LG&E

a PPL company

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Jeff D. Cline, Manager – Annual Report Branch
Public Service Commission of Kentucky
Filings Division
211 Sower Boulevard
P.O. Box 615
Frankfort, Kentucky 40602-0615

April 2, 2015

Re: Annual Resource Assessment Filing for Louisville Gas and <u>Electric Company Pursuant to Administrative Case No. 387</u>

Dear Mr. Cline:

Enclosed, in accordance with Ordering Paragraph (2) of the Commission's Order in Administrative Case 387, dated October 7, 2005, are an original and five (5) copies of the 2014 Annual Resource Assessment Filing for Louisville Gas and Electric Company, along with a Petition for Confidential Protection regarding certain information provided in response to Item Nos. 11 and 14.

Additionally, in response to your letter dated May 31, 2013, which requested a discussion regarding the consideration given to price elasticity in the forecasted demand, energy, and reserve margin information submitted with the annual Administrative Case No. 2000-387 resource assessments. The discussion is provided following Item No. 14 and results have not changed from last year.

Sincerely,

Robert M. Conroy

Enclosures

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

A REVIEW OF THE ADEQUACY OF	)	
KENTUCKY'S GENERATION CAPACITY	)	ADMINISTRATIVE
AND TRANSMISSION SYSTEM	)	CASE NO. 387

2014 ANNUAL RESOURCE ASSESSMENT FILING
OF
LOUISVILLE GAS AND ELECTRIC COMPANY
PURSUANT TO APPENDIX G
OF THE COMMISSION'S ORDER
DATED DECEMBER 20, 2001
AS AMENDED BY THE
COMMISSION'S ORDER
DATED MARCH 29, 2004

FILED: APRIL 2015

LOUISVILLE GAS AND ELECTRIC COMPANY

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FILED APRIL 2015

ITEM NO. 1

The information originally requested in Item 1 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order

LOUISVILLE GAS AND ELECTRIC COMPANY

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ITEM NO. 2

The information originally requested in Item 2 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order

LOUISVILLE GAS AND ELECTRIC COMPANY

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ITEM NO. 3

RESPONDENT: Greg Lawson/Stuart Wilson

3. Actual and weather-normalized monthly coincident peak demands for the just completed calendar year Demands should be disaggregated into (a) native load demand (firm and non-firm) and (b) off-system demand (firm and non-firm)

Response

Please refer to the attached Table LGE-3, which shows the actual and weather-normalized native LG&E peak demands. The normalized native LG&E stand-alone peak demands are available only on a seasonal (summer/winter) basis.

TABLE LGE-3
NATIVE AND OFF-SYSTEM DEMANDS (MW) BY MONTH FOR 2014

Louisville Gas & Electric Co.

	Actual			Normal Weather (Seasonal)	Off-System (1)		
Time of Monthly Native Peak	Native Peak	Non-Firm	Firm	Native Peak	Firm	Non-Firm	Total
1/6/2014 19 00	2,096	0	2,096	2,042	0	487	487
2/7/2014 8 00	1,835	0	1,835		0	352	352
3/3/2014 20 00	1,710	0	1,710		0	601	601
4/29/2014 15 00	1,476	0	1,476		0	3	3
5/27/2014 16 00	2,155	0	2,155		0	225	225
6/19/2014 16.00	2,481	0	2,481	2,441	0	0	0
7/22/2014 18 00	2,446	0	2,446		0	0	0
8/27/2014 14 00	2,466	0	2,466		0	103	103
9/4/2014 16 00	2,424	0	2,424		0	150	150
10/2/2014 16 00	1,985	0	1,985		0	0	0
11/18/2014 19:00	1,780	0	1,780		0	207	207
12/17/2014 19·00	1,682	0	1,682		0	1	1

