLAIR

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19th day of December, 2008.

Notary Public (SEAL)

My Commission Expires:

November 9, 2010

KENTUCKY UTILITIES COMPANY
LOUISVILLE GAS AND ELECTRIC COMPANY

ADMINISTRATIVE CASE NO. 2007-00300

Response to Second Data Request of Commission Staff
Dated December 10, 2008

Question No. 1

Responding Witness: David Sinclair

Q-1. With Regard To Strategy 1, *Improve the Energy Efficiency of Kentucky's Homes, Buildings, Industries and Transportation Fleet* and Strategy 2, *Increase Kentucky's Use of Renewable Energy,* explain any changes that will or may impact the utility's fuel or energy requirements for:

a. the near-term (1-3 years);

b. the mid-term (4-7 years); and

c. the long-term (beyond 7 years)?

A-1.

Kentucky Utilities Company and Louisville Gas and Electric Company (collectively, the "Companies") submitted their 2008 Integrated Resource Plan ("2008 IRP") in April 2008. Energy requirements[1] in the 'base case' electricity forecast of the 2008 IRP (absent the effect of company-sponsored energy efficiency and demand-side management programs) grow at an average annual rate of 1.3 percent between 2008 and 2025[2]. This results in 2025 energy requirements being 24 percent larger than in 2008. The base case forecast incorporates the impact of increasing appliance efficiencies and the Energy Independence and Security Act of 2007 ("EISA"). Between 2013 and 2017, the average annual growth in energy requirements declines to 1.0 percent due primarily to reductions in lighting-related consumption prompted by the EISA (see Section 6, pages 17-20, from Volume I of the 2008 IRP for more information regarding the EISA).

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[1] Energy requirements are the sum of sales to end-use customers and distribution losses.

[2] Between 2008 and 2025, peak demand in the base case forecast grows at an average annual rate of 1.4 percent, which is less than the 1.7 percent growth rate assumption in the 7-Point Strategy for the state as a whole (page 2)

In addition to the energy efficiency gains already incorporated in the base case forecast, the Companies have plans to implement additional energy efficiency and demand-side management programs. These programs are expected to reduce energy requirements by 1,062 GWh in 2025.

In the 2008 IRP, the Companies presented an 'Aggressive Green' scenario as a sensitivity to the base plan. The Aggressive Green scenario illustrates the impact of "efficiency at all cost" and a national commitment toward eliminating coal generation in favor of renewables. The Aggressive Green electricity forecast assumes that consumers purchase the most energy efficient equipment at regular replacement intervals regardless of cost. This is most likely to occur as a result of federal legislation mandating challenging minimum efficiency standards for electrical equipment and appliances. Incandescent light bulbs are phased out by 2012. New homes and buildings are built to the most energy efficient specification available. In addition, new homes are equipped with solar panels beginning in 2012[3]. Because customers are already pursuing energy efficiency measures, the Companies' energy efficiency programs are assumed to have no impact in the Aggressive Green scenario.

In the Aggressive Green energy forecast, large commercial and industrial customers are also assumed to increase their focus on energy efficiency. Large commercial customers consume 20 percent less energy by 2025 in the Aggressive Green scenario. The growth in industrial sales by industry segment is based on the Energy Information Administration's ("EIA's") low economic growth case in its Annual Energy Outlook 2007. The impact on industrial sales is assumed to be relatively less since the cost of energy for most industrial customers is significant and they – as a result – are already incented to invest in cost-effective energy efficiency measures (see the Aggressive Green Scenario in Volume III of the 2008 IRP for more information regarding the Aggressive Green scenario).

In the Aggressive Green electricity forecast, the average annual growth in energy requirements between 2008 and 2025 is reduced from 1.3 percent (in the base case forecast) to 0.4 percent. Energy requirements decline by an average of 0.3 percent per year through 2012 due to increases in lighting efficiencies and then grow by an average of 0.6 percent thereafter. By 2025, energy requirements in the Aggressive Green forecast are 16 percent lower than the base plan, which – coincidently – is consistent with the electricity-related efficiency reductions in Strategy 1 of the Kentucky's 7-Point Strategy. Given this fact, the Aggressive Green forecast is used as the basis for estimating the impact of Strategy 1 on energy requirements. Table 1 summarizes the differences between the base case and Aggressive Green forecasts. In the near-term (2008-2010), energy requirements are 3.3 percent lower; in the mid-term (2011-2014), energy requirements are 8.3 percent lower; in the long-term (2015-2025), energy requirements are 12.7 percent lower.

[3] Solar panels are assumed to offset the average home's energy requirements by 2,500 kWh/year.

