COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of the Application of Louisville Gas & Electric Company for an Adjustment of Its Electric Rates and for Certificates of Public Convenience and Necessity	**Case No. 2016-00371**

DIRECT TESTIMONY OF JONATHAN WALLACH ON BEHALF OF SIERRA CLUB AND AMY WATERS

Resource Insight, Inc.

MARCH 3, 2017

TABLE OF CONTENTS

TABLE OF EXHIBITS

I. INTRODUCTION AND SUMMARY

Q: Please state your name, occupation, and business address.

A: My name is Jonathan F. Wallach. I am Vice President of Resource Insight, Inc., 5 Water Street, Arlington, Massachusetts.

Q: Please summarize your professional experience.

A: I have worked as a consultant to the electric power industry since 1981. From 1981 to 1986, I was a research associate at Energy Systems Research Group. In 1987 and 1988, I was an independent consultant. From 1989 to 1990, I was a senior analyst at Komanoff Energy Associates. I have been in my current position at Resource Insight since September of 1990.

Over the past four decades, I have advised and testified on behalf of clients on a wide range of economic, planning, and policy issues relating to the regulation of electric utilities, including: electric-utility restructuring; wholesale-power market design and operations; transmission pricing and policy; market-price forecasting; market valuation of generating assets and purchase contracts; power-procurement strategies; risk assessment and mitigation; integrated resource planning; mergers and acquisitions; cost allocation and rate design; and energy-efficiency program design and planning.

My resume is attached as Exhibit JFW-1.

Q: Have you testified previously in utility proceedings?

A: Yes. I have sponsored expert testimony in more than eighty state, provincial, and federal proceedings in the U.S. and Canada. Exhibit JFW-1 provides a detailed list of my previous testimony.

Q: On whose behalf are you testifying in this proceeding?

A: I am testifying on the behalf of the Sierra Club and Amy Waters.

Q: What is the purpose of your testimony?

A: On November 23, 2016, Louisville Gas and Electric Company (LG&E or "the Company") filed an application (including supporting testimony) for authority to adjust its electric rates and for certificates of public convenience and necessity. My testimony addresses the following aspects of the Company's filing:

- The Company's proposal to increase the monthly residential basic service charge from $10.75 to $22.00.
- The Company's proposal to separate the residential energy rate into fixed and variable cost components.

Both of these proposals are supported in pre-filed direct testimony by Company witnesses Robert M. Conroy and William Steven Seelye.

Q: Please summarize your findings and recommendations.

A: The Company lacks a reasonable basis for its proposal to increase the basic service charge. The proposed increase would inappropriately shift load-related costs to the basic service charge, dampen price signals to consumers for reducing energy usage, disproportionately and inequitably increase bills for the Company's lowest-usage residential customers, and exacerbate the subsidization of larger residential customers' costs by those lower-usage customers. Consequently, the Commission should reject the Company's proposal to increase the monthly basic service charge to $22.00 and instead

find that it is reasonable to maintain the monthly charge at its current level of $10.75.

The Company also proposes to separate the residential energy rate into "fixed" and "variable" cost components on its tariff for informational and educational purposes. The Commission should reject the Company's proposal since it will only serve to confuse and misinform ratepayers regarding the distinction between fixed and variable costs recovered through the residential energy rate and regarding the rationale for recovering such costs separately.

My recommendations regarding both of these proposals are intended to promote rate designs that provide revenue adequacy, reasonably mitigate intra-class subsidies, and, in accordance with the Commission's longstanding ratemaking standards, promote efficient behavior with appropriate price signals for conservation in order to avoid unnecessary costs being imposed on ratepayers:

> For over 30 years, the Commission has historically noted the importance of energy efficiency (conservation) as a ratemaking standard. "It is intended to minimize the 'wasteful' consumption of electricity and to prevent consumption of scarce resources…."
>
> [W]ith the potential for huge increases in the costs of generation and transmission as a result of aging infrastructure, low natural gas prices, and stricter environmental requirements, we will strive to avoid taking actions that might disincent energy efficiency.[1]

[1] In re Applic. of Ky. Utils. Co. for an Adjustment of Its Elec. Rates, Case No. 2012-00221, Order (Dec. 20, 2012), at 7, 11 (internal citations omitted).