Notes

(1) The allocation of off-system sales split between LG&E and KU is handled in the After-the-Fact Billing ("AFB") process in accordance with the Power Supply System Agreement between LG&E and KU The individual company sales will include an allocation of the sales sourced with purchased power and allocated to the individual company based on each company's contribution to off-system sales

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ITEM NO. 4

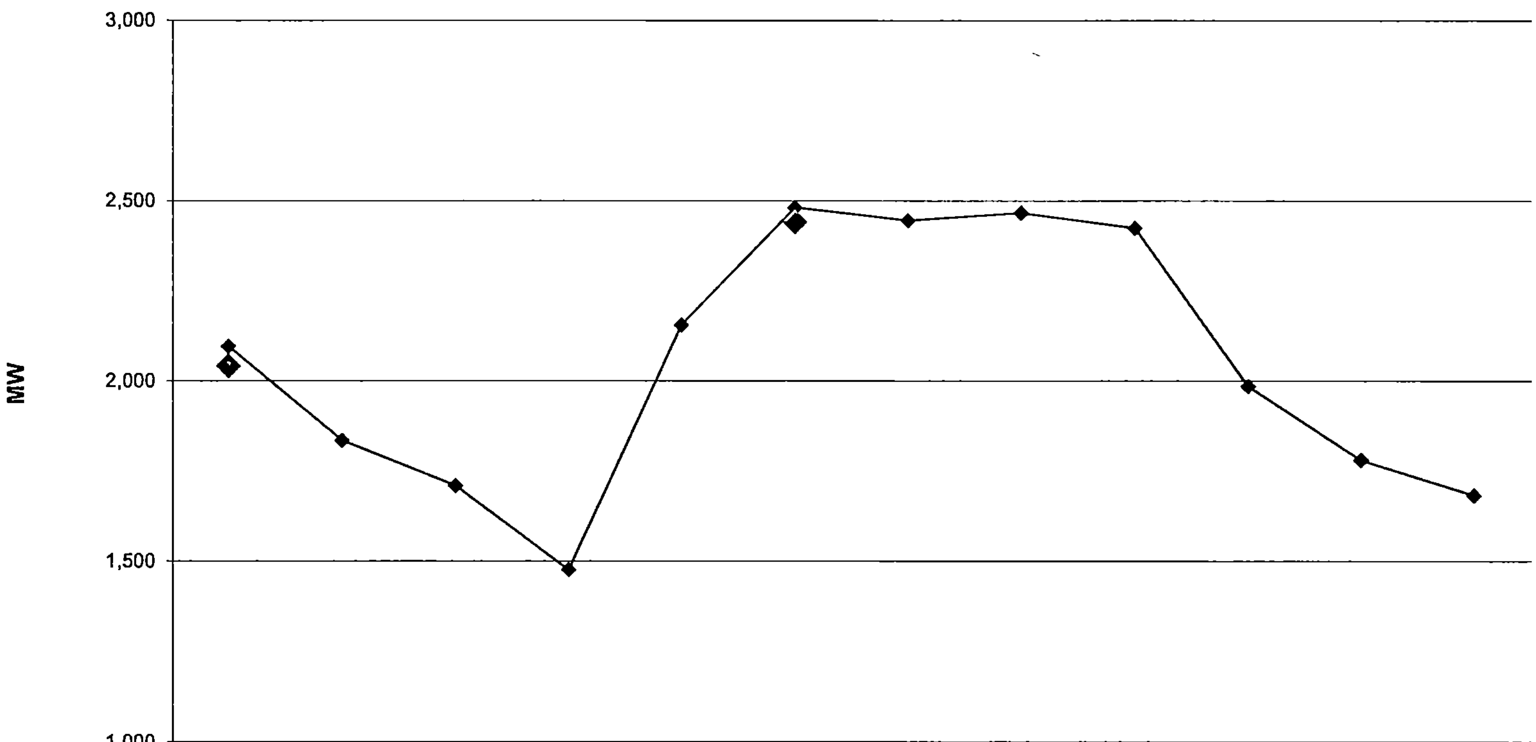
RESPONDENT: Greg Lawson

4 Load shape curves that show actual peak demands and weather-normalized peak demands (native load demand and total demand) on a monthly basis for the just completed calendar year.

Response

Please refer to the attached Figure LGE-4.

LG&E 2014
Actual and Weather Normalized Seasonal Peak



	1	2	3	4	5	6	7	8	9	10	11	12
Actual	2,096	1,835	1,710	1,476	2,155	2,481	2,446	2,466	2,424	1,985	1,780	1,682
WN	2,042					2,441						

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ITEM NO. 5

The information originally requested in Item 5 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.

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ITEM NO. 6

RESPONDENT: Greg Lawson/Stuart Wilson

6 Based on the most recent demand forecast, the base case demand and energy forecasts and high case demand and energy forecasts for the current year and the following four years The information should be disaggregated into (a) native load (firm and non-firm demand) and (b) off-system load (both firm and non-firm demand).

Response:

a) Please see the attached Table LGE-6a. The values in Table LGE-6a reflect the impact of the Companies' Energy Efficiency programs.

b) Off-system sales ("OSS") projections for 2015-2019 contained in the attached Table LGE-6b are based on the combined Companies' current plan For OSS, only base case total sales energy projections exist for 2015-2019 The projections consist of the expected market sales, dubbed "Wholesale OSS" All OSS are non-firm.

Table LGE-6a

Louisville Gas & Electric

	2015	2016	2017	2018	2019
Base Case Energy Sales (GWh)	11,978	12,090	12,211	12,330	12,436
High Case Energy Sales (GWh)	12,395	12,497	12,621	12,755	12,889
Base Case Energy Requirements (GWh)	12,673	12,791	12,921	13,043	13,155
High Case Energy Requirements (GWh)	13,113	13,222	13,354	13,493	13,634
Base Case Native Peak Demand (MW)	2,750	2,783	2,815	2,841	2,824
High Case Native Peak Demand (MW)	2,846	2,876	2,910	2,939	2,927

Table LGE-6b
Combined Companies
Total Base Case Off-System Sales Energy Projection

	2015	2016	2017	2018	2019
Existing OSS (GWh)	0	0	0	0	0
Wholesale OSS (GWh)	311	352	294	242	290
Total OSS (GWh)	311	352	294	242	290

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ITEM NO. 7

RESPONDENT: Stuart Wilson

7. The target reserve margin currently used for planning purposes, stated as a percentage of demand. If changed from what was in use in 2001, include a detailed explanation for the change.

Response:

As part of the 2014 Integrated Resource Plan ("2014 IRP"), the Companies established an optimal reserve margin range of 16% to 21%, with 16% used for planning purposes The range provides an optimum level of reliability through various system operating conditions. The 2014 IRP was filed with the Commission in April 2014

A detailed explanation of the current target reserve margin is documented in the report titled, "2014 Reserve Margin Study," included in Volume III of the Companies' 2014 IRP

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ITEM NO. 8

RESPONDENT: Stuart Wilson

8. Projected reserve margins stated in megawatts and as a percentage of demand for the current year and the following 4 years Identify projected deficits and current plans for addressing these. For each year identify the level of firm capacity purchases projected to meet native load demand

Response

Please refer to the attached Table LGE-8 The Companies will monitor load requirements and evaluate supply alternatives to address the capacity deficit in 2018

Table LGE-8
Combined Companies
Reserve Margin Needs (MW)

Current Values	2015	2016	2017	2018	2019
Peak Load	7,308	7,403	7,502	7,602	7,387
DSM at Peak Hour	-366	-407	-444	-481	-490
CSR/Interrupt	-145	-145	-133	-133	-133
Net Load*	6,797	6,851	6,925	6,988	6,764
Existing Capability	7,296	7,124	7,126	7,126	7,126
New Capacity (Cane Run 7, Brown Solar)	640	640	649	649	649
Bluegrass Capacity Purchase and Tolling Agreement	165	165	165	165	0
OVEC	152	152	152	152	152
Total Supply	8,253	8,081	8,092	8,092	7,927
MW Margin	1,456	1,230	1,167	1,104	1,163
Reserve Margin %	21.4%	18.0%	16.9%	15.8%	17.2%
Capacity Need for 16%	(368)	(134)	(59)	14	(81)

*Sum of individual values may not match totals due to rounding

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ITEM NO. 9

The information originally requested in Item 9 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order

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ITEM NO. 10

The information originally requested in Item 10 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.

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ITEM NO. 11

RESPONDENT: Stuart Wilson

11. A list that identifies scheduled outages or retirements of generating capacity during the current year and the following four years

Response

The planned maintenance outage schedule for 2015 through 2019 is being provided pursuant to a Petition for Confidential Protection. The schedule is regularly modified based on actual operating conditions, forced outages, changes in the schedule required to meet environmental compliance regulations, fluctuations in wholesale prices, and other unforeseen events

Cane Run 4, 5, and 6 will be retired upon the commissioning of Cane Run 7, which is scheduled for May 2015.

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ITEM NO. 12

RESPONDENT: Stuart Wilson

12. Identify all planned base load or peaking capacity additions to meet native load requirements over the next 10 years Show the expected in-service date, size and site for all planned additions. Include additions planned by the utility, as well as those by affiliates, if constructed in Kentucky or intended to meet load in Kentucky.

Response:

Please refer to the attached Table LGE-12 The Companies jointly plan their generation portfolio.

Table LGE-12
Combined Companies
Planned Capacity Additions (2015-2024)

In Service/ Acquisition Date	Type	Site	Summer Net Capacity (MW)	Winter Net Capacity (MW)
May 2015	2x1 Combined Cycle Combustion Turbine	Cane Run (Jefferson Co, KY)	640	652
May 2015 thru April 2019	Bluegrass Agreement	Bluegrass (Oldham Co, KY)	165	165
December 2016	Solar Photovoltaic ("PV")	E W Brown (Mercer Co, KY)	9	9
2021*	2x1 Combined Cycle Combustion Turbine	Undecided	670	657

*Potential addition based on 2014 IRP updated with Companies' current load forecast Companies will continue to monitor development of customers' capacity and energy requirements

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ITEM NO. 13

RESPONDENT: Derek Rahn

13. The following transmission energy data for the just completed calendar year and the forecast for the current year and the following four years

  a Total energy received from all interconnections and generation sources connected to the transmission system

  b. Total energy delivered to all interconnections on the transmission system

  c Peak load capacity of the transmission system

  d Peak demand for summer and winter seasons on the transmission system

Response

Data exists for 2014 The Company does not forecast this type of data; therefore no forecast exists for 2014-2017.

a LG&E and KU operate as a single NERC Control area that contains several generators not owned by LG&E and KU; the non-Company owned facilities are also included as sources below:

Tie Lines Received (MWh)	17,701,906
Net Generation-LG&E (MWh)	16,308,155
Net Generation-KU (MWh)	20,380,052
Net Received from OMU (MWh)	2,510,744
Net Generation-IPPs (MWh)	6
Total Sources (MWh)	56,900,863

b LG&E and KU operate as a single Control Area, the amount of energy delivered at the interconnections of the single Control area were 19,910,641 MWh

c. There is no set number for peak load capacity for the transmission system. The system is built to support Network Service and firm PTP customers as tested under the LGE/KU Transmission Planning Guidelines. Actual transmission capacity available for Network customers, import, export or thru-flow will vary depending on which facilities (generation, load or transmission) in the interconnected transmission system of the eastern interconnect are connected and operated at any given time

d. The maximum summer peak transmission load for the combined LG&E/KU transmission system was 6,623 MW for the peak hour of 7/22/14 at 4 PM.

   The maximum winter peak transmission load for the combined LG&E/KU transmission system was 7,371 MW for the peak hour of 1/6/14 at 7 PM.

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ITEM NO. 14

RESPONDENT: Delyn Kilpack

14. Identify all planned transmission capacity additions for the next 10 years. Include the expected in-service date, size and site for all planned additions and identify the transmission need each addition is intended to address.

Response

The response to this item is being provided pursuant to a Petition for Confidential Protection.

Discussion Regarding the Consideration Given to Price Elasticity in the Forecasted Demand, Energy and Reserve Margin Information Provided with Annual Resource Assessment Filings 2015

Price elasticity of demand is a direct input into the Louisville Gas and Electric Company and Kentucky Utilities Company (collectively "the Companies") Residential and General Service (small commercial) forecast models These models use Itron's Statistically Adjusted End Use ("SAE") Models. The elasticity coefficients used in the SAE models are applicable to shorter-term forecasting (up to 10 years). Over the longer-term, the implied elasticity estimate increases (in absolute value) in the SAE models due to improvements in the efficiencies and saturations of appliances and other equipment to appropriately adjust demand

In developing the elasticity coefficients, the Companies have consulted multiple sources to better understand how customers respond to electricity prices. These sources include ITRON, available studies[1], and our small commercial customers. The Companies' price elasticity of demand coefficients are consistent with the ranges cited in the studies

Currently, the Companies use an elasticity coefficient of -0.1 for the Residential forecast. Below, the residential price elasticity of demand is applied in a simple example to determine the impact on customer usage for a hypothetical customer, price, and price increase.

<u>Inputs</u>
Electricity Price $0 08/kWh
Monthly customer usage: 1,000 kWh
Price increase 5%
Price Elasticity of demand. -0.1

<u>Formula</u>
(price elasticity of demand) = (% change in quantity demanded) / (% change in price)
Restated as:
(% change in quantity demanded) = (% change in price) x (price elasticity of demand)

<u>Results</u>
Completing the equation based on the inputs above.
(% change in quantity demanded) = (.05) x (-0.1) = -0 005 = -0 5%
Therefore, the revised monthly customer usage is 0 5% less than 1,000 kWh, or 995 kWh per month.

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[1] "Regional Differences in the Price-Elasticity of Demand for Energy" by M A Bernstein and J Griffin, RAND Corporation for NREL (2006), "Price Responsiveness in the AEO2003 NEMS Residential and Commercial Buildings Sector Models" by S Wade, Energy Information Administration (2005), "Price Elasticity of Demand for Electricity A Primer and Synthesis" by B Neenan, EPRI (2007), "A Global Survey of Electricity Demand Elasticities" by C Dahl was presented at the 34th IAEE International Conference Institutions, Efficiency, and Evolving Energy Technologies in June 2011 at the Stockholm School of Economics in Sweden

For small commercial customers, the Companies currently use a price elasticity of demand of -0.05. The Companies' discussions with small commercial customers indicate that these customers will attempt to pass along higher costs for electricity in the price of their goods and services These customers typically noted that they have few options for changing their use of energy after upgrading lighting and climate control to increase efficiency

The Companies' forecasts for Large Commercial and Industrial customers also consider how customers respond to energy prices, but these forecasts do not use the SAE models to incorporate explicit price elasticity of demand coefficients. Instead, the Companies' forecast the largest customers' energy and demand on an individual basis and use specific industry indices for others. Recognizing that customers may respond to price through efficiency measures or other operational changes, these individual forecasts and indices inherently reflect the expected changes in customers' energy use due to economic inputs, including the price of electricity. The Companies recognize that larger commercial and industrial customers may not display a smooth reduction in usage as prices rise. Over the longer-term, in extreme cases, some large energy intensive customers may even cease operations or relocate upon reaching certain energy price points