Table 1 – Summary of Energy Requirement Differences

Year	Base Case (GWh)	Aggressive Green (GWh)	Percent Difference
2008	36,835	36,245	-1.6
2009	37,404	36,175	-3.3
2010	37,921	36,028	-5.0
2011	38,531	35,913	-6.8
2012	39,080	35,861	-8.2
2013	39,535	36,052	-8.8
2014	39,927	36,262	-9.2
2015	40,298	36,415	-9.6
2016	40,695	36,610	-10.0
2017	41,153	36,780	-10.6
2018	41,725	37,004	-11.3
2019	42,270	37,204	-12.0
2020	42,914	37,439	-12.8
2021	43,449	37,623	-13.4
2022	44,036	37,829	-14.1
2023	44,558	38,043	-14.6
2024	45,139	38,355	-15.0
2025	45,721	38,540	-15.7

Strategy 2 of the 7-Point Strategy calls for an incremental 6,192 GWh of renewable generation by 2025 (see Table 3 on page 42 of the 7-Point Strategy). The Companies currently account for approximately 34 percent of the state's total retail electricity sales.[4] If the Companies would be responsible for meeting a similar percent of the 7-Point Strategy's renewable target in 2025, then they would need approximately 2,291 GWh from renewable generation.

When developing the 2008 IRP, the Companies considered numerous renewable and non-renewable generating technology options (see Section 8, Table 8.(2).(c), Volume I of the 2008 IRP). None of the renewable generating options were selected in the optimal plan because they were not the least-cost resource to meet the forecasted energy requirements.

The Aggressive Green scenario in the 2008 IRP assumes that existing coal units must be retired after 50 years of life beginning in 2015 and that Kentucky adopts a mandatory renewable portfolio standard ("RPS") of 15 percent by 2020. In this scenario, the Companies' install in excess of 2,100 MW of renewable generation by 2020. This results in all load growth from 2008 to 2025 being met by renewables. Furthermore, much of the energy lost due to the forced retirement of

[4] In 2006, the Companies' retail sales totaled 29,751 GWh According to EIA, total retail sales in Kentucky for 2006 were 88,743 GWh

some coal units is replaced by renewable generation. While the assumptions of the Aggressive Green scenario are not the same as the 7-Point Strategy, the timing of the renewable capacity additions would likely be indicative of the Companies' approach to complying with the RPS in the 7-Point Strategy.

Two important considerations involved in evaluating renewable resources are: i) their ability to supply energy at time of peak, and ii) the amount of energy that they are capable of producing. For example, the net capacity factor of a wind turbine will vary by its location but typically ranges between 28 and 32 percent in the Midwest. Furthermore, because wind is relatively light on hot summer days (when the Companies set their system peak), the expected capacity value of a wind turbine can range from 5 to 10 percent of nameplate capacity. Therefore, if wind were to be used to meet the 7-Point Strategy's renewables goal of 1,000 MW at time of peak rather than just on a nameplate basis, it would require between 10,000 and 20,000 MW of nameplate wind capacity.

Another popular renewable technology is solar. Based on the information gathered for the 2008 IRP, solar photovoltaic costs $7,000-8,000/kW (in 2008 dollars). The capacity factor for solar in Kentucky is expected to be approximately 15-20 percent. This translates into a 30-year levelized cost of approximately $400/MWh before subsidy. Thus, solar photovoltaic was not identified as a least-cost option in the IRP. The 7-Point Strategy mentions that Germany has installed 1,328 MW of solar generation. It is important to note that the primary driver for this is that Germany pays approximately $600/MWh as an incentive to attract solar generation. Lastly, large scale solar requires significant land mass. As a rule of thumb, a 1,000 MW solar photovoltaic farm would require approximately 4,000 acres.

The Companies have also looked at a number of other renewable technologies, including hydropower, biomass, and landfill gas. The Companies are currently in the process of refurbishing their Ohio Falls hydropower facility. This will result in an increase in capacity at Ohio Falls of approximately 20 MW. In addition, the Companies have studied further expansion of capacity at Ohio Falls. However, the high capital cost of the expansion and the potential for archeological disturbances caused that expansion option to be uneconomic.

In the case of biomass, the largest constraint is fuel availability within an economical transport distance from existing generation sites. This constraint tends to limit potential biomass firing to less than 30 MW per site. Generally, each site burning biomass would need to add truck unloading facilities, additional fuel handling, and pulverizing capability. Depending on the type of biomass being burned, burner and furnace modification may also be required. These modifications will require significant capital to construct and do not add any generation capacity and potentially could result in some degradation of existing capacity.

The Companies are negotiating with a landfill gas owner that participated in the Companies Renewable RFP. Even though landfill gas generation will likely have a capital cost of over $2,000 per kW, landfill gas generation appears to be the least cost renewable resource available to the Companies. The available resource is limited however to 20 to 50 MW within the Companies' service territory.

The Companies are constantly evaluating alternative means to meet our customers' needs in a least-cost manner. As can be seen in the 2008 IRP, the cost and performance of today's renewable technology has so far not proven to be least-cost. However, the Companies will continue to monitor and evaluate technology developments related to renewable generation.