COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application of Kentucky Power Company For (1) A General Adjustment of Its Rates for Electric Service; (2) An Order Approving Its 2017 Environmental Compliance Plan; (3) An Order Approving Its Tariffs and Riders; (4) An Order Approving Accounting Practices to Establish a Regulatory Asset or Liability Related to the Big Sandy 1 Operation Rider; and (5) An Order Granting All Other Required Approvals and Relief	)	CASE No. 2017-00179

DIRECT TESTIMONY OF DAVID E. DISMUKES, PH.D.

On Behalf of

Office of the Kentucky Attorney General

October 3, 2017

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I. INTRODUCTION AND QUALIFICATIONS

Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

A. My name is David E. Dismukes. My business address is 5800 One Perkins Place Drive, Suite 5-F, Baton Rouge, Louisiana, 70808.

Q. WOULD YOU PLEASE STATE YOUR OCCUPATION AND CURRENT PLACE OF EMPLOYMENT?

A. I am a Consulting Economist with the Acadian Consulting Group, LLC ("ACG") a research and consulting firm that specializes in the analysis of regulatory, economic, financial, accounting, statistical, and public policy issues associated with regulated and energy industries. ACG is a Louisiana-registered partnership, formed in 1995, and is located in Baton Rouge, Louisiana.

Q. DO YOU HOLD ANY ACADEMIC POSITIONS?

A. Yes. I am a full Professor, Executive Director, and Director of Policy Analysis at the Center for Energy Studies, Louisiana State University ("LSU"). I am also a full Professor in the Department of Environmental Sciences and the Director of the Coastal Marine Institute in the College of the Coast and Environment at LSU. I also serve as an Adjunct Professor in the E. J. Ourso College of Business Administration (Department of Economics), and I am a member of the graduate research faculty at LSU.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been retained by the Kentucky Attorney General's Office of Rate Intervention ("Attorney General") to provide an expert analysis and opinion regarding several rate design proposals offered by Kentucky Power Company ("KPCo" or the "Company") in this proceeding. Specifically, I was asked to evaluate the proposed rate design in the context of the economic hardships present in the Company's eastern Kentucky service territory. I have also reviewed the Company's proposal to increase its monthly Kentucky Economic Development Surcharge ("KEDS") used to support the Company's economic development initiatives.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. The balance of testimony is organized into the following sections:

- Section II: Summary of Recommendations
- Section III: Overview of the Eastern Kentucky Economy
- Section IV: Revenue Distribution and Rate Design
- Section V: The Company's Economic Development Programs and Surcharge Proposal
- Section VI: Conceptual Issues with the K-PEGG Program
- Section VII: Proposed K-PEGG Expansion and the Eastern Kentucky Economy
- Section VIII: Conclusions and Recommendations

Q. HAVE YOU PREPARED ANY EXHIBITS SUPPORTING YOUR DIRECT TESTIMONY?

A. Yes. Attachment A to my testimony provides my academic vita that includes a full listing of my publications, presentations, pre-filed expert witness testimony, expert reports, expert legislative testimony, and affidavits. In addition, I have prepared nine (9) exhibits in support of my testimony.

II. <u>SUMMARY OF RECOMMENDATIONS</u>

Q. WHAT ARE YOUR OVERALL CONCLUSIONS REGARDING THE ECONOMIC IMPACTS ASSOCIATED WITH THE COMPANY'S OVERALL RATE INCREASE PROPOSAL?

A. This increase comes at a very inopportune time for Eastern Kentucky ratepayers. These ratepayers have experienced considerable economic hardships dating back to the last economic recession and, in many instances, are still feeling the lingering impacts of this economic downtown and the change in public policy prejudicing the use of coal as a primary fuel. While there is some evidence that the Eastern Kentucky economy is starting to turn around, this potential economic turn-around does not support laddering the region with additional electric utility rate increases; affordability is still a real and important issue for many households in this region. Further, these ratepayers have seen considerable cumulative rate increases over the past several years and the addition of yet another additional rate increase will likely be overly-burdensome to many households, particularly many working and lower-income families. Lastly, the Company's rates are already relatively high, as compared with other regional peer utilities. As I will show later in my testimony, the Company's customer and energy charges are some of the highest in the region: this rate increase will, at best, maintain what are already high and unattractive electricity service rates, and, at worst, will exacerbate what is already a bad situation. Thus, I am recommending that the Commission limit any revenue increase in this matter. This recommendation is based on a number of considerations that I discuss further in my testimony but include: (a) a finding by other Attorney General witnesses that the merits and cost information upon which this rate request are based are questionable; (b) KPCo's customers are unable to afford any rate increase, and (c) a large rate increase to the extent the Company proposes at this time would set the entire economy of Eastern Kentucky back, counteracting any economic expansion that is on the horizon.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE COMPANY'S PROPOSED RATE DESIGN?

A. I recommend that the Commission reject the Company's proposal to increase customer charges for any customer class. Residential customers, in particular, have seen significant increases to electric rates in recent years, and a noticeable shift towards fixed cost recovery.[1] Increases in fixed charges for these customers disproportionately hurt low-income customers in a region that has seen significant hardship in recent years. The Company has ultimately not provided sufficient evidence to justify its proposal. In fact, as I will show later, all of the Company's customer-related costs are already recovered in its fixed customer charge, undermining its purported cost-based justification for considerably higher residential monthly customer charges.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE COMPANY'S PROPOSED INCREASE IN ITS KEDS?

A. I recommend that the Commission reject the Company's proposal to increase its KEDS. Furthermore, I recommend that the Commission eliminate the Company's KEDS, and its associated K-PEGG program since it (1) is not an economically efficient use of ratepayer dollars and (2) the current program suffers from a large number of accountability deficiencies that shift a large amount of the program's economic development performance risk away from the Company and onto ratepayers.

III. OVERVIEW OF THE ECONOMY OF EASTERN KENTUCKY

[1] By law, KPCo has for many years been allowed to recover fuel and environmental costs via separate monthly surcharges. In addition, in KPCo's last base rate case, Case No. 2014-00396, the Commission approved several new tracking mechanisms, including: (a) the BS1OR, which has authorized the company to collect operating costs of its Big Sandy 1 generating unit; and (b) the Big Sandy Retirement Rider, through which the company collects costs of the retirement of Big Sandy Unit 2 and so much of Big Sandy 1 that involved its then coal-firing.

A. Eastern Kentucky Economy post Economic Recession

Q. HAVE YOU EXAMINED HISTORIC KENTUCKY EMPLOYMENT TRENDS?

A. Yes. Exhibit DED-1 presents historic quarterly employment for the Eastern Kentucky region and the state overall. This analysis covers the period starting with the second quarter of 2001 and ending with the second quarter of 2016. In general, Kentucky has seen significant employment declines since the economic recession starting in 2008. Indeed, employment in the state peaked in the fourth quarter of 2007, before declining and ultimately stagnating for years. Kentucky employment did not return to those late 2007 levels again until the fourth quarter, 2014, a full seven years later. Employment in Eastern Kentucky has suffered even greater than the state as a whole over the past decade. Eastern Kentucky employment peaked in the second quarter of 2006, over a decade ago, with a reported employment level of 124,381 jobs and to this date, has not recovered to those levels. The current Eastern Kentucky employment is over 19,000 jobs, or 15.5 percent, lower than levels reported a decade earlier.

Q. HAVE YOU EXAMINED THE HISTORIC MONTHLY EARNINGS ACROSS KENTUCKY?

A. Yes. Exhibit DED-2 presents historic monthly average earnings for both the state and Eastern Kentucky. This analysis shows that while the State was impacted hard during the recent economic recession, average monthly earnings have remained stable, growing consistently even in the face of a weakening labor market. The same earnings trends, however, cannot be said for Eastern Kentucky.

Q. HOW HAVE EASTERN KENTUCKY WORKERS FAIRED RELATIVE TO WORKERS ELSEWHERE IN THE STATE?

A. Eastern Kentucky has historically reported average earnings that are between 10 to 20 percent lower than the state-wide average. Over the past decade, Eastern Kentucky's average wages have tended to stagnate while those elsewhere in the state have increased by moderate amounts (at least, post-recession). There was a time, more recently, where this differential was starting to close to around the 10 percent, rather than 20 percent boundary of this range. However, over the past several years, the progress in closing that relative wage differential has contracted, and wages in Eastern Kentucky are now back up to a level that is 20 percent lower than the statewide average.

Q. WHAT DOES THIS MEAN FOR THE EASTERN KENTUCKY ECONOMY?

A. Eastern Kentucky has been economically depressed for the past decade. Whereas Kentucky as a whole mostly weathered the recent economic recession, Eastern Kentucky suffered immensely. The Commission should take the economic conditions of the region into consideration in evaluating the Company's overall rate and rate design proposals particularly as they relate to important public policy issues such as affordability and rate continuity.

Q. HAS THE COMPANY PROVIDED ANY INFORMATION THAT SUPPORTS THE CONTENTION THAT CUSTOMERS IN ITS SERVICE TERRITORY ARE STRUGGLING FINANCIALLY?

A. Yes. In response to discovery, the Company has separately provided information on (1) the number of customers within its service territory that have made at least one late payment since August 2014,[2] and (2) the numbers of customers during the same time period

[2] Company's Response to Data Request AG 2-003.

that have experienced service disconnections due to delinquencies.[3] The Company's analysis shows that for the period August 2014 through July 2015, 457,559 late payments were made by residential customers. This amount has only grown in recent years, with the period August 2016 through July 2017 seeing 473,760 late payments, a growth of over 3.5 percent.

Q. WHAT DOES THE COMPANY'S DISCONNECTED SERVICE INFORMATION SHOW?

A. The Company's data shows that for accounts receiving multiple disconnects for nonpayment it disconnected 1,386 accounts on more than one occasion in 2015 due to nonpayment with an increase to 1,469 customers receiving multiple disconnects for nonpayment in 2016. Customer disconnection information is only available for the first seven months of 2017, January through July. However, in these seven months, the Company has disconnected 933 accounts, an average rate of more than 133 customers per month. If the rate of disconnections continues through the remainder of the year, the Company will have disconnected nearly 1,600 customers by the end of 2017. This would amount to an 8.2 percent increase year-over-year.