Indeed, the Commission's focus on energy efficiency and conversation has sharpened over time, consistent with "the Commission's belief that greater attention to energy efficiency is important."[2]

II. RESIDENTIAL BASIC SERVICE CHARGE

Q: What is the Company's proposal with respect to the basic service charge for residential customers?

A: The Company proposes to more than double the monthly basic service charge for residential customers from $10.75 to $22.00. Company witness Conroy contends that the Company's proposal would result in a basic service charge that better reflects the fixed customer-related cost to serve a residential customer, as indicated by the results of the Company's cost of service study (COSS). Mr. Conroy notes that the COSS estimates a customer-related cost for the residential class of $22.04 per customer per month, which means that the proposed basic service charge would recover all of the embedded costs classified as customer-related and allocated to the residential class in the Company's COSS.

Q: What costs are classified as customer-related in the Company's COSS?

A: According to Company witness Seelye, the cost of meters, service drops, and all customer services are deemed to be customer-related in the Company's

[2] In re Applic. of Blue Grass Energy Coop. Corp. for an Adjustment of Rates, Case No. 2014-00339, Order (May 29, 2015), at 7; *see also* In re Applic. of Big Rivers Elec. Corp. for an Adjustment of Rates, Case No. 2012-00535, Order (Oct. 29, 2013), at 53 ("[A]s we have stated in many other orders … "EE/DSM and conservation have become more important."); In re 2012 Integrated Res. Plan of E. Ky. Pwr. Coop., Inc., Case No. 2012-00149, Staff Report (Sept. 26, 2013), at 30 (encouraging utility "to further educate and encourage [stakeholders] about the importance of DSM, energy efficiency, and energy conservation").

COSS. In addition, the COSS classifies a portion of pole, conductor, and secondary transformer costs as customer-related, based on the results of a zero-intercept analysis of such distribution plant costs.

Q: Why does LG&E want to move the residential basic service charge to the COSS estimate of customer-related costs?

A: Mr. Seelye claims that the COSS estimate of customer-related costs, on a per-customer basis, represents the minimum monthly cost to provide a residential customer access to electric service no matter how much energy that customer uses in a month.[3] Mr. Seelye further asserts that any amount of that customer-related cost recovered through the energy charge represents a subsidy payment from above-average to below-average usage customers.[4] Thus, the Company's proposal to increase the basic service charge from $10.75 to $22.00 would remove all of the customer-related costs from the energy charge and thereby eliminate the alleged subsidy payment from above-average to below-average customers.[5]

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[3] Direct Testimony William Steven Seelye, Case No. 2016-00371, November 23, 2016, p. 21, ll. 10-16. Mr. Seelye also refers to customer-related costs as "non-volumetric fixed costs."

[4] To the extent that non-volumetric fixed costs are recovered through energy rates, a low-usage customer will contribute a smaller share toward recovery of such costs than a larger residential customer. Conversely, to the extent that volumetric costs are recovered through the basic service charge, a low-usage customer will contribute a larger share toward recovery of such costs than a larger residential customer.

[5] Company witness Conroy also notes that increasing the basic service charge might reduce spikes in monthly bills. However, concerns regarding monthly bill volatility could be addressed simply by encouraging customers to sign up for budget billing under the Company's Budget Payment Plan and by offering cost-effective demand-side management programs targeting weather-related loads. In any event, customers experiencing financial hardship from periodically high bills—who tend to be lower-income consumers—would not likely find

Q: Do you agree with Mr. Seelye's claim that increasing the basic service charge would reduce subsidization of low-usage customers by larger residential customers?

