

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

**In the Matter of:**

<b>ELECTRONIC JOINT APPLICATION OF</b>	)	
<b>LOUISVILLE GAS AND ELECTRIC</b>	)	
<b>COMPANY AND KENTUCKY UTILITIES</b>	)	
<b>COMPANY FOR REVIEW, MODIFICATION,</b>	)	
<b>AND CONTINUATION OF CERTAIN</b>	)	<b>CASE NO. 2017-00441</b>
<b>EXISTING DEMAND-SIDE MANAGEMENT</b>	)	
<b>AND ENERGY EFFICIENCY PROGRAMS</b>	)	

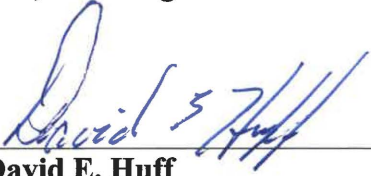
**RESPONSE OF**  
**LOUISVILLE GAS AND ELECTRIC COMPANY**  
**TO METROPOLITAN HOUSING COALITION'S**  
**SECOND SET OF DATA REQUESTS**  
**DATED FEBRUARY 21, 2018**

**FILED: MARCH 7, 2018**

**VERIFICATION**

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

The undersigned, **David E. Huff**, being duly sworn, deposes and says that he is Director of Customer Energy Efficiency & Emerging Technologies 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 that the answers contained therein are true and correct to the best of his information, knowledge and belief.

  
\_\_\_\_\_  
**David E. Huff**

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 6<sup>th</sup> day of March 2018.

 (SEAL)  
\_\_\_\_\_  
Notary Public

My Commission Expires:  
**JUDY SCHOOLER**  
Notary Public, State at Large, KY  
My commission expires July 11, 2018  
Notary ID # 512743 \_\_\_\_\_

**VERIFICATION**

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

The undersigned, **Gregory S. Lawson**, being duly sworn, deposes and says that he is Manager Energy Efficiency Planning and Development for Louisville Gas and Electric Company and Kentucky Utilities Company, an employee of 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 that the answers contained therein are true and correct to the best of his information, knowledge and belief.

  
\_\_\_\_\_  
**Gregory S. Lawson**

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 10<sup>th</sup> day of March \_\_\_\_\_, 2018.

  
\_\_\_\_\_  
Notary Public (SEAL)

My Commission Expires:  
**JUDY SCHOOLER**  
**Notary Public, State at Large, KY**  
**My commission expires July 11, 2018**  
**Notary ID # 512743**\_\_\_\_\_

**VERIFICATION**

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

The undersigned, **Rick E. Lovekamp**, being duly sworn, deposes and says that he is Manager – Regulatory Strategy/Policy for Louisville Gas and Electric Company and Kentucky Utilities Company, an employee of 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.

  
**Rick E. Lovekamp**

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 6<sup>th</sup> day of March 2018.

 (SEAL)  
Notary Public

My Commission Expires:  
**JUDY SCHOOLER**  
Notary Public, State at Large, KY  
My commission expires **July 11, 2018**  
Notary ID # 512743

VERIFICATION

COMMONWEALTH OF KENTUCKY )  
 ) SS:  
COUNTY OF JEFFERSON )

The undersigned, **Stuart A. Wilson**, being duly sworn, deposes and says that he is Director, Energy Planning, Analysis & Forecasting 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.

\_\_\_\_\_  
**Stuart A. Wilson**

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 6th day of March 2018.

(SEAL)

\_\_\_\_\_  
Notary Public

My Commission Expires:  
JUDY SCHOOLER  
Notary Public, State at Large, KY  
My commission expires July 11, 2018  
Notary ID # 512743

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests  
Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 1**

**Witness: David E. Huff / Gregory S. Lawson**

- Q-1. Please explain whether and how LG&E includes the following factors in conducting a cost-benefit analysis of individual demand-side management (DSM) or energy efficiency (EE) programs:
- a. The avoided costs of installation of controls or other utility system costs necessary to comply with limits on emissions, discharges, or management of wastes associated with generation of electricity.
  - b. The avoided health impacts and associated economic costs of exposure to pollutants generated from combustion of fossil fuels to generate electricity.
- A-1.
- a. Such costs are accounted for in the avoided costs of capacity and energy.
  - b. The Companies do not include non-energy benefits in the cost-effectiveness calculations based on the California tests.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests  
Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 2**