Q. PLEASE DISCUSS THE COMPANY'S HISTORIC RATE INCREASES.

A. Exhibit DED-3 examines the Company's historic rates for residential customers from March 2006 (decided in Case No. 2005-00341) through the Company's current filing. The analysis shows that the Company's residential rates have been increasing rapidly in the past few years. From the Company's 2005 rate case, through its 2014 rate case in Case No. 2014-00396, the Company has increased its customer charge to residential customers by 87.71 percent, or an average annual increase of 9.48 percent per year over a roughly nine-year

[3] Company's Response to Data Request AG 2-004.

period. Likewise, the Company increased its variable energy charge to residential customers by 48.45 percent over the same period, or an average annual increase of 5.24 percent per year.

Q. WHAT HAVE THESE HISTORIC RATE INCREASES MEANT FOR THE COMPANY'S AVERAGE RESIDENTIAL CUSTOMER?

A. Exhibit DED-3 also shows the impact that these historic rate increases have meant for average customers. This analysis is developed from the Company's 2016 annual report filed with the Federal Energy Regulatory Commission ("FERC"), commonly referred to as a FERC Form 1. That annual report lists 2016 average residential customer use as being 1,295 kWh per month. In 2006, a customer using this amount of electricity would see a non-fuel electric bill of $83.59 per month. By 2015, after Case No. 2014-00396, this same customer would have seen a non-fuel electric bill of $126.38 per month. This is an increase of 51.2 percent over a roughly nine year period, or approximately 5.54 percent in annual electric bills. This annualized level of increase is greater than both the national average,[4] as well as the average rate of inflation in the economy over a comparable period of time.

Q. DO THE COMPANY'S PROPOSED RESIDENTIAL RATES IN THE CURRENT PROCEEDING EXACERBATE THE ALREADY HIGH RATE INCREASES SEEN IN RECENT YEARS?

A. Yes. Exhibit DED-3 shows that the Company's proposed rate increase to residential customers will increase what is already a very heavy burden for electric service. If the Company's current proposal is allowed, residential customers will have seen a 198.63 percent increase in fixed customer charges since 2006. This represents a nearly threefold increase in residential customers' fixed charges over a roughly 11-year period, or approximately 17.53

[4] See, U.S. Bureau of Labor Statistics, Consumer Price Index ("CPI") for All Urban Consumers; the average inflation rate for U.S. urban consumers has been 2.0 percent over the last decade (January 2007 through January 2017).

percent per year. Likewise, energy charges for residential customers will have increased by 80.82 percent since 2006 or by 7.13 percent on an annualized basis. Again, these represent annual average increases that exceed the U.S. electric utility average as well as the overall rates of inflation seen in the economy over a comparable time period.

Q. HOW WILL THE COMPANY'S PROPOSED INCREASE IMPACT THE AVERAGE MONTHLY ELECTRIC BILL OF A TYPICAL RESIDENTIAL CUSTOMER?

A. Exhibit DED-3 shows the impact that the Company's proposed rate increase will have on an average monthly bill for a standard residential customer using 1,295 kWh per month. These typical customers will likely see their bills increase to $158.05 per month, which is more than a 25 percent increase to the current typical monthly bill of $126.38. However, when placed in context of the Company's historic rate increases, the average residential customer using 1,295 kWh per month has seen an increase in his/her monthly utility bill of 89.08 percent (**nearly double**) since 2006. This means that over a roughly 11 year period, residential customers have seen an increase in their base electric bills of approximately 7.86 percent **per year**.

Q. IS IT LIKELY THAT THE COMPANY'S RATE INCREASES HAVE ADVERSELY IMPACTED LOW-USE CUSTOMERS?

A. Yes. While the Company's historic and proposed rate increases have significantly impacted all of its residential customers, these historically high rate increases have likely impacted lower use customers proportionally more than those exhibiting higher levels of use. Exhibit DED-3 shows that residential customers using one-half the residential average (discussed above) have seen total base utility rates increase by 53.59 percent for the period

2006 through 2015, or an average of 5.79 percent per year. A customer using 150 percent of the system average per month has seen rates increase by 50.33 percent over the same period, or approximately 5.44 percent per year.

Q. DOES THE COMPANY'S CURRENT PROPOSED RATE DESIGN EXACERBATE THIS LOW-USE/HIGH-USE BILL DIFFERENTIAL?

A. Yes. Under the Company's proposed residential rates, a customer using half of the residential monthly average will see rates that are 96.25 percent greater than in 2006, just 11 years ago. This is an increase of approximately 8.49 percent per year. Likewise, a customer using 150 percent of residential average, while seeing significant increases to electric rates, sees a lower percent increase than a low-use customer. Specifically, a customer using 150 percent of the residential average will have seen electric rates that are 86.46 percent greater than those in 2006 if the Company's proposed rates are approved. This is an average increase of 7.63 percent per year for these customers.

Q. HAVE YOU EXAMINED THE IMPACT OF THE COMPANY'S PROPOSED RATE INCREASE ON THE ABILITY OF EASTERN KENTUCKY CUSTOMERS TO PAY FOR THEIR ELECTRICAL SERVICE?

A. Yes. As noted earlier, Eastern Kentucky has seen significant economic hardship over the last few years, this while seeing increasing electrical rates from KPCo. Over the 12 month period stretching from the 3rd quarter 2015 through the 2nd quarter of 2016, the Eastern Kentucky region saw average monthly household wages of approximately $3,097. This implies that the current typical KPCo monthly bill of $126.38 represents approximately 4.08 percent of the average Eastern Kentucky worker's total monthly earnings. The Company's proposed increase of typical residential utility bills to $158.05 per month increases this percentage of average monthly earnings to 5.10 percent. In other words, under the Company's proposed increase in residential rates, the average Eastern Kentucky citizen will be devoting over 1/20 of their month earnings, or approximately one-half of one day of a bi-weekly pay cycle, towards paying their rate obligation. This is just for the average worker in Eastern Kentucky, and lower income customers will see a higher relative burden.

Q. ARE YOU CONCERNED WITH THE IMPACT ANY INCREASE IN ELECTRICITY RATES MAY HAVE ON CUSTOMER ENERGY USAGE?

A. Yes. It is well-known in economics that there exists an inverse relationship between electric usage and price. This relationship is referred to as the price elasticity of demand. While the price elasticity of demand for electricity is low, it is not zero. In practical terms, this means that, holding other factors constant, any proposed increase in electricity rates will be accompanied by a reduction in customer usage. This is simply the natural reaction of demand whenever costs are increased. As demand decreases in reaction to price increases, this has the potential to create a revenue requirement shortfall in the future, leading to future rate increases.

Q. IN WHAT OTHER WAYS COULD RATEPAYERS REACT TO CASCADING RATE INCREASES?

A. Ratepayers of all rate classes could move to other electric utilities' service territories. In many states, industrial customers that are very sensitive to any utility price increase have already chosen that option. The Company has already provided data that shows that the total number of customers is steadily decreasing in its territory, and increases in electricity will likely exacerbate this phenomenon.

Q. ARE THERE OTHER NEGATIVE IMPACTS ASSOCIATED WITH INCREASING ELECTRICITY RATES?

A. Yes. As noted later in this testimony, increasing electric rates reduces customers' disposable income, and the ability of customers to purchase other goods and services. In this manner increasing electricity rates customers pay causes a negative ripple-effect through the economy and impacts overall economic growth. The Company's proposed increase in electric utility rates runs the risk of harming the economic development of the region it has devoted much effort to improving.

B. Company's Historic Rates

Q. HAVE YOU REVIEWED THE COMPANY'S RATES AGAINST OTHER REGIONAL UTILITIES?

A. Yes, and this analysis is presented in Direct Exhibit DED-4. For this analysis, I collected and utilized information submitted in the FERC Form 1 for regional peer utilities. I have presented an estimated base rate for residential, commercial, and industrial customers in overall rate terms, as well as a rank ordering (from lowest to highest rate) for each regional utility for the years 2007 through 2016.

Q. WHAT DOES THIS COMPARISON OF PEER UTILITY AVERAGE RESIDENTIAL RATES SHOW?

A. The Company's 2016 average residential rate is estimated to be 6.18 percent lower than the peer average rate per customer. However, the Company's 2016 residential rates are nearly 31.1 percent higher than its rates in 2015. Prior to 2016, the Company had one of the lowest base residential rates in the region, however, by 2016 it had fallen to 5^{th} position out of 13 peer utilities.

Q. HAS THE COMPANY PREPARED ANY INTERNAL COMPARISONS OF ITS RATES TO OTHER PEER UTILITIES?

A. No. While the Company states that it uses semi-annual rate comparison of the Edison Electric Institute ("EEI") to compare its residential and industrial rates to other utilities, the Company has not conducted any analyses to evaluate the competitiveness of its rates nor has it made any such comparisons available to intervenors, including the Attorney General, in this proceeding.[5]

IV. REVENUE DISTRIBUTION AND RATE DESIGN

Q. PLEASE EXPLAIN THE PURPOSE OF THE REVENUE DISTRIBUTION PROCESS IN SETTING RATES.

A. The revenue distribution process allocates a utility's overall revenue deficiency across customer classes, which in turn, is used to establish a new set of retail rates to be applied prospectively. The revenue distribution process often uses the results from the CCOSS as its starting point, but not necessarily as its ending point. Class-specific revenue responsibilities are established by allocating the system-wide revenue deficiency to classes that are under-earning, relative to their estimated ROR, and assigning, at least in theory, revenue decreases to those classes that are over-earning relative to their CCOSS-estimated class returns. The class revenue responsibilities that are finally established are then used, in conjunction with each class' billing determinants, to determine rates. In summary, the revenue distribution process can be thought of as the initial step taken to establish rates.

Q. DOES THE REVENUE DISTRIBUTION PROCESS INCLUDE ANY POLICY CONSIDERATIONS?

[5] Company's Response to AG_1_384.

A. Yes. Allocating the overall system-wide revenue deficiency entirely on a full cost of service basis could result in a very significant and adverse rate impact for certain under-earning classes. To avoid such a result, regulators often temper the revenue responsibilities assigned to various customer classes in order to meet a set of broad ratemaking policy goals.

Q. WHAT ARE THOSE BROADER RATEMAKING POLICY GOALS?

A. There are several generally-accepted rate making principles used in utility regulation that include:

1) Rates should be fair, just, and reasonable, and not unduly discriminatory.
2) To the extent possible, gradualism should be used to protect customers from rate shock.
3) Rate continuity should be maintained.
4) Rates should be informed by costs, but class cost of service results need not be the only factor used in rate development.
5) Rates should be understandable to customers.