A: No. To the contrary, I conclude from a review of the Company's COSS that customers with above-average usage are currently being subsidized by low-usage customers. Thus, the Company's proposal would actually exacerbate intra-class subsidization and diminish rate affordability for smaller customers by shifting load-related costs inappropriately from high-usage to low-usage customers.

Specifically, I find that the Company overstates the minimum cost to serve a residential customer because it relies on the results of a zero-intercept analysis to derive its estimate of the minimum cost *per customer*. As discussed below, it is not appropriate to rely on the results of zero-intercept analyses for the purposes of estimating a *per-customer* minimum cost, since such analyses typically overstate the true minimum cost *per customer* for distribution plant. Correcting for this overstatement, I find that the minimum cost to serve a residential customer is less than the amount currently being recovered through the basic service charge, which indicates that low-usage customers are currently subsidizing high-usage customers.

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reprieve in an overall rate hike that smooths out billing periods by way of raising each of their monthly bills to varying degrees. In other words, consistently higher monthly bills are not made more palatable to vulnerable households simply because those bills are more uniform in their costliness.

Q: Please describe the Company's zero-intercept analysis of pole, conductor, and line-transformer costs.

A: In order to allocate the cost of its existing distribution plant to customer classes, the Company must first separate such plant costs into customer-related and demand-related portions. Those plant costs classified as customer-related can then be allocated to classes in proportion to the number of customers in each class, while those costs classified as demand-related can be allocated in proportion to class demand.

The Company's zero-intercept analysis determines the customer-related portion of distribution plant cost by estimating the "minimum" cost of the Company's existing distribution equipment, i.e., what the cost of all of the Company's existing poles, conductors or line transformers would be if those conductors or transformers were sized to carry zero load. In the Company's COSS, the "minimum" cost of the distribution system (as determined by the zero-intercept analysis) is classified as customer-related and then allocated to customer classes in proportion to the number of customers in each class.

The zero-intercept method derives the minimum cost of the existing distribution system by estimating what it would cost in theory to replicate the configuration of the existing distribution system (i.e., assuming the same number of poles, conductor-feet, and transformers) with equipment that did not have to carry any load. The zero-intercept approach derives the cost of this hypothetical zero-load equipment by estimating a functional relationship between equipment cost and equipment size based on the current system, and then extrapolating that cost function to estimate the cost of equipment that carries zero load (e.g., zero-kVA transformers), the smallest units legally

allowed (e.g., 25-foot poles), or the smallest units physically feasible (e.g., the thinnest conductors that will support their own weight in overhead spans).

Q: Is it appropriate to rely on the results of a zero-intercept analysis to estimate the minimum cost to connect a residential customer?

A: No. As noted above, the purpose of a zero-intercept analysis is to determine the portion of distribution plant costs that are reasonably allocated to customer classes based on the number of customers in each class. The Company has not offered any evidence that zero-intercept analyses also yield reliable estimates of the minimum cost to connect an individual customer.

To the contrary, zero-intercept analyses overstate the minimum cost *per customer* because they assume that a minimum system carrying zero load would have the same number of poles, conductor-feet, and transformers as currently installed in a distribution system designed to carry actual distribution load. In other words, the zero-intercept method assumes that each piece of distribution equipment would serve the same number of customers on average, regardless of whether the customers are average-sized (as for the actual system) or have zero demand (as for the hypothetical minimum system.)

This is not a realistic assumption, since even a minimally sized piece of distribution equipment should be able to serve more minimal-demand customers than the number of average-demand customers served by average-sized distribution equipment. Consequently, the true minimum cost to serve a customer with minimal usage is likely to be less than the customer-related cost per customer derived using a zero-intercept analysis. Indeed, since the zero-intercept method estimates the minimum cost for hypothetical equipment that serves zero load, the true minimum plant cost *per customer*

must be zero because distribution equipment that carries zero load can serve an infinite number of customers with zero load.

Q: Have you estimated the true minimum cost to serve one of the Company's residential customers?