**Witness: David E. Huff / Gregory S. Lawson**

- Q-2. Please explain whether in assessing the benefits of energy efficiency LG&E included the avoided environmental compliance costs which are utility system costs in the Participant test, the total resource cost test and the Utility test. If so, please provide the value assigned to the avoided costs.
- A-2. The Companies fully account for the avoided cost of environmental regulations in their cost-benefit analyses. The Companies determine cost-effectiveness using the industry-standard and Commission-required California tests, which include accounting for costs to comply with applicable environmental regulations. Avoided environmental compliance costs are included in the avoided energy cost, which is an input to the Total Resource Cost test and the Utility Cost test. The Participant test does not use the avoided energy cost and thus according to the California Standard Practice Manual is not included in this test. The portion of the avoided energy cost related to avoided environmental compliance is up to approximately \$3/MWh of total unit marginal cost. Avoided capital costs associated with environmental compliance are also included, at least implicitly, in the avoided capacity cost used in their DSM-EE cost-benefit analyses.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**Case No. 2017-00441**

**Question No. 3**

**Witness: David E. Huff / Gregory S. Lawson**

- Q-3. Please explain whether the calculated benefit of energy efficiency would increase if LG&E included program participant non-energy benefits (NEBS) in their cost benefit analysis for both the Participant and the TRC tests?
- A-3. Yes, adding a benefit (here, non-energy benefits) would increase the overall calculated benefit of energy efficiency because solely increasing the benefits will naturally improve the cost-benefit test results. But NEBs are not jurisdictional to the Commission, making it inappropriate to include them in the Participant and TRC tests.



**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests**

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**Case No. 2017-00441**

**Question No. 4**

**Witness: David E. Huff / Gregory S. Lawson / Stuart A. Wilson**

Q-4.

- a. In assessing the benefits of energy efficiency and of DSM programs, did LG&E include the avoided costs of complying with current and future environmental regulations addressing greenhouse gas (GHG) emissions?
- b. If so, please indicate the value accorded such benefit, and the basis for that valuation.
- c. Please provide the value or values that LG&E has assigned to the cost of compliance with current and future greenhouse gas (GHG) emission regulations, in any regulatory filing before the Commission since 2010.

A-4.

- a. Please see response to Metropolitan Housing Coalition First Set of Data Requests Question No. 6.
- b. Not applicable.
- c. The Companies included price scenarios for CO<sub>2</sub> emissions in three filings since 2010. In all other regulatory filings, no CO<sub>2</sub> emissions prices were assumed.
  - In Case No. 2014-00002, two CO<sub>2</sub> price scenarios were presented, both of which are shown in the table below.
  - In Case No. 2014-00131, three CO<sub>2</sub> scenarios were presented. Two of the three scenarios were CO<sub>2</sub> price scenarios and are shown in the table below. The third CO<sub>2</sub> scenario included a CO<sub>2</sub> mass emissions cap of 29.4 million tons per year beginning in 2020.
  - In Case No. 2017-00483, two CO<sub>2</sub> price scenarios were presented, both of which are shown in the table below.

**CO<sub>2</sub> Emissions Prices (\$/short ton)**

	Case No. 2014-00002		Case No. 2014-00131		Case No. 2017-00483	
	Zero	Mid	Zero	Mid	Zero	Sensitivity
2019	0	0	0	0	0	0
2020	0	23	0	17	0	0
2021	0	26	0	20	0	0
2022	0	29	0	23	0	0
2023	0	33	0	26	0	0
2024	0	36	0	30	0	0
2025	0	39	0	33	0	0
2026	0	43	0	37	0	17
2027	0	47	0	40	0	18
2028	0	51	0	44	0	19
2029	0	55	0	48	0	21
2030	0	59	0	52	0	22
2031	0	63	0	56	0	23
2032	0	67	0	60	0	25
2033	0	72	0	64	0	26
2034	0	76	0	69	0	27
2035	0	81	0	73	0	29
2036	0	86	0	78	--	--
2037	0	91	0	83	--	--
2038	0	96	0	88	--	--
2039	0	102	0	93	--	--
2040	0	107	0	99	--	--
2041	0	113	0	104	--	--
2042	0	119	0	110	--	--
2043	--	--	0	116	--	--

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests  
Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 5**

**Witness: Stuart A. Wilson**

Q-5.

- a. Did LG&E use future CO<sub>2</sub> costs in case 2014-00002, specifically a CO<sub>2</sub> price in six of the twelve scenarios used in evaluating options?
- b. Please explain the source for any carbon prices used by LG&E in that proceeding, and the price values assumed in 2020, 2030, and 2040?

A-5.

- a. Yes. The Companies considered "Zero" and "Mid" CO<sub>2</sub> price scenarios.
- b. The "Mid" CO<sub>2</sub> prices case published by Synapse Energy Economics in their "2012 Carbon Dioxide Price Forecast" (October 4, 2012) was used to develop the Companies' Mid CO<sub>2</sub> price forecast. The Companies assumed CO<sub>2</sub> prices shown in the table below.

	2014 IRP Mid CO <sub>2</sub> Emissions Price (\$/short ton)
2020	23
2030	59
2040	107

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests**

**Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 6**

**Witness: David E. Huff / Gregory S. Lawson**

- Q-6. Focusing on the Utility Cost test, RIM test and TRC test, were the following factors considered in determining the costs or savings to the utility and its ratepayers, and including impacts associated with financial accounting, customer service and public safety:
- a. Improvement in water quality due to avoided discharge of pollutants;
  - b. Avoided costs of pollution control equipment installation and maintenance;
  - c. Avoided costs of equipment repair and replacement;
  - d. Reduction in morbidity and mortality from pulmonary and respiratory illness due to reduced emissions of fine particulates;
  - e. Reduction in ground-level ozone exceedances due to lower emissions of ozone precursors;
  - f. Improvement in workplace productivity attributable to reductions of pollutants associated with electricity generation;
  - g. Improvement in classroom productivity attributable to reductions of pollutants associated with electricity generation;
- A-6. Financial accounting, customer service, and public safety costs are not part of the California set of cost-effectiveness tests, including the Utility Cost test, RIM test, and TRC test. The avoided costs of additional pollution control equipment installation and new equipment related to new generation are included in the avoided capacity cost. Maintenance, avoided cost of equipment repair and replacement of existing equipment are not included in the cost-effectiveness tests as they are directly related to maintaining existing supply.
- a. Compliance with water quality regulations is included in our avoided capacity costs.

- b. and c. Equipment related to additional generation is included in our avoided cost of capacity. Replacement equipment costs are not included in avoided costs as it is required to maintain current generation supply requirements.
- d. These are NEBs and are not included in avoided costs.
- e. Compliance with air regulations would be included in avoided costs. General reduction in ozone is an NEB and would not be included.
- f. and g. The Companies have no knowledge of the correlation between pollutants and productivity. Regardless, these would be NEBs and are not included.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests  
Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 7**

**Witness: David E. Huff / Gregory S. Lawson / Stuart A. Wilson**

- Q-7. If the answer to Question 2-6 is "yes," please describe the value assigned to each factor considered in determining costs and benefits of individual EE and DSM programs, and the basis for the assigned value.
- A-7. Because the current avoided cost of capacity is zero, each of the factors would also be zero. The avoided energy costs are made up of fuel, emission allowances, and environmental consumables, thus there are no monetary values for any of the factors in question 6 included in the avoided cost of energy.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests  
Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 8**

**Witness: David E. Huff / Gregory S. Lawson**

Q-8. Does LG&E have access to GIS mapping?

A-8. Yes.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests  
Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 9**

**Witness: Rick E. Lovekamp**

- Q-9. Please provide, by census tract, the average yearly bill per customer. If LG&E does not maintain that information by census tract, please provide the information based on the smallest congregate geographic area that LG&E uses or has used to provide the average yearly bill per customer.
- A-9. The requested information is not available by Federal census tract. Attached is the requested information for residential customers by zip code for calendar years 2011 - 2017.



Company	Zip Code	Average Annual kWh Usage						
		2011	2012	2013	2014	2015	2016	2017
LG&E	40010	1,555	1,579	1,556	1,526	1,522	1,529	1,417
	40014	1,498	1,423	1,432	1,438	1,391	1,380	1,297
	40018	910	1,001	1,299	1,883	1,793	1,594	1,494
	40022	1,777	1,549	1,614	1,715	1,459	1,467	1,400
	40023	1,725	1,674	1,695	1,715	1,645	1,625	1,502
	40025	3,164	3,045	3,042	3,053	2,920	2,929	2,793
	40026	1,833	1,696	1,741	1,804	1,695	1,642	1,575
	40027	461	423	448	488	442	490	403
	40031	1,671	1,589	1,613	1,650	1,572	1,541	1,443
	40041	751	680	796	854	797	803	718
	40047	1,023	999	1,018	1,012	996	984	933
	40055	1,618	1,476	1,542	1,594	1,510	1,447	1,377
	40056	1,400	1,355	1,355	1,369	1,321	1,301	1,226
	40059	1,625	1,585	1,545	1,533	1,480	1,486	1,409
	40067	1,746	2,101	1,642	1,584	1,596	1,817	1,581
	40077	1,255	1,155	1,244	1,331	1,285	1,242	1,234
	40108	1,088	1,044	1,056	1,102	1,055	1,041	991
	40109	1,562	1,429	1,488	1,528	1,483	1,398	1,332
	40118	1,070	1,052	1,056	1,053	1,023	1,019	969
	40155	915	864	854	875	887	852	829
	40165	1,168	1,137	1,097	1,101	1,089	1,093	1,038
	40175	1,487	1,381	1,408	1,656	1,531	1,592	1,392
	40177	902	854	901	917	872	874	825
	40202	797	740	749	790	709	672	647
	40203	763	761	757	756	729	732	689
	40204	817	800	769	776	761	771	718
	40205	998	992	939	934	924	945	883
	40206	804	787	764	760	744	760	710
	40207	1,092	1,074	1,039	1,035	1,021	1,030	974
	40208	772	765	757	756	745	771	738
	40209	781	754	764	724	753	778	720
	40210	869	853	855	836	824	830	790
	40211	893	889	869	860	849	857	815
	40212	935	915	902	899	896	902	859
	40213	884	870	864	834	817	834	786
	40214	907	897	868	862	842	851	816
	40215	839	831	804	790	785	803	759
	40216	945	937	901	890	881	898	854
	40217	811	803	790	765	745	764	720
	40218	816	802	799	779	768	772	733
40219	902	893	878	862	849	858	813	
40220	904	897	872	854	845	859	799	
40222	1,174	1,144	1,130	1,136	1,100	1,091	1,012	
40223	1,196	1,170	1,147	1,133	1,099	1,105	1,029	
40228	1,131	1,095	1,088	1,070	1,037	1,031	975	