Q. HOW ARE THE ABOVE PRINCIPLES APPLIED IN DEVELOPING RATES FOR A REGULATED UTILITY?

A. It is important to consider all of the principles I mentioned above. However, any principle's relative weight can change depending upon the importance of certain policy goals. Rate design should strike a balance between policy goals and result in rates that are fair, just, and reasonable. There is no pre-set or universally-accepted formula for developing rates and, as a result, judgment is necessary to formulate a rate design that meets these objectives.

Q. HAS THE COMMISSION COME TO SIMILAR RATE DESIGN CONCLUSIONS?

A. Yes, the Commission has a long standing precedent of using gradualism when setting rates.[6]

A. Revenue Distribution

Q. WHAT IS THE COMMISSION'S GENERAL POLICY ON REVENUE DISTRIBUTION?

A. The Commission has generally used the cost of service study as a guide when allocating the revenue requirement among the rate classes.[7] However, in the instance that the Commission finds the cost of service study to be insufficient or unreasonable the Commission has used total revenue when assigning the revenue increase or decrease to each rate class.[8] Thus, the Commission has found that holding slavishly to strict CCOSS results can be counterproductive under certain circumstances.

Q. PLEASE EXPLAIN HOW THE COMPANY HAS PROPOSED TO DISTRIBUTE ITS CLASS REVENUE REQUIREMENTS.

A. The Company states that, consistent with the Commission's long-standing policy of gradualism, its application makes small movement towards an equalized rate of return across all customer classes.[9] As a result the Company is proposing to reduce the residential class

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[6] In the Matter of Application of Kentucky Power Company for: (1) A General Adjustment of its Rates for Electric Service; (2) An Order Approving Its 2014 Environmental Compliance Plan; (3) An Order Approving its Tariffs and Riders; and (4) An Order Granting All Other Required Approvals and Relief, Case No. 2014-00396, Order, June 22, 2015, p. 58.

[7] In The Matter of an Adjustment of the Gas Rates of the Union Light, Heat And Power Company; Case No. 2005-00042, Order, December 22, 2005, p. 62.

[8] In the Matter of General Adjustment of Electric Rates of East Kentucky Power Cooperative, Case No. 2006-00472, Order, July 7, 2008, p. 5.

[9] Direct Testimony of Ranie K. Wohnhas, 8:19-22.

"subsidy" by five percent.[10] The Company has proposed to allocate the revenue requirement in proportion to each customer class's rate base.[11]

B. Rate Design

Q. WHAT ARE THE COMPANY'S RATE DESIGN GOALS?

A. The Company does not outline its specific rate design goals but does state that its underlying approach is to design rates and rate components in a manner that reflects the costs to provide service to each of its customer classes.[12]

Q. PLEASE EXPLAIN HOW RATES WERE DETERMINED IN THE COMPANY'S LAST RATE CASE.

A. The revenue distribution in the Company's last rate case, Case No. 2014-00396 was the result of a non-unanimous Settlement Agreement that the Commission approved.[13] As a result of the settlement, the Residential class received a 9.89 percent increase, while the remaining classes received increases between 5.13 percent and 8.86 percent.[14]

Q. DOES THE COMPANY PROPOSE CHANGING ANY OF ITS CURRENT RATE STRUCTURES IN THE CURRENT PROCEEDING?

A. Yes. The Company proposes to "refine" its rate design for residential customers, creating a new optional pilot residential demand metering tariff.[15] The Company also

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[10] Id., 8:22-23.

[11] Company's response to AG_1_285, Attachment KPCO_R_KPSC_1_73_Attachment 35_KPCO_CCOS_-Test_Year_2017_-_DRB_-_FINAL_-_ KPSC_DR_1-73.xlsx,

[12] Direct Testimony of Alex E. Vaughan, 9:6-8.

[13] In the Matter of Application of Kentucky Power Company for: (1) A General Adjustment of its Rates for Electric Service; (2) An Order Approving Its 2014 Environmental Compliance Plan; (3) An Order Approving its Tariffs and Riders; and (4) An Order Granting All Other Required Approvals and Relief, Case No. 2014-00396, Order, June 22, 2015.

[14] Id., Order, June 22, 2015, Settlement Agreement, Exhibit 1, April 30, 2015.

[15] Direct Testimony of Alex E. Vaughan, 9:22 to 10:2.

proposes to combine small and medium general service customers into a newly designed rate structure under a new general service tariff.[16]

Q. HOW SHOULD POLICY BALANCE RATE DESIGN GOALS BETWEEN SETTING APPROPRIATE CUSTOMER CHARGES AND VOLUMETRIC RATES?

A. Modern utility pricing theory is primarily concerned with the development of optimal tariff design, which over the years has become dominated by a form of pricing referred to as a "two-part tariff," sometimes referred to more technically as a non-linear (or non-uniform) pricing approach. Once a class revenue requirement is established, the goal for regulators should be one that sets the most appropriate rates based upon various efficiency and equity considerations. Balancing the weights of how costs are recovered between fixed rates, variable rates, block rates, and seasonal rates are all integrated parts of that process.

Q. WHAT IS THE APPROPRIATE ROLE OF COSTS IN SETTING RATES BASED UPON A TWO-PART TARIFF?

A. Costs can be instructive in establishing a baseline upon which prices may be set, but costs do not need to serve as the sole or exclusive basis for rates in order for them to be set optimally (*i.e.,* fixed charges do not need to strictly equal fixed costs, variable rates need not strictly equal variable costs). Unfortunately, the "fixed charge-equals-fixed cost" philosophy gets repeated so often that it can often drown out meaningful discussions about other equally important considerations in setting rates in imperfect markets. In fact, appropriate rate setting in the context of a two-part tariff typically has more to do with consumer demand than it does with cost.

[16] Id.

C. Customer Charges

Q. DISCUSS THE COMPANY'S RESIDENTIAL CUSTOMER CHARGE PROPOSALS.

A. The Company proposes to increase the fixed basic service or customer charge to $17.50 per month from the current $11.00 per customer per month.[17] The Company states that the reason behind its proposed increased in residential customer charges is to "more accurately reflect the actual fixed cost of providing service to those customers."[18] Specifically, the Company argues that the rate structures for customer classes that utilize demand charges are better aligned with cost causation principles than those that do not because fixed costs are generally recovered through a demand charge.[19] The Company notes that the current low basic service charge creates intra-class subsidies between customers, specifically disadvantaging higher usage customers including electric heating customers.[20]

Q. HAS THE COMPANY PROVIDED ANY ESTIMATED TYPICAL BILL IMPACTS?

A. To an extent. The Company provides an analysis of what it characterizes as a demonstration of the intra-class subsidies present in its current residential service schedule.[21] The Company states that a Kentucky family using 2,200 kWh on average per month, which the Company represents as being typical of a customer using electric heat, will on average over contribute $290 in intra-class subsidies. The Company also maintains that smaller use customers like a customer using only 1,000 kWh per month or 400 kWh per month will receive subsidies of $58 and $232 per year, respectively.

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[17] Id., 10:5-6.
[18] Id., 10:10.
[19] Id., 10:11-13.
[20] Id., 10:18-21.
[21] Id., 11:9.

Q. PLEASE EXPLAIN HOW THE COMPANY DEVELOPED ITS PROPOSED RESIDENTIAL CUSTOMER CHARGE.

A. The Company states that it calculated a fixed monthly customer charge at full cost of service rates to be approximately $38 per month. In other words, $38 was calculated by the Company as representing the fixed portion of the distribution system used to serve the residential class. No specific reason is given to support the Company's proposed $17.50 basic service charge position, besides that it is consistent with the principle of gradualism when considered against the potential for a customer charge of $38 per month.[22]

Q. HOW DID THE COMPANY ARRIVE AT ITS ESTIMATED MONTHLY FIXED COSTS FOR DISTRIBUTION SERVICE OF $38 PER MONTH?

A. The Company uses its CCOSS as a starting point. From there, the Company assigned 100 percent of the customer portion of the revenue requirement assigned to residential customers to customer-related costs that would be included in the proposed customer charge.[23] Equally important is the fact that the Company also assigned a portion of the remaining distribution revenue requirements, specifically primary and secondary voltage distribution systems, to these costs. These primary/secondary distribution system costs, in turn, were developed using the results of a study that compares each distribution plant account's cost components to what the total cost would be if all components of these distribution plant components were the typical or average size installed by the Company when connecting the average distribution level customer.[24] The Company's study found that 77 percent of secondary-voltage systems and 78 percent of primary-voltage systems were

[22] Id., 14:3-5.
[23] Id., 14:13-16.
[24] Id., 14:21 through 15:3.

associated with serving customer demands, or represented fixed utility costs.[25] The total cumulative fixed costs found in each cost category: customer-related, secondary-voltage, and primary-voltage distribution system, was then divided by the average number of residential customers during the test year to reach the estimated fixed monthly cost of $37.88 per customer.

Q. DO YOU AGREE WITH THE COMPANY'S ANALYSIS?

A. No. The Company analysis of "fixed" costs is flawed. Specifically, the Company assigns demand-related costs as being essentially the equivalent of customer-related costs, and thus fixed. *This is fundamentally incorrect.* Demand-related costs are not the equivalent of customer-related costs, and are variable, particularly over time, with respect to customer usage patterns, namely a customer's load profile.

Q. CAN YOU EXPLAIN WHAT YOU MEAN BY DEMAND-RELATED COSTS?

A. Yes. Demand-related costs are associated with meeting maximum energy demands. Electric substations and line transformers are designed, in part, to meet the maximum demand requirement for the portion of the overall distribution system with which they are associated. The most common demand allocation factors used in a COSS are those related to system coincident peaks ("CP") or non-coincident customer class peaks ("NCP").

Q. HOW ARE ENERGY-RELATED COSTS DEFINED?

A. Energy-related costs are defined as those that tend to change with the amount of electricity (i.e., kWh) sold. Electric generation costs and high-voltage transmission lines, for instance, can be allocated, in part, based on some measure of electricity sales.

Q. WHAT ABOUT CUSTOMER-RELATED COSTS?

[25] Id., Exhibit AEV-2.

A. Customer-related costs are those associated with connecting customers to the distribution system, metering household or business usage, and performing a variety of other customer support functions.

Q. HAVE OTHER UTILITIES ARGUED THAT A PORTION OF PRIMARY AND SECONDARY DISTRIBUTION FACILITIES SHOULD BE ASSIGNED TO CUSTOMERS AS BEING "FIXED" IN NATURE?