A: Yes. As noted above, the Company considers the minimum cost to serve a residential customer to include the cost per customer of meters, service drops, customer services, and the customer-related portion of pole, conductor, and transformer plant costs. However, since the true minimum cost of the Company's poles, conductors, and secondary transformers per customer is zero under a zero-intercept analysis, I derived the minimum cost to connect a residential customer based on the costs per residential customer of service drops, meters, meter-reading, billing, and other customer-service expenses.

Based on the calculations in Exhibit WSS-2, I estimate a minimum connection cost of $8.01 per customer per month.[6] As indicated in Exhibit JFW-2, the total minimum connection cost breaks down to $3.70 for customer-related distribution costs and $4.31 for customer-service expenses.[7]

[6] The spreadsheet version of Exhibit WSS-2 is part of the Company's COSS spreadsheet model. The COSS model was provided in response to Commission Staff Data Request No. 1-53.

[7] The only change I made to the calculations in Exhibit WSS-2 was to exclude the customer-related portions of pole, conductor, and transformer costs from the calculation of customer-related distribution cost. I adopted all other input assumptions and calculations in Exhibit WSS-2 for the purposes of deriving Exhibit JFW-2.

Thus, a monthly residential basic service charge of $22.00, as proposed by the Company, would overstate the minimum connection cost by more than a factor of two.

Q: What does this result tell us about cost subsidization within the residential class?

A: The fact that the current basic service charge exceeds the minimum connection cost indicates that volumetric costs are also being recovered through the current charge. This means that residential customers with below-average usage currently bear a disproportionate share of volumetric costs and consequently subsidize larger customers under current rates, not the other way around as Mr. Seelye contends.

Q: How would a change in the basic service charge affect cost subsidization within the residential class?

A: Since the current basic service charge already exceeds the minimum cost to serve a residential customer, increasing the charge would exacerbate the subsidization of high-usage customers' costs by low-usage customers. Decreasing the basic service charge, on the other hand, would reduce the subsidy payment from low-usage to high-usage residential customers.

Consequently, if the Commission opts to address subsidies within the residential customer class, my estimate of the minimum connection cost suggests that a *reduction* – not an increase – in the basic service charge would be warranted to mitigate subsidization of high-usage customers' costs by low-usage customers.

Q: Besides exacerbating subsidization of high-usage customers by low-usage customers, would the Company's proposal to increase the basic service charge have any other adverse effects?

A: Yes. The difference between the Company's proposed basic service charge and the minimum cost to serve residential customers represents usage-related costs. Thus, the Company's proposal to increase the residential basic service charge would shift recovery of costs to the basic service charge that are more appropriately recovered through the energy charge. Such a cost shift would dampen price signals and discourage economically efficient conservation and investments in distributed generation by residential customers.

Q: How should residential energy and basic service charges be set in order to provide appropriate price signals and encourage conservation?

A: Energy charges should be set at levels that recover costs that tend to increase with customer usage. This includes costs directly driven by customer usage, such as generation, transmission, substations, and distribution conductor sizing and number. Energy charges should also include costs that tend to rise with customer usage level but are not directly caused by customer usage. Examples of this latter category might include bad debt, the costs associated with adding line transformers to avoid long runs of secondary conductor with high loads, or the additional distribution costs between very large suburban homes, as opposed to closely packed urban duplexes or apartments.

In contrast, the basic service charge is intended to reflect the incremental costs imposed by the continued presence of a customer who uses very little energy. Thus, the basic service charge should not be expected to cover all customer-related costs for the average residential customer, but only

the incremental cost to connect one more very small customer.[8] Since the Company would typically not need to add secondary conductor or a transformer to connect a very small customer, incremental connection costs would be limited to installation and maintenance costs for a service drop and meter, along with meter-reading, billing, and other customer-service expenses.[9]

Q: What is the incremental cost to connect a residential customer in the Company's service territory?

A: The per-customer minimum connection cost described above reflects the incremental cost to connect one more very small customer. Thus, I estimate an incremental cost of $8.01 per customer per month.

The $22.00 basic service charge proposed by LG&E overstates my estimated incremental connection cost by more than 100%. The excess over incremental connection cost represents usage-related costs that would be recovered through the basic service charge under the Company's proposal. Thus, the Company's proposal to increase the residential basic service charge would dampen price signals by inappropriately shifting recovery of usage-related costs from the energy charge to the basic service charge.

[8] *See, e.g.*, Jim Lazar & Wilson Gonzalez, *Smart Rate Design for a Smart Future*, Regulatory Assistance Project, 36 (July 2015).

[9] Remote residences might also require a line extension and a small transformer in order to connect to the distribution system. On the other hand, customers located in a multi-family building would probably not require their own service drop.

Q: How does the proposed increase to the basic service charge affect the residential energy rate?

A: With the basic service charge set at $22.00, LG&E proposes to decrease the energy rate to 8.471¢/kWh in order to recover the test-year revenue requirement allocated to the residential class. If, instead, the basic service charge remained at its current rate of $10.75, the energy rate would have to be increased to 9.647¢/kWh to recover the same allocated revenue requirement.[10] Thus, the energy rate under the Company's proposal to more than double the basic service charge would be 1.18¢/kWh, or about 12%, less than the energy charge without the proposed increase to the basic service charge.

Q: To what extent would the lower energy charge under the Company's proposal for the basic service charge dampen price signals for conservation?

A: Residential customers respond to the price incentives created by the electrical rate structure. Those responses are generally measured as price elasticities, i.e., the ratio of the percentage change in consumption to the percentage change in price. Price elasticities are generally low in the short term and rise over several years, because customers have more options for increasing or reducing energy usage in the medium to long term. For example, a review by Espey and Espey (2004) of thirty-six articles on residential electricity demand published between 1971 and 2000 reports short-run average-rate

[10] Company Response to Sierra Club First Data Request No. 5.

elasticity estimates of about −0.35 on average across studies and long-run average-rate elasticity estimates of about −0.85 on average across studies.[11]

Studies of electric price response typically examine the change in usage as a function of changes in the marginal rate paid by the customer.[12] Table 1 lists the results of seven studies of marginal-price elasticity over the last forty years.[13]

Table 1: Summary of Marginal-Price Elasticities

Authors	Date	Elasticity Estimates
Acton, Bridger, and Mowill	1976	−0.35 to −0.7
McFadden, Puig, and Kirshner	1977	−0.25 without electric space heat and −0.52 with space heat
Barnes, Gillingham, and Hageman	1981	−0.55
Henson	1984	–0.27 to –0.30
Reiss and White	2005	−0.39
Xcel Energy Colorado	2012	–0.3 (at years 2 and 3)
Orans et al, on BC Hydro inclining-block rate	2014	–0.13 in 3rd year of phased-in rate

Q: What would be a reasonable estimate of the marginal-price elasticity for changes in the residential energy rate?

A: From Table 1, it appears that –0.3 would be a reasonable mid-range estimate of the effect over a few years.

[11] In other words, on average across these studies, consumption decreased by 0.35% in the short term and by 0.85% in the long term for every 1% increase in average rates. The citation for this study is provided in Exhibit JFW-3.

[12] For the Company, that would be the energy rate.

[13] The citations for these studies are provided in Exhibit JFW-3.

Q: What would be a reasonable estimate of the effect on energy use from the 12% reduction to the residential energy rate under the Company's proposal to increase the basic service charge?

A: An elasticity of –0.3 and a 12% reduction in energy price would result in a 3.6% increase in energy consumption. This means that all else equal, residential load would be expected to increase by 3.6% over a several-year period as a result of implementing the Company's proposed basic service charge increase, rather than recovering the additional revenue requirement through energy charges.

For comparison, LG&E and Kentucky Utilities project that each year's installations under their Residential Incentives energy-efficiency program will save about 0.2% of their combined residential load.[14] Consequently, the consumption increase due to the Company's proposed increase in its basic service charge (and the resulting decrease in the energy charge) would undo about eighteen years of savings from the Residential Incentives program.

Q: What do you recommend with regard to the Company's proposal to increase the residential basic service charge?

A: The Company's proposal would inappropriately shift load-related costs from the energy charge to the basic service charge, dampen price signals to consumers for reducing energy usage, disproportionately and inequitably increase bills for the Company's smallest residential customers, and exacerbate the subsidization of larger residential customers' costs by customers with below-average usage. Consequently, the Commission should

[14] 2014 Joint Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company, Vol. 1.

reject the Company's proposal to increase the monthly basic service charge to $22.00 and instead find that it is reasonable to maintain the monthly charge at its current level of $10.75.

III. FIXED AND VARIABLE ENERGY RATES

Q: What does the Company propose with regard to the design of the residential energy rate?

A: The Company proposes to split the residential energy rate into "fixed" and "variable" cost components on its tariff for informational and educational purposes. The fixed cost component (Infrastructure Energy Charge) would purport to recover all demand-related generation, transmission, and distribution costs allocated to the residential class. The variable cost component (Variable Energy Charge) would purport to recover all energy-related costs allocated to the residential class.[15]

According to Mr. Seelye, the Company proposes this design for the residential energy rate because:

> As greater emphasis is placed on distributed generation and energy conservation in our society, it is important for customers, stakeholders and utility employees to understand the distinction between fixed and variable costs.[16]

[15] As discussed above in Section II, the Company proposes to recover almost all customer-related costs (including minimum distribution plant costs) allocated to the residential class through the residential basic service charge.

[16] Seelye Testimony, p. 11, ll. 19-22.

Q: What is the Company's understanding of "the distinction between fixed and variable costs" recovered through the energy rate?

A: Company witness Conroy appears to have a different understanding of this distinction than Company witness Seelye.

According to Mr. Conroy, the "fixed" costs recovered through the energy rate are those costs that vary with customer demand (however measured) regardless of energy usage, whereas the "variable" costs recovered through the energy rate consists of those costs that vary with energy usage regardless of demand.[17] In other words, Mr. Conroy considers a portion of the costs recovered through the energy rate to be "fixed" in the sense that they do not vary with energy usage, but do vary with demand.[18]

In contrast, Mr. Seelye contends that the "fixed" costs recovered through the energy rate do not vary with either customer demand or energy usage, whereas the "variable" costs recovered through the energy rate vary with energy usage.[19]

It is not clear whose understanding of the "distinction between fixed and variable costs" – Mr. Conroy's or Mr. Seelye's – the Company intends to convey to customers with its proposal to split the residential energy rate into fixed and variable cost components.

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[17] Testimony Robert M. Conroy, Case No. 2016-00371, November 23, 2016, p. 14, ll. 6-18.

[18] "Fixed" as used here, in the context of the proposed components of the energy rate, is to be distinguished from "fixed" customer-related costs to be recovered through the basic service charge under the Company's proposal, which Mr. Conroy asserts do not vary with either demand or energy usage.

[19] Company Response to Sierra Club First Data Request No. 8.

Q: Why does the Company want to educate customers about the distinction between the fixed and variable costs recovered through the residential energy rate?

A: According to Mr. Conroy, the Company believes that educating customers about this distinction will provide "a better understanding of intra-class subsidies."[20] Specifically, the Company believes that customers with above-average energy usage will pay more than their fair share of the residential class's demand-related costs (and low-usage customers will pay less than their fair share) whenever demand-related costs are recovered through energy rates.

Q: How likely is it that the recovery of demand-related costs through the residential energy rate would result in any significant subsidization of low-usage customers' demand-related costs by high usage-customers?

A: It seems unlikely that there would be subsidization to any notable degree or at all, since subsidization would occur only to the extent that (i) the percentage difference between the average *usage* for high-usage customers and for all customers exceeds (ii) the percentage difference between average *demand* for those same high-usage customers and for all customers. In other words, subsidization of low-usage customers would arise only if, and to the extent that, the average load factor for high-usage customers exceeds that for the residential class as a whole.[21]

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[20] Conroy Testimony, p. 16, line 4.

[21] Load factor is defined as the ratio of average hourly demand to peak hourly demand. For example, if the average residential customer consumes 12,000 kWh per year and has a peak demand of 4 kW, then the average load factor for the residential class would be equal to 12,000 kWh / 8,760 hours per year / 4 kW, or about 34%.

There is no reason to expect that customers with above-average usage would have a higher load factor on average than customers with below-average usage. To the contrary, it seems more likely that high-usage customers would have below-average load factors if their higher usage were driven by central air-conditioning or electric space heat load. In this case, low-usage customers would be subsidizing high-usage customers' demand-related costs, not the other way around as Mr. Conway contends.

Q: What evidence has LG&E provided that supports its belief that high-usage customers are subsidizing low-usage customers' demand-related costs?

A: None. In response to discovery, the Company acknowledges that it does not possess data regarding the demand of most of its residential customers.[22] Without such data, the Company cannot determine whether the average load factor for high-usage residential customers differs from that for the class as a whole. Thus, the Company has no evidence to support its speculation that the recovery of demand-related costs through the energy rate gives rise to subsidization of low-usage customers by high-usage customers.

Likewise, LG&E does not possess demand data for residential distributed generation ("DG") customers and therefore cannot determine whether the average load factor for these customers differs materially from the class average.[23] The Company therefore has no way of determining whether the growth of distributed generation in its service territory will

[22] Company Response to Sierra Club Supplemental Data Request No. 1.

[23] Company Response to Sierra Club Supplemental Data Request No. 2.

exacerbate (or mitigate) subsidization of DG customers' demand-related costs by non-DG customers.

Q: What do you recommend with regard to the Company's proposal to separate the residential energy rate into fixed and variable cost components?

A: The Commission should reject this proposal because it will serve to confuse and misinform residential customers regarding the distinction between the "fixed" and "variable" costs recovered in the energy rate and regarding the extent to which recovery of "fixed" costs in the energy rate contributes to intra-class subsidization.

Q: Does this conclude your direct testimony?

A: Yes.

Qualifications of

JONATHAN F. WALLACH

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SUMMARY OF PROFESSIONAL EXPERIENCE

1990–Present **Vice President, Resource Insight, Inc.** Provides research, technical assistance, and expert testimony on electric- and gas-utility planning, economics, regulation, and restructuring. Designs and assesses resource-planning strategies for regulated and competitive markets, including estimation of market prices and utility-plant stranded investment; negotiates restructuring strategies and implementation plans; assists in procurement of retail power supply.

1989–90 **Senior Analyst, Komanoff Energy Associates.** Conducted comprehensive cost-benefit assessments of electric-utility power-supply and demand-side conservation resources, economic and financial analyses of independent power facilities, and analyses of utility-system excess capacity and reliability. Provided expert testimony on statistical analysis of U.S. nuclear plant operating costs and performance. Co-wrote *The Power Analyst*, software developed under contract to the New York Energy Research and Development Authority for screening the economic and financial performance of non-utility power projects.

1987–88 **Independent Consultant.** Provided consulting services for Komanoff Energy Associates (New York, New York), Schlissel Engineering Associates (Belmont, Massachusetts), and Energy Systems Research Group (Boston, Massachusetts).

1981–86 **Research Associate, Energy Systems Research Group.** Performed analyses of electric utility power supply planning scenarios. Involved in analysis and design of electric and water utility conservation programs. Developed statistical analysis of U.S. nuclear plant operating costs and performance.

EDUCATION

BA, Political Science with honors and Phi Beta Kappa, University of California, Berkeley, 1980.

Massachusetts Institute of Technology, Cambridge, Massachusetts. Physics and Political Science, 1976–1979.

PUBLICATIONS

"The Future of Utility Resource Planning: Delivering Energy Efficiency through Distributed Utilities" (with Paul Chernick), *International Association for Energy Economics Seventeenth Annual North American Conference* (460–469). Cleveland, Ohio: USAEE. 1996.

"The Price is Right: Restructuring Gain from Market Valuation of Utility Generating Assets" (with Paul Chernick), *International Association for Energy Economics Seventeenth Annual North American Conference* (345–352). Cleveland, Ohio: USAEE. 1996.

"The Future of Utility Resource Planning: Delivering Energy Efficiency through Distribution Utilities" (with Paul Chernick), *1996 Summer Study on Energy Efficiency in Buildings* 7(7.47–7.55). Washington: American Council for an Energy-Efficient Economy, 1996.

"Retrofit Economics 201: Correcting Common Errors in Demand-Side-Management Cost-Benefit Analysis" (with John Plunkett and Rachael Brailove). In proceedings of "Energy Modeling: Adapting to the New Competitive Operating Environment," conference sponsored by the Institute for Gas Technology in Atlanta in April of 1995. Des Plaines, Ill.: IGT, 1995.

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"First Year of SOS Procurement." 2004. Prepared for the Maryland Office of People's Counsel.

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Louisville Gas and Electric Company

Minimum Connection Cost of Service Based on the Cost of Service Study
For the 12 Months Ended June 30, 2018

Rate RS

	Description	Distribution	Customer Service Expenses	Total
(1)	Rate Base	$ 32,055,915	$ 2,307,010	$ 34,362,925
(2)	Rate Base Adjustments	$ -	$ -	$ -
(3)	Rate Base as Adjusted	$ 32,055,915	$ 2,307,010	$ 34,362,925
(4)	Rate of Return	4.92%	4.92%	
(5)	Return	$ 1,575,629	$ 113,395	$ 1,689,025
(6)	Interest Expenses	$ 841,797	$ 60,583	$ 902,380
(7)	Net Income	$ 733,832	$ 52,813	$ 786,645
(8)	Income Taxes	$ 529,666	$ 38,119	$ 567,785
(9)	Operation and Maintenance Expenses	$ 12,245,835	$ 18,688,875	$ 30,934,710
(10)	Depreciation Expenses	1,773,201	-	$ 1,773,201
(11)	Other Taxes	417,160	-	$ 417,160
(12)	Other Depreciation Expenses	-	-	$ -
(13)	Expense Adjustments - Prod. Demand	-	-	$ -
(14)	Expense Adjustments - Energy	-	-	$ -
(15)	Expense Adjustments - Trans. Demand	-	-	$ -
(16)	Expense Adjustments - Distribution	-	-	$ -
(17)	Expense Adjustments - Other	(8,276)	(596)	$ (8,872)
(18)	Revenue Adjustments - Prod Demand	-	-	$ -
(19)	Proforma Adjustments - Total	$ (8,276)	$ (596)	$ (8,872)
(20)	Total Cost of Service	$ 16,533,216	$ 18,839,794	$ 35,373,010
(21)	Less: Misc Revenue - Prod Demand			$ -
(22)	Less: Misc Revenue - Energy	-	-	$ -
(23)	Less: Misc Revenue - Other	(362,496)	(26,088)	$ (388,585)
(24)	Less: Misc Revenue - Total	(362,496)	(26,088)	$ (388,585)
(25)	Net Cost of Service	$ 16,170,720	$ 18,813,706	$ 34,984,425
(26)	Billing Units	4,369,310	4,369,310	
(27)	Unit Costs	$ 3.70	$ 4.31	$ 8.01

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CERTIFICATE OF SERVICE

This is to certify that the foregoing copy of the DIRECT TESTIMONY OF JONATHAN WALLACH ON BEHALF OF SIERRA CLUB AND AMY WATERS, and Exhibits thereto, is a true and accurate copy of the document being filed in paper medium; that the electronic filing was transmitted to the Commission on March 3, 2017; that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding; and that a copy of the filing in paper medium is being hand delivered to the Commission.

JOE F. CHILDERS