		<b>Average Annual kWh Usage</b>						
<b>Company</b>	<b>Zip Code</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>LG&amp;E</b>	<b>40229</b>	1,064	1,039	1,003	997	980	981	929
	<b>40241</b>	1,167	1,129	1,108	1,104	1,077	1,081	1,013
	<b>40242</b>	986	971	932	916	901	910	849
	<b>40243</b>	1,032	1,015	990	971	945	953	887
	<b>40245</b>	1,362	1,345	1,300	1,267	1,234	1,247	1,162
	<b>40258</b>	1,023	1,013	979	962	953	973	921
	<b>40272</b>	1,097	1,080	1,040	1,046	1,023	1,029	974
	<b>40291</b>	1,145	1,112	1,112	1,092	1,068	1,063	1,000
	<b>40299</b>	1,133	1,120	1,129	1,094	1,066	1,071	1,001
	<b>LG&amp;E TOTAL</b>		1,034	1,014	996	987	966	973

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Metropolitan Housing Coalition's Second Set of Data Requests**

**Dated February 21, 2018**

**Case No. 2017-00441**

**Question No. 10**

**Witness: David E. Huff / Gregory S. Lawson**

- Q-10. With respect to LG&E's assessment of the cost and benefit of the current EE and DSM programs, and the decision to curtail, continue, or eliminate individual EE or DSM programs for residential customers:
- a. What is LG&E's definition of "cost-effective"?
  - b. Which model or models were used by LG&E to assess the cost effectiveness of its DSM programs, and why was that model or models chosen?
  - c. Please identify and provide the results of any model or models that were used to measure the cost-effectiveness of the individual EE and DSM programs other than those submitted with the application, and provide a comparison of the results of the computations under those models to the modeling results presented in the filing.
  - d. Did LG&E use the Societal Cost Test in any modeling, and if so, please provide the results of that assessment.
  - e. Has LG&E reviewed the recommendations within the report, "Energy Efficiency Cost-Effectiveness Screening," published by the Regulatory Assistance Program in November 2012? If so, has LG&E followed its recommendations?
  - f. Has LG&E reviewed the recommendations within the report, "National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources," published by the National Efficiency Screening Project in May, 2017? If so, has LG&E responded to and incorporated those recommendations in conducting the cost-effectiveness assessments for this filing?
  - g. Was the model used to determine cost-benefit for various DSM measures the California Standard Practice Model?
  - h. Was this the California Standard Practice Model referred to in the 1997 Public Service Commission case, 1997-00083?

- i. What version of the California Standard Practice Model was utilized, and when was the model last updated?
  - j. Please explain the basis for choosing to use the California Standard Practice Model in assessing costs and benefits of various DSM measures.
  - k. Did LG&E use the Avoided Cost Model of 2017 used by the California Public Utilities Commission?
  - l. Did LG&E use the Demand Response currently in use in California, which includes “avoiding the consumption of fossil fuels which can damage the environment”?
  - m. Did LG&E use all the expanded externalities of the 2001 update of the California Standard Practice Model in the area of Total Resource Cost Test?
  - n. Did LG&E use a “Societal Test as described in the updated California Standard Practice Manual. If not, explain why not.
  - o. If so, what is the difference from the Total Resource Cost Test perspective.
  - p. Did LG&E include a definition of self-generation as a type of “demand-side activity” as stated in the 2001 California Standard Practice Model. If so, what was that definition.
  - q. Please explain the factors that have caused LG&E to recommend changes in the current DSM programs from those approved in the last DSM filing.
- A-10. Parts a. – q.: Please see responses to Metropolitan Housing Coalition First Set of Data Requests Question No. 1.