A. Yes. The Company's arguments are strikingly similar to COSS arguments advanced by some utilities that there exists a definable portion of primary and secondary distribution facilities associated with serving customers rather than serving the utility load. Such analyses utilize one of two methods, either what is called a Minimum System Study ("MSS")[26] or what is called a Zero-Intercept Study.[27] A MSS estimates the hypothetical minimum costs of developing a system that only provides customers with connection to the company's electric system, but not a system sufficient to actually serve the customer's electrical needs.[28] A Zero-Intercept Study, on the other hand, uses statistical relationships revealed through regression analyses to estimate the minimum system costs per customer associated with different distribution systems serving no electrical load.[29]

Q. ARE THERE ANY THEORETICAL SHORTCOMINGS ASSOCIATED WITH MSS AND ZERO-INTERCEPT STUDIES?

A. Yes. These analyses deal in hypotheticals that often do not exist in the real world, including the assumption that somehow there is an electric distribution system out there in the

[26] Electric Utility Cost Allocation Manual (January, 1992), National Association of Regulatory Utility Commissioners, p. 90.

[27] Electric Utility Cost Allocation Manual (January, 1992), National Association of Regulatory Utility Commissioners, p. 92.

[28] Electric Utility Cost Allocation Manual (January, 1992), National Association of Regulatory Utility Commissioners, p. 90.

[29] Electric Utility Cost Allocation Manual (January, 1992), National Association of Regulatory Utility Commissioners, p. 92.

world that could be plausibly built to serve customers but not load. In this the Company makes the same fallacy by assigning a portion of its primary and secondary-voltage distribution systems as being fixed relative to the number of customers taking service off of its system. The underlying assumption and modeling of such an analysis are difficult, if not impossible, to verify due to the simple fact that there exists no electrical system designed only to provide customer connections and not serve their electric loads. Thus, while the Company's study is not a true minimum-system or zero-intercept study, and instead can be thought of as an average system study, it still suffers from some of the same methodological shortcomings as either a minimum system study or a zero-intercept study. As such, the Company's analysis should be dismissed as somehow justifying its customer charge proposals in this proceeding.

Q. HAS THE ACADEMIC LITERATURE IN UTILITY REGULATION QUESTIONED THE ASSIGNING OF DEMAND-RELATED COSTS AS FIXED RELATIVE TO THE NUMBER OF CUSTOMERS TAKING ELECTRICAL SERVICE?

A. Yes. Dr. James Bonbright, in his seminal work on public utility rates, raised a number of questions about the use of such methodologies in developing CCOSS and rate design.[30] Bonbright's primary concern was the lack of empirical support in the academic literature for a causal relationship between distribution system costs and the number of customers. The true driving factors of utility distribution system costs are much more complicated and depend on a host of other factors, such as the size of a service territory and the population density within. The incremental costs of constructing an appropriate distribution system to serve an additional customer within an urban area with existing nearby infrastructure is substantially less than the

[30] James C. Bonbright, et al. Principles of Public Utility Rates. 1988 Edition, p. 491.

costs to extend an existing utility system by potentially miles to serve an additional customer located in a rural area, a fact inherently ignored by arbitrarily assigning these costs as fixed customer costs as the Company has done in its analysis:

> …the annual costs of this phantom, minimum-sized distribution system are related as customer costs and are deducted from the annual costs of the existing system, only the balance being included among those demand-related costs to be mentioned in the following section. Their [minimum distribution costs] inclusion among the customer costs is defended on that, since they vary directly with the area of the distribution system (or else with the length of the distribution lines, depending on the type of distribution system), they therefore vary directly with the number of customers. Alternatively, they are calculated by the "zero-intercept" method whereby regression equations are run relating cost to various sizes of equipment and eventually solving for the cost of a zero-sized system (Sterzinger, 1981).
>
> What this last-named cost imputation overlooks, of course, is the very weak correlation between the area (or the mileage) of a distribution system and the number of customers served by this system. For it makes no allowance for the density factor (customer per linear mile or per square mile). Our casual empiricism is supported by a more systematic regression analysis in (Lessels, 1980) where no statistical association was found between distribution costs and number of customers. Thus, if the company's entire service area stays fixed, an increase in number of customers does not necessarily betoken any increase whatever in the costs of a minimum-sized distribution system.[31]

Q. IS THERE INFORMATION FROM THE COMPANY'S CCOSS WHICH CAN BE APPROPRIATELY USED TO JUDGE THE REASONABLENESS OF THE COMPANY'S CURRENT CUSTOMER CHARGES?

A. Yes. While, as stated previously, there is no requirement that a rate class' customer charge should recover all or even most of the customer-related costs, this metric is commonly

[31] James C. Bonbright, et al. Principles of Public Utility Rates. 1988 Edition, p. 491.

used to judge the reasonableness of a utility's customer charge and the ability of the revenues generated from these charges to cover customer-related costs.

Q. DID YOU PREPARE AN ANALYSIS OF COSTS COMMONLY ASSOCIATED WITH CUSTOMER CHARGES?

A. Yes, and that has been provided on Schedule DED-5. "Customer-related" expense accounts are those typically allocated on the basis of customers and can include: installation of meters and service drops; meter maintenance; meter reading expense; customer records and collections; customer billing and accounting; customer service and information; and sales expense. These costs can also include the depreciation expense associated with the meter and service drop plant accounts and property taxes as well as the carrying charges (at the Company's requested rate of return).

Q. HOW DO THE COMPANY'S RESIDENTIAL CUSTOMER CHARGE REVENUES COMPARE WITH THE CUSTOMER-RELATED RESULTS OF ITS CCOSS?

A. Exhibit DED-5 presents a comparison of the results of the Company's CCOSS with respect to customer-related costs. The analysis confirms that the Company's stated presentation that strictly customer-related costs for the residential customer class account for only $7.47 per customer per month.

Q. HOW DO THE COMPANY'S SMALL AND LARGE COMMERCIAL CUSTOMER CHARGES COMPARE WITH THE RESULTS OF ITS CCOSS?

A. The results of the Company's non-residential classes' revenues are also shown in DED-5. The Company's customer charge revenues for the Small General Service ("SGS") and the Company's secondary Medium General Service ("MGS") are each 146 percent of their class cost responsibility. Likewise, the customer charge revenues for the Large General Service ("LGS") secondary class recovers 254 percent of its cost of service responsibilities.

Q. WHAT DO THE RESULTS OF YOUR ANALYSIS SHOW?

A. The results of my analysis shows that the Company's existing customer charge for the residential customer class recovers over 147 percent of the customer-related costs required to serve that class. Likewise most small, medium, and large general service customers are significantly over recovering their customer related costs. This analysis shows that the Company's existing customer charges are more than adequate to recover the Company's associated customer-related cost of service.

Q. HAVE YOU COMPARED THE COMPANY'S RESIDENTIAL CUSTOMER CHARGES TO OTHER REGIONAL ELECTRIC UTILITIES?

A. Yes, and this analysis is presented in Exhibit DED-6. This analysis shows that the Company's current residential customer charge of $11.00 per month is noticeably greater than the regional average of $9.60 per month, by nearly 14.6 percent. This exhibit surveys current residential and small commercial customer charges for major vertically-integrated electric utilities operating in Kentucky and the surrounding region. There are only five electric utilities in the survey with residential customer charges more than the Company's current residential customer charge of $11.00, and 11 utilities less than the Company's current residential customer charge. If the Company's proposal of $17.50 per customer per month is approved, the Company would become the least competitive investor owned utility in the survey with respect to monthly customer charges.

Q. HAVE YOU COMPARED THE COMPANY'S SMALL COMMERCIAL CUSTOMER CHARGES TO OTHER REGIONAL ELECTRIC UTILITIES?

A. Yes. The Company's current small commercial customer charge of $17.50 per month is greater than the average small commercial customer charge of $16.38 for other regional utilities. Furthermore, out of 16 electric distribution companies in the survey, nine utilities have a customer charge for small commercial customers that is lower than the Company's current customer charge. This means that the Company currently has the seventh highest customer charge for small commercial customers in the region.

Q. IS THE COMPANY'S PROPOSED RATE DESIGN INCONSISTENT WITH THE PROMOTION OF ENERGY EFFICIENCY AND CONSERVATION?

A. Yes, for the simple reason that it places more costs into the fixed component of rates than in the variable component. This reduces economic incentives for ratepayers to control monthly utility bills through energy efficiency and conservation efforts, because only the variable component of bills is avoidable.

Q. HAVE OTHER COMMISSIONS RECOGNIZED THE DETRIMENTAL EFFECT INCREASED FIXED CHARGES HAVE ON ENERGY EFFICIENCY?

A. Yes. In rejecting a request by Baltimore Gas and Electric to increase customer charges as part of a larger rate design proposal, the Maryland Public Service Commission ("MPSC") recognized the need to allow customers the opportunity to control their monthly bills by reducing energy usage.

> Even though this issue was virtually uncontested by the parties, we find we must reject Staff's proposal to increase the fixed customer charge from $7.50 to $8.36. Based on the reasoning that ratepayers should be offered the opportunity to control their monthly bills to some degree by controlling their energy usage, we instead adopt the Company's proposal to achieve the entire revenue requirement increase through volumetric and demand

> charges. This approach also is consistent with and supports our EmPOWER Maryland goals.[32]

Q. IS THE MPSC ALONE IN ITS BELIEF THAT HIGH FIXED CHARGES DISCOURAGES EFFICIENT USE OF ENERGY?

A. No. A research document presented for consideration by the membership of the National Association of Regulatory Utility Commissioners ("NARUC") found decoupling as one of three major approaches to delink utility revenues from sales. One alternative listed was Straight-Fixed Variable ("SFV") rate design, which as a proposal places all fixed-related costs to fixed charges while relegating only variable charges to volumetric rates. The NARUC research noted this type of rate design to be problematic because of its effects on customer incentives to conserve energy:

> **Straight-Fixed Variable Rate Design.** This mechanism eliminates all variable distribution charges and costs are recovered through a fixed delivery services charge or an increase in the fixed customer charge alone. With this approach, it is assumed that a utility's revenues would be unaffected by changes in sales levels if all its overhead or fixed costs are recovered in the fixed portion of customers' bills. <u>This approach has been criticized for having the unintended effect of reducing customers' incentive to use less electricity or gas by eliminating their volumetric charges and billing a fixed monthly rate, regardless of how much customers consume</u>.[33]

Q. HAS ANY NATIONAL PUBLIC POLICY ANALYSIS NOTED THE EFFICIENCY DISINCENTIVES ASSOCIATED WITH SFV-TYPE RATE DESIGNS?

A. Yes. The National Action Plan for Energy Efficiency ("NAPEE"), a joint venture of the U.S. Department of Energy and U.S. Environmental Protection Agency, published a whitepaper on various rate design effects on encouraging energy efficient behaviors. The

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[32] In The Matter of the Application of Baltimore Gas and Electric Company for Adjustment in its Electric and Gas Base Rates. Maryland Public Service Commission. Case No. 9299. Order No. 85374, Issued February 22, 2013, p. 99.

[33] "Decoupling for Electric & Gas Utilities: Frequently Asked Questions (FAQ)" (September 2007), Grants & Research Department, National Association of Regulatory Utility Commissioners, p. 5. (Emphasis added).

NAPEE postulated that SFV had a detrimental effect on economic signals to encourage customers to change energy usage behavior and investments in energy efficiency devices, and specifically noted that such disincentives persist even when applied to individual components of a customer's utility bill, such as SFV for strictly distribution services:

> Because [SFV] tends to shift costs out of volumetric charges, it tends to reduce customers' efficiency incentive, because the marginal price of additional consumption is reduced. <u>While SFV rates are being considered to better reflect the utility's costs behind the rate, these rates do not encourage customers to change energy usage behavior or invest in efficiency technologies</u>. Such customer disincentives persist even when SFV rates are applied to individual components of the bill, such as charges for distribution service.[34]

Q. DOES THE COMPANY MAKE ANY OTHER ARGUMENTS CONCERNING ITS PROPOSAL TO INCREASE CUSTOMER CHARGES FOR RESIDENTIAL CUSTOMERS?

A. Yes. The Company argues that increased customer charges will reduce customer bill volatility, particularly in high usage months and for the Company's electric heating customers who tend to experience very high usage during winter heating months. Likewise, the Company argues that its proposed rate design change will help lower income customers.

> A higher basic service charge will help lower income customers who, because they often do not have the resources to invest in weatherization and energy efficient appliances, have higher than average usage.[35]

Q. DO YOU AGREE WITH THE COMPANY'S ARGUMENT THAT AN INCREASE IN RESIDENTIAL CUSTOMER CHARGES WILL ASSIST LOW INCOME CUSTOMERS?

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[34] "Customer Incentives for Energy Efficiency Through Electric and Natural Gas Rate Design" (September 2009), National Action Plan for Energy Efficiency, pp. 13-14.

[35] Direct Testimony of Alex E. Vaughan, 13:6-8.

A. No. The Company's argument is fundamentally flawed since higher customer charges make it increasingly more difficult for lower income households to reduce their electricity bills as a share of their relatively limited income. This is simply regressive and will have deleterious impacts on lower-income households, not positive impacts. Lower income customers are not benefited by reduced price volatility as much as they are by the ability to control their usage and actually reduce their monthly electric bill.

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTION THAT THERE IS NOT A DIRECT CORRELATION BETWEEN LOWER INCOME HOUSEHOLDS AND LOWER ELECTRICITY USE?

A. No. The Company argues that low income households have higher than average electric use because these customers do not have the resources to invest in weatherization or energy efficient appliances.[36] While the Company's general statement about the availability of weatherization and energy efficiency appliances for low income households may be true, the Company's assertion requires one to assume that low income households are not necessarily or even generally related to lower electrical use households. The suggestion that electric usage falls as income rises is contrary to basic economic theory that says that the demand for a "normal" good or service increases as income increases. In fact, there are

[36] Direct Testimony of Alex E. Vaughan, 13:6-8.

numerous studies in the academic literature supporting the hypothesis that electricity is a "normal good."[37]

Q. HAVE YOU CONDUCTED ANY ANALYSES EXAMINING THE RELATIONSHIP OF ELECTRICITY USAGE AND INCOME?

A. Yes. Page 1 of Schedule DED-7 provides the results of an analysis I have performed using data from the 2009 Residential Electricity Consumption Survey ("RECS") produced by the United States Energy Information Administration ("EIA") and household data from the Census division in which Kentucky is located.[38] The results show a positive relationship between electricity consumption (in kWh terms) and income. This clearly shows that as income increases electricity consumption increases, and vice versa: as income decreases, electricity usage decreases. Thus asserting, as the Company does, that electricity usage for low income households is actually equal or higher than higher income households is simply incorrect.

Q. DO THE RESULTS OF YOUR ANALYSIS CHANGE IF YOU CONTROL FOR THE NUMBER OF INDIVIDUALS IN A RESPECTIVE HOUSEHOLD TYPE OR BY PHYSICAL HOUSEHOLD SIZE?

A. No, the results of my earlier analysis hold even if differences between the number of people in a household and household square feet are included. Page 2 of Schedule DED-7

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[37] Alberini, A., W. Gans, D. Velez-Lopez. 2011, "Residential consumption of gas and electricity in the U.S.: The role of prices and income," Energy Economics 33, 870-881; Bernard, J., D. Bolduc, N. Yameogo, 2011, "A pseudo-panel data model of household electricity demand," Resource and Energy Economics 33(1), 315-325; Dax, P. 1987, "Estimation of Income Elasticity from Cross-Section Data," Applied Economics 19 (11), 1471-1482; Fell, H., S. Li, A. Paul. 2010, "A New Look at Residential Electricity Demand Using Household Expenditure Data," RFF DP 10-57; Fullerton, T. D. Juarez, A. Walke. 2012, "Residential Electricity Consumption in Seattle," Energy Economics; Reiss. P.C., and M. W. White, 2005, "Household electricity demand revisited," Review of Economic Studies 72, 853-858; and Swan L.G., V. I. Ugursan, 2009, "Modeling of end-use energy consumption in the residential sector: A review of modeling techniques," Renewable and Sustainable Energy Reviews 13, 1819-1835.

[38] This census division includes the states of Alabama, Kentucky, Mississippi, and Tennessee. This is the most detailed level of aggregation available in the RECS.

provides the results of a regression-based approach that estimates the relationship between electricity consumption (in kWh terms), using income, the number of members in a household, and the heated square footage in the household as independent variables. The results clearly show that electricity usage increases as both the number of members in a household and the square footage of the household increases.

Q. DO LOWER INCOME HOUSEHOLDS SPEND PROPORTIONATELY MORE IN ELECTRICITY THAN HIGHER INCOME HOUSEHOLDS?

A. Yes. Lower income households spend a larger share of their income on electricity than higher income households. Put another way, while households consume more electricity as income increases, the share of their income they spend on electricity decreases as their income increases. Schedule DED-8 clearly shows this relationship. Consumers with income of less than $10,000 per year spend approximately 16 percent of their income on electricity, while a family that makes between $50,000 and $60,000 per year only spends approximately three percent of their income on electricity. As income increases further, this percentage continues to decline.

Q. WHAT DO THESE FINDINGS MEAN FOR LOWER-INCOME HOUSEHOLDS UNDER THE COMPANY'S RATE DESIGN PROPOSALS?

A. Lower-income households will likely be impacted negatively and in a fashion disproportionate to higher income households. As I noted earlier, electricity use increases as income increases, meaning that contrary to the Company's assertions, lower-income households will likely use less, rather than more electricity than their upper income counterparts. The Company's residential class revenue requirement, however, is set with an average monthly fixed customer charge across the entire class, meaning that lower than average use customers (like low-income customers) will be harmed more by these rate proposals than upper-income households. This proposal will be additionally harmful when considering the fact that lower-income households will have to give up a proportionately larger share of their disposable income to effectively support the customer charge set by the Company under its fixed customer charge rate design proposals.

V. OVERVIEW OF THE COMPANY'S ECONOMIC DEVELOPMENT PROGRAMS AND SURCHARGE PROPOSAL

Q. PLEASE DESCRIBE THE COMPANY'S HISTORIC ECONOMIC DEVELOPMENT ACTIVITIES.

A. The Company states that it re-initiated its economic development efforts in 2012[39] and began offering monetary incentives for economic development in 2014 through the "Kentucky Power Economic Advancement Program" ("KEAP"), a program that offered economic development grant assistance to Lawrence County and its contiguous Kentucky counties.[40] The Company also notes that in 2014 it began partnering with several community banks in what is referred to as a Local Bank Financing Program which provides investment-grade lending opportunities for local banks aiding in the diversification of local bank loan portfolios.[41]

Q. PLEASE EXPLAIN THE BACKGROUND OF THE KEAP PROGRAM.

A. The KEAP program was created in the Non-Unanimous Stipulation and Settlement Agreement resolving some of the issues associated with the Company's 2012 application seeking a Certificate of Public Convenience and Necessity ("CPCN") for a proposed transfer from a Company affiliate, Ohio Power Company, of 50 percent of the full interest in the

[39] Direct Testimony of Brad Hall, 6:19-20.
[40] Direct Testimony of Brad Hall, 7:4-6.
[41] Direct Testimony of Brad Hall, 7:6-13.

Mitchell Generating Station located in Moundsville, West Virginia (the "Mitchell Transfer Case").[42] The CPCN proceeding required the Company to conduct in-depth analyses of reasonable portfolio alternatives in lieu of expensive retrofits needed for the Company's Big Sandy Unit 2 generating station to continue operating under the expanded requirements.[43] The Company noted in this CPCN proceeding that the Mitchell units would be compliant and effective resource alternatives since these units were already equipped with flue gas desulfurization ("FGD") and selective catalytic reduction ("SCR") systems.[44] In the CPCN preceding the Company also requested the authority to accumulate and defer for review and recovery approximately $28 million in other costs associated with its analytic efforts to meet environmental requirements at its Big Sandy Unit 2.[45]

Q. WHY WAS THE KEAP PROGRAM CREATED AS PART OF THE CPCN SETTLEMENT?

A. The CPCN proceeding generated significant interest from the public, especially those in the region most affected by the Company's decision to abandon consideration of the installation of pollution control systems at Big Sandy Unit 2, and instead retire the existing unit.[46] This public interest included the Kentucky House Majority Floor Leader and the Lawrence County Attorney.[47] Of particular concern was the direct loss of the plant's 150 jobs

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[42] In the Matter of: Application of Kentucky Power Company for (1) a Certificate of Public Convenience and Necessity Authorizing the Transfer to the Company of an Undivided Fifty Percent Interest in the Mitchell Generating Station and Associated Assets; (2) Approval of the Assumption by Kentucky Power Company of Certain Liabilities in Connection with the Transfer of the Mitchell Generating Station; (3) Declaratory Rulings; (4) Deferral of Costs Incurred in Connection with the Company's Efforts to Meet Federal Clean Air Act and Related Requirements; and (5) All Other Required Approvals and Relief; Case No. 2012-00578; Order dated October 7, 2013; p. 1.

[43] Id., Verified Application; ¶1.

[44] Id., Verified Application; ¶2.

[45] Id., Order dated October 7, 2013; pp. 1-2.

[46] Id., Order dated October 7, 2013; p. 24.

[47] Id., Order dated October 7, 2013; p. 24.

as well as losses in franchise tax revenues to local government.[48] The Company entered into a partial stipulation with some parties (but not the Attorney General) in which the Company agreed to a series of commitments designed to mitigate the negative economic impacts of the plant's closure.[49] These commitments included a shareholder contribution of $100,000 annually for five years towards economic development and job training in the Lawrence county and the contiguous Kentucky counties impacted by the closure of Big Sandy Unit 2. The Commission increased this commitment to $200,000 for economic development and $33,000 annually for job training after finding that the initial commitment was insufficient to mitigate the significant negative economic impact caused by the closure of Big Sandy Unit 2.[50]

Q. HOW DOES THE COMPANY FUND ITS KEAP PROGRAM?

A. The KEAP program has been funded from shareholder funds since 2014 by an annual amount of up to $200,000. The Company notes that in 2016, it only received grant applicants for $177,500.[51] To make up this shortfall, the Company issued a total of $222,000 in KEAP grants in 2017.[52] The Company's financial commitment will end with the program's termination in 2018.[53]

Q. DID THE COMPANY CREATE ANY OTHER ECONOMIC DEVELOPMENT INCENTIVES IN 2014?

A. Yes. The Company's Economic Development Rider ("EDR") tariff was submitted and approved in 2014, in accordance with Commission directives in a 1990 Commission

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[48] Id., Order dated October 7, 2013; p. 25.
[49] Id., Order dated October 7, 2013; p. 2.
[50] Id., Order dated October 7, 2013; pp. 36-37.
[51] Direct Testimony of Brad Hall, 24:21 to 25:1.
[52] Direct Testimony of Brad Hall, 25:1-2.
[53] Direct Testimony of Brad Hall, 25:4-7 and 25:10-11.

Order in Administrative Case No. 327.[54] The EDR tariff is available to new and existing customers looking to locate or expand facilities in the Company's service territory. EDR-eligible companies are required to have or increase their current monthly base maximum billing demand by at least 500 kW, and are eligible to take service under the Company's Large General Service ("LGS") or Industrial General Service ("IGS") tariff schedules.[55] Under the terms of the EDR tariff, eligible customers are offered an Incremental Billing Demand Discount ("IBDD") that reduces monthly billing demand charges by 50 percent for the first year of service, a discount that decreases by 10 percent for each subsequent year as available until full tariff rates after the end of the fifth year.[56] Likewise, eligible customers are offered a Supplemental Billing Demand Discount ("SBDD") that further reduces monthly billing demand charges by five percent for the first year if the customer demonstrates the creation of at least 50 jobs, or 2.5 percent for the first year if the customer demonstrates the creation of at least 25 jobs.[57] In both cases, the SBDD's discount decreases by one-half of one percent each year as available, until being completely removed after the fifth year of service.

Q. DOES THE EDR TARIFF HAVE ANY OTHER SERVICE RESTRICTIONS?

A. Yes. The EDR requires customers to demonstrate, to the Company's satisfaction, that absent the availability of the discounted rate, the qualifying new or increased electrical demand would either not be placed in service or would have been located outside of the

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[54] In the Matter of: Application of Kentucky Power Company for (1) Approval of an Economic Development Rider; (2) for any Required Deviation from the Commission's Order in Administrative Case No. 327; and (3) All Other Required Approvals and Relief; Case No. 2014-00336; Order dated March 4, 2015.

[55] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

[56] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

[57] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

Company's service territory.[58] Also, customers taking service under the EDR tariff must contract with the Company for a term of service that is twice the agreed-to discount period. Therefore the full five year terms of the IBDD and SBDD presented earlier are for customers who enter into contracts of at least 10 years; only four years of discounts are available for customers who enter into eight year service contracts, etc.[59] Furthermore, all service under the EDR tariff is classified by the Company as a "Special Contract," and thus subject to Commission approval prior to implementation of the discounted rate.[60] Lastly, the entire EDR tariff is not available for additional subscription once a total of 250 MW of new load has been added to the Company's system under the tariff.[61]

Q. HAS THE COMPANY EXPANDED ITS OFFERING OF DIRECT ECONOMIC DEVELOPMENT INCENTIVES SINCE 2014?

A. Yes. In 2016, the Company implemented the Kentucky Power Economic Growth Grants ("K-PEGG").[62] Through the K-PEGG program, the Company issues economic grants throughout the entirety of the Company's service territory, as opposed to the KEAP program that provides grant assistance only to entities in Lawrence County and its contiguous Kentucky counties.[63] Unlike the KEAP program, K-PEGG is funded through the Kentucky Economic Development Surcharge ("KEDS").[64]

Q. PLEASE EXPLAIN THE KEDS.

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[58] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

[59] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

[60] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

[61] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

[62] Direct Testimony of Brad Hall, 7:16-17.

[63] Id. at 7:16-17.

[64] Id., 7:17-20.

A. The KEDS was proposed by the Company in its prior rate case, Case No. 2014-00396.[65] Specifically, the Company proposed in that proceeding to establish a surcharge equal to $0.15 per meter per month for all customers in its service territory.[66] All revenues derived from the ratepayer surcharge would be matched equally by the Company with shareholder funds.[67] The combined funding streams were expected to generate a total of $615,014 annually, which would be used by the Company to fund economic development initiatives.[68]

Q. IS THE COMPANY REQUESTING AN INCREASE TO THE KEDS?

A. Yes. The Company is requesting to increase the KEDS by $0.10 per meter per month.[69] If approved, this would raise the current $0.15 charge per meter to $0.25 per meter per month, resulting in a $3.00 per meter per year ratepayer charge.[70]

Q. WHAT SUPPORT DOES THE COMPANY PROVIDE FOR ITS KEDS PROPOSAL?

A. The Company provides its "InSite Economic Development Gap Analysis" to identify areas within its service territory where economic development activities are needed.[71] This "gap analysis" was one of the first activities performed by the Company after it re-initiated its economic development efforts in 2012.[72] The gap analysis focuses on such topics as: a lack of functional and properly trained local or regional economic development organizations; limited competitive and marketable industrial parks and buildings; insufficient marketing

[65] Id., Order dated June 22, 2015.
[66] Id., Order dated June 22, 2015; p. 49.
[67] Id., Order dated June 22, 2015; p. 49.
[68] Id., Order dated June 22, 2015; p. 49.
[69] Direct Testimony of Matthew J. Satterwhite, 17:12-13.
[70] Id. at 17:15-16.
[71] Direct Testimony of Brad N. Hall, 8:16-20.
[72] Direct Testimony of Brad N. Hall, 6:19 to 7:3.

infrastructure for available opportunities; and insufficient workforce development and training.[73]

Q. HOW MUCH HAS THE COMPANY COLLECTED UNDER THE KEDS?

A. The Company states that as of February 28, 2017, it has collected $493,529 through its surcharge and when coupled with the 50 percent match, leads to a total of $987,058 that has been allocated to the K-PEGG program.[74]

Q. HOW DOES THE COMPANY SELECT THE ORGANIZATIONS OR ENTITIES RECEIVING K-PEGG GRANTS?

A. The Company has a review team made up of the Company leaders who represent various departments and geographical areas of Kentucky Power's service territory, as well as representatives from the Kentucky Association for Economic Development and the Kentucky Cabinet for Economic Development.[75] The Company states that the "review team was selected to provide a breadth of insight and knowledge to evaluate each application's merit with regard to the program's mission of economic advancement."[76]

Q. DID RATEPAYERS OR STAKEHOLDERS HAVE ANY INPUT ON THE TEAM SELECTED TO EVALUATE K-PEGG GRANT RECIPIENTS?

A. No, the Company did not consult ratepayers when considering the selection team.[77] The Company stated that it "selected the team based on experience and understanding of community and economic development as well as availability to participate in the process confidentially, frequently, and reliably. Economic development and community development

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[73] Id., 9:1-7.
[74] Company's response to AG_1_033.
[75] Company's response to AG_1_395.
[76] Id.
[77] Company's response to AG_1_395.

are technical processes and require understanding of the process to evaluate applications appropriately."[78]

VI. CONCEPTUAL ISSUES WITH THE K-PEGG PROGRAM

A. The Company has failed to demonstrate the need for the K-PEGG program.

Q. WHAT RATIONALE DOES THE COMPANY PROVIDE FOR ITS K-PEGG PROGRAM?

A. The Company notes that its service territory has suffered from a significant economic downturn, primarily driven by decreases in coal and steel production, since 2008.[79] For instance, coal mining employment as fallen from a 2008 level of 14,373 miners to a 2016 figure of 3,833 miners.[80] Additionally, the Company notes the decreased international demand for steel that has caused some steel blast furnace operations to shut down including the AK Steel plant in Ashland, Kentucky in December 2015, resulting in a loss of over 600 jobs.[81] The Company states that these economic trends have resulted in declining customer counts and retail sales. The Company notes that it has lost 6,931 customers from 2008-2016, and seen retail sales fall from approximately 7.24 GWh to 5.80 GWh over the same period.[82]

Q. DOES THE COMPANY PROVIDE ANY FURTHER JUSTIFICATION FOR ITS K-PEGG PROGRAM?

A. No. The Company states the region's economic experiences since 2008 underscore the dangers of an undiversified economic base.[83] Because of this, the Company feels that

[78] Company's response to AG_1_395.
[79] Direct Testimony of Brad Hall, 4:17-19.
[80] Direct Testimony of Brad Hall, 5:1-4.
[81] Direct Testimony of Brad Hall, 5:9-11.
[82] Direct Testimony of Brad Hall, 5:15-19.
[83] Direct Testimony of Brad Hall, 5:22 to 6:1.

promoting greater industrial diversity, through the K-PEGG program, will increase economic growth opportunities and would take advantage of the myriad of talents found within the communities Kentucky Power serves.[84] No other justification has been provided for continuing this program, nor increasing the surcharge that supports its activities.

Q. HAVE YOU EXAMINED THE TRENDS IN COMPANY CUSTOMER COUNTS AND ELECTRICITY SALES?

A. Yes. Exhibit DED-9 shows the Company historic customer counts for the years 2006 through 2016. This analysis shows that the number of customers on the Company's system has decreased from a maximum of 175,705 in 2007, to 168,848 in 2016. This loss of 6,857 customers represents a customer count decrease of 3.9 percent, a decrease of 0.4 percent on an annual average basis. Exhibit DED-9 likewise shows the historic trend in Company electric sales. This analysis shows that electric sales have decreased from a maximum of 7,349 GWh in 2010 to 5,863 GWh in 2016. This loss of 1,486 GWh represents a decrease of 20.2 percent, or 2.9 percent per year on an average annual basis over the last seven years.

Q. HAS THE COMPANY EXPERIENCED SIMILAR DOWNWARD TRENDS IN ITS ELECTRIC SALES REVENUES?

A. No. The Company has been able to maintain its electric sales revenues even while facing declining billing determinates. For instance, the Company has actually increased its revenues by *over $166.7* million since 2007, the last year of positive customer growth. This represents a 41.0 percent revenue increase, or an increase in revenues of approximately 4.1 percent annually. The Commission should note that while the Company has lost nearly 7,000 customers since 2007, rate increases to its remaining customers have actually increased the Company's revenue position, contrary to the Company's assertions.

[84] Direct Testimony of Brad Hall, 6:3-8.

Q. DOES THE CURRENT STATE OF THE REGIONAL ECONOMY OF EASTERN KENTUCKY JUSTIFY THE COMPANY'S K-PEGG PROGRAM?

A. No. Despite the Company's good intentions, it is asking to take money away from ratepayers and redistribute it within the Eastern Kentucky economy. The Commission should not approve a re-distributive program of this nature without ensuring that the K-PEGG's program leads to known and measurable benefits that are greater than the cost imposed on ratepayers in the form of higher rates.

Q. HAS THE COMPANY PROVIDED ANY MEANINGFUL QUANTITATIVE ANALYSES SUPPORTING THE CONTINUATION OF THE K-PEGG PROGRAM OR ITS PROPOSED EXPANSION?

A. No. The Company has failed to provide any meaningful quantitative evidence that the K-PEGG program has successfully encouraged commercial and industrial customers to locate or remain in the Company's service territory, nor has the Company provided meaningful quantitative evidence supporting the proposed expansion of the program.[85] What little evidence the Company has provided on these subjects does not provide a complete picture of "success" of its K-PEGG offerings.

Q. WHAT EVIDENCE HAS THE COMPANY OFFERED AS AN INDICATOR OF K-PEGG PROGRAM SUCCESS?

A. The Company simply states that it has approved a total of 17 K-PEGG grants out of 23 grant requests since the introduction of the program in January of 2016.[86] About half of the approved grant requests (12) totaling $652,500, were made in 2016, while five grant requests,

[85] See, Company's Response to AG_1_362.
[86] Direct Testimony of Brad Hall, 15:9-11.

totaling $178,700, were made in the month of April, 2017.[87] In total, the Company has provided economic development grants of $831,200 in the first 18 months of the program's operations.[88]

Q. EXPLAIN THE COMPANY'S ESTIMATES OF THE JOBS THAT HAVE BEEN CREATED BY THE K-PEGG PROGRAM.

A. While the Company references four projects as "early success stories"[89] of its K-PEGG program, it is unclear what impact, if any, the K-PEGG program has had in creating known and measurable employment gains. In fact, the Company explicitly notes that "many of the projects funded through the K-PEGG Program are not designed to result in direct job creation."[90] To this point, it should be recognized that all K-PEGG grants have been provided to regional third party entities not directly associated with job creation. For example, the two largest grants provided through the K-PEGG program have been to the Big Sandy Regional Industrial Development Authority to acquire property owned in Martin County and to the Floyd County Fiscal Court for the purposes of providing bridge financing for a proposed gas to liquids projects being developed.[91] In both cases, the K-PEGG funding appears to have at most expedited existing development. Specifically, the acquisition of property in Martin County allowed the prior owner to relocate operations to a larger facility in Magoffin County without needing to take the time to find a buyer of its existing facility.[92] Likewise, the bridge funding alleviated the need for the gas to liquids project developer to obtain outside loans.[93]

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[87] Direct Testimony of Brad Hall, pp. 15-16.
[88] Direct Testimony of Brad Hall, pp. 15-16.
[89] Direct Testimony of Brad Hall, 17:16.
[90] Direct Testimony of Brad Hall, 17:16-18.
[91] Direct Testimony of Brad Hall, p. 16.
[92] Direct Testimony of Brad Hall, 18:2-10.
[93] Direct Testimony of Brad Hall, p. 16.

Q. WHAT EVIDENCE HAS THE COMPANY PROVIDED AS INDICATION OF THE NEED TO EXPAND THE K-PEGG PROGRAM?

A. The Company states that the early results of the K-PEGG Program show promise, but that additional work is necessary to make the region's economic development efforts more competitive.[94] The Company states that its proposed expansion will allow it to support more economic development projects and allow the Company more flexibility to respond to economic development opportunities as they arise.[95] The Company notes, as an example, that what it believes is a current funding deficiency for the program forced it to delay its review of two 2016 applications.[96]

Q. DO YOU BELIEVE THAT THE COMPANY HAS PROVIDED SUFFICIENT EVIDENCE TO SUPPORT ITS PROPOSED K-PEGG EXPANSION?

A. No. The Company's proposed K-PEGG expansion appears to be based in no small part on the fact that the Company had insufficient funds to handle all requests for grant money in 2016 and in that year alone. The Commission should recognize two items associated with the Company's argument. First, 2016 represents the first year of the K-PEGG Program. Early interest in the K-PEGG program grants may not be indicative of future needs as early program grants could represent stalled or back-logged projects that have accumulated for a number of years. Furthermore, the Commission should recognize that the supporting rationale for its K-PEGG program is partially contradictory to the position it takes in other parts of its testimony that its service territory is continuing to contract.

Q. PLEASE EXPLAIN HOW THE COMPANY'S REQUEST IS CONTRADICTORY.

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[94] Direct Testimony of Brad Hall, 19:16-18.
[95] Direct Testimony of Brad Hall, 20:6-10.
[96] Direct Testimony of Brad Hall, 20:13-15.

A. The Company's primary rationale for its proposed K-PEGG expansion is that it had insufficient funds to process two 2016 applications.[97] However, the Company also reports, in the same year (2016), that its KEAP grant applications (its original economic development program approved as part of its prior Mitchell CPNC) only received grant applicants accounting for 89 percent of its 2016 financial allotment (applications of $177,500 relative to the $200,000 annual commitment).[98] The fact that one economic development program is oversubscribed while the other is significantly undersubscribed, is contradictory.

Q. COULD THE DIFFERENCES IN THE NATURE OF THE TWO PROGRAMS BE IMPACTING THIS APPARENT INCONSISTENCY?

A. Yes. As noted previously, the KEAP program was created to provide economic development funding to the counties directly affected by the Company's closure of one of its Big Sandy generating units. In this, the KEAP program was narrowly focused on counties seeing an immediate negative economic impact from the Company's closed facility. The K-PEGG program on the other hand is noticeably unfocused in either regional scope or purpose.

Q. HAS THE COMPANY PROVEN THAT THE K-PEGG IS MORE EFFECTIVE THAN KEAP?

A. No. The Company has not shown how the K-PEGG program is superior to KEAP or any other potential ways in which it could stimulate economic development, such as through changing/modifying its economic development rate or special contracts.

Q. DOES THE COMPANY CURRENTLY HAVE AN ECONOMIC DEVELOPMENT RATE?

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[97] Direct Testimony of Brad Hall, 20:13-15.
[98] Direct Testimony of Brad Hall, 24:21 to 25:2.

A. Yes, as previously discussed, the Company offers an EDR tariff to its eligible LGS and IGS customers.[99] The EDR tariff is comprised of a declining demand charge for new and existing customers that meet certain load requirements as a means of incentivizing large customers to locate or expand in the Company's service territory. In this manner, the EDR tariff supplements the functionality of the KEAP program since both are tied to a specific economic development-based outcomes: more jobs or more load. The K-PEGG program, on the other hand, is not, and is simply a request by local economic developers for more funds to support their economic development activities. Further, the Company has not identified any current deficiency in either its KEAP program or its EDR that make either inferior to the K-PEGG.

Q. ARE THERE OTHER REASONS TO BELIEVE THAT THE EDR TARIFF IS SUPERIOR TO THE K-PEGG PROGRAM?

A. Yes, since, as explained in greater detail earlier, the EDR includes accountability measures designed to ensure that rate discounts are provided in return for jobs or expanded usage that benefit local communities and ultimately all of the Company's ratepayers.

B. The Company's K-PEGG Program Shifts Performance Risks onto Ratepayers

Q. IS THERE A GENERAL CONCEPTUAL PROBLEM WITH THE COMPANY'S K-PEGG PROGRAM?

A. Yes. At its core, the K-PEGG program is a grant program, providing economic development grants to third-party organizations operating within the Company's service territory that engage in activities designed to market local communities to large commercial

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[99] Rates-Charges-Rules-Regulations for Furnishing Electric Service in the Kentucky Territory Served by Kentucky Power Company (June 30, 2015); P.S.C. KY. No. 10; Sheet No. 37-1 through 37-6, Tariff E.D.R.

and industrial businesses looking to locate or expand existing operations. The program does not directly create jobs, but instead, offers funds to organizations whose primary purposes is to recruit business and industries. Thus, there is no direct, known and measurable dollar-for-dollar tie between K-PEGG funds and jobs, economic output, or increased electricity sales. The "hope" is that these dollars ultimately lead to jobs, but there is no link or requirement in the K-PEGG that they do so. Thus, at least half of the performance risk of the K-PEGG program (i.e., the risk that it will create known and measurable economic benefits) falls upon ratepayers.

Q. HAS THE COMPANY PROVIDED ANY ESTIMATES OF THE NUMBER OF JOBS CREATED THROUGH ITS ECONOMIC DEVELOPMENT PROGRAMS?

A. No. The Company has not provided any quantifiable, known and measurable employment data associated with its K-PEGG program: it has also failed to provide any known and measurable quantitative information on any increases in local tax revenues, economic output, or increases in electricity customers or sales.[100] Instead, the Company references many "early success stories" as the primary benefits that have arisen from its K-PEGG program. This should come as no surprise since the Company itself does not require (as a tariff condition or grant condition) any of the participating economic development organizations to provide post-grant award information verifying employment creation, tax revenue creation, or increased electricity customers/sales: [101] this is simply not a pre-condition for the K-PEGG program.

[100] See, Company's Response to AG_1_372.
[101] Company's Response to AG_1_358, AG_1_387, and AG_2_024.

Q. DO THE FINANCIAL INCENTIVE AND TAX CREDIT PROGRAMS OFFERED BY THE STATE OF KENTUCKY HAVE ANY MINIMUM EMPLOYMENT OR EMPLOYMENT CERTIFICATION REQUIREMENTS?

A. Yes. For instance, the Kentucky Business Incentive ("KBI") program[102] offered by the Kentucky Cabinet for Economic Development provides income tax credits equal to up to 100 percent of the entity's corporate income or limited tax liability from the project. Applicants are required to meet minimum investment levels of at least $100,000, and create a minimum of 10 new full-time jobs and maintain an annual average of 10 new full-time jobs.[103]

Q. IS THE KBI PROGRAM THE ONLY PROGRAM OFFERED BY THE KENTUCKY CABINET FOR ECONOMIC DEVELOPMENT?

A. No, the Cabinet for Economic Development offers at least 27 different tax credit and financial incentive programs in a number of categories including expanding industries, job retention, energy and environment, technology, agriculture, job training, and tourism.[104] Many of these programs have output-contingent requirements such as Kentucky Economic Development Finance Authority ("KEDFA") Direct Loans, which provides reduced loan rates for a portion of fixed asset costs, depending on total capital investment.[105] Further, many of the programs offered by the Cabinet for Economic Development appear to be duplicative to the intent of the K-PEGG program such as the Kentucky Business Investment ("KBI") Program. The KBI Program provides up to 10 years of tax credits for companies looking to locate or expand in Kentucky. The KBI Program provides and an additional 5 years of tax

[102] *See*, KBI Fact Sheet, available at thinkkentucky.com.
[103] *See*, KBI Fact Sheet, available at thinkkentucky.com.
[104] See, http://thinkkentucky.com/Locating_Expanding/kybizince.aspx.
[105] Just the Facts: Kentucky Economic Development Finance Authority (KEDFA) Direct Loan Program (March 2017), available at: http://thinkkentucky.com/kyedc/pdfs/kedfadcp.pdf?02032016.

credits and up to 5 percent of employee gross wages incentives for companies looking to locate to a county designated as 'enhanced incentive' eligible.[106] Finally, the KBI Program, unlike the Company's economic development initiatives, requires eligible projects to meet minimum investment, minimum employment, and minimum employee wage and benefits requirements.[107]

Q. DOES THE COMPANY REQUIRE POTENTIAL GRANT RECIPIENTS SEEKING FUNDING THROUGH THE ECONOMIC DEVELOPMENT SURCHARGE TO COMMIT TO A MINIMUM LEVEL OF CAPITAL INVESTMENT AS A CONDITION OF ELIGIBILITY?

A. No. The Company does not require prospective customers or third party entities to either commit to a minimum level of capital investment, or achieve an actual threshold level of capital investment.[108]

Q. DOES THE COMPANY REQUIRE COMPANIES TO PAY BACK ANY GRANT FUNDING AMOUNTS IF THEY LEAVE THE COMPANY'S SERVICE TERRITORY?

A. No. The Company does not require customers or third party entities to repay the discounts provided to them in the case of a customer ceasing operations in the Company's service territory.[109]

Q. DOES THE COMPANY'S ECONOMIC DEVELOPMENT RIDER REQUIRE ANY MINIMUM USAGE OR JOB CREATION?

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[106] *See*, KBI Fact Sheet, available at thinkkentucky.com.

[107] Just the Facts: Kentucky Business Investment (KBI) Program (June 2017), available at: http://thinkkentucky.com/kyedc/pdfs/KBIFactSheet.pdf?07072017.

[108] Company's Response to AG_1_372.

[109] Company's Response to AG_1_371 and AG_1_377.

A. Yes. The Company's Tariff EDR requires that a new customer have at least a monthly maximum billing demand of 500 kW and an existing customer must increase its monthly billing demand by at least 500 kW. The Company's Tariff EDR also requires that the customer create and sustain at least 25 full-time permanent jobs over the term of the contract.[110]

C. The Company's Proposal is Likely to Shift Costs onto Captive Ratepayers

Q. DO ECONOMIC DEVELOPMENT RIDERS SUCH AS THE COMPANY'S K-PEGG PROGRAM PROVIDE OTHER BENEFITS BESIDES JOBS AND ECONOMIC DEVELOPMENT?

A. As explained previously, the main objective of economic development tariffs is to encourage job creation in the local economy. However, economic development riders are often touted as a means to increase a utility's revenue base by adding large consuming customers with relatively low capacity needs compared to smaller customers, thus allowing a utility to more effectively utilize system assets to maximize revenues. In this manner, economic development riders are thought to potentially lower future rate increases for all customers by increasing the utility's revenue stream without increasing the utility's fixed cost overhead. Indeed, in proposing the K-PEGG and associated KEDS, the Company noted this very purpose of the surcharge, characterizing the increase in revenue streams as an objective of the program.[111]

> The Company, by strengthening communities' ability to grow the service territory economy will grow its load and its

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[110] Kentucky Power Company, Rates-Charges-Rules-Regulations for Furnishing Electric Service, P.S.C. KY No. 10 Original Sheet No. 37-1, Service Rendered On and After June 30, 2015.

[111] See Case No. 2014-00396, In the Matter of the Application of the Kentucky Power Company (1) For a General Adjustment of its Rates for Electric Service; (2) An Order Approving its 2014 Environmental Compliance Plan; (3) An Order Approving its Tariffs and Riders and; (4) An Order Granting all Other Approvals and Relief, Kentucky Public Service Commission Case No. 2014-00396, Direct Testimony of John A. Rogness, III, 19:21 – 20:2.

> customer base. Everything else being equal, this will allow the Company to spread its costs over a greater number of kilowatt hours and customers and keep the cost to individual customers as low as possible.[112]

Q. HAS THE COMPANY ESTIMATED THE EFFECT ITS ECONOMIC DEVELOPMENT EFFORTS HAS HAD ON THE COMPANY'S REVENUES?

A. No, the Company has not provided any analysis of the effect the Company's economic development efforts have had on net revenues.[113] Although the Company did provide data on its revenues associated with new customer's electricity use, the Company states that it "is unable to separately identify increases in revenue associated with expansions arising from the Company's economic development efforts. There is no way from the Company's records to determine whether the cause of a change in a customer's electricity usage is attributable to an expansion or other variables."[114] Furthermore, the Company has not identified incremental revenues generated through its economic development efforts either historically or into the future, as its records do not permit this type of analysis.[115] Because of this, it is impossible to even independently assess the cost effectiveness of the economic surcharge to the Company's ratepayers.

Q. DO YOU BELIEVE THE FAILURE TO JUSTIFY THE COST EFFECTIVENESS OF THE COMPANY'S ECONOMIC DEVELOPMENT EFFORTS REPRESENTS AN INEFFICIENCY OF THE SURCHARGE TARIFF?

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[112] Id. at 19:21 – 20:2.
[113] Company's Response to AG_1_387.
[114] Id.
[115] Id.

A. Yes. As noted earlier, the Company identified an objective of the K-PEGG Program when it was proposed was to keep the costs to individual customers as low as possible.[116] In other words, the program was meant to assist all ratepayers by incentivizing businesses, such as large commercial and industrial customers to relocate or expand in Kentucky, providing a net positive revenue stream to the Company, revenues that would be used to offset rate increases in the future. However, the Company states that it does not maintain records of incremental revenues generated through its economic development programs, nor does it produce forecasts of future revenue growth or decay through the program going into the future.[117]

VII. <u>PROPOSED K-PEGG EXPANSION AND THE EASTERN KENTUCKY ECONOMY</u>

Q. PLEASE DESCRIBE THE COMPANY'S RATIONALE FOR THE CREATION OF THE K-PEGG PROGRAM AND ITS PROPOSED EXPANSION.

A. The Company correctly notes that the eastern Kentucky region has seen an economic downturn dating back to 2008.[118] The Company references sharp decreases in coal mining jobs in eastern Kentucky,[119] and the closure, in December 2015, of the AK Steel facility that employed over 600 people.[120] The Company also notes that these events resulted in a direct customer loss of 6,931 customers between 2008 and 2016, and a corresponding annual sales decrease from around 7.24 GWh to 5.80 GWh (a decrease of 1.44 GWh).[121]

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[116] In the Matter of the Application of the Kentucky Power Company (1) For a General Adjustment of its Rates for Electric Service; (2) An Order Approving its 2014 Environmental Compliance Plan; (3) An Order Approving its Tariffs and Riders and; (4) An Order Granting all Other Approvals and Relief, Kentucky Public Service Commission Case No. 2014-00396, Order, p. 49.

[117] Company's Response to AG_1_387.

[118] Direct Testimony of Brad Hall, 4:17-18.

[119] Direct Testimony of Brad Hall, 5:1-4.

[120] Direct Testimony of Brad Hall, 5:9-11.

[121] Direct Testimony of Brad Hall, 5:15-19.

Q. IS IT TRUE THAT EASTERN KENTUCKY HAS SUFFERED ECONOMIC LOSSES?

A. Yes. However, most of these decreases have arisen in the past, and these past economic trends may not necessarily be indicative of the potential future regional economic performance. Baring negative impacts potentially caused by the Company's proposed rate increase, there are plenty of indicators that show that the previous economic hardship miring eastern Kentucky has subsided, and that the region may even be seeing some moderate growth potential.

Q. ARE THE DATA SHOWING A POTENTIAL TURN AROUND IN THIS PAST ECONOMIC DOWNTURN?

A. Yes. The Company itself also notes many new large industrial customers are expressing an interest in moving into the Company's service territory. For instance, the Company notes that Braidy Industries Inc. announced plans, on April 26, 2017, to construct an aluminum mill near South Shore in Greenup County that will ultimately provide approximately 550 advanced manufacturing and administrative jobs.[122] The Company also notes that a chemical manufacturing company looking to expand its operations in the region has indicated plans to create 100 new jobs at a facility located on the site of a former plant.[123] Likewise, the Company notes that a local economic development organization has marketed the former Big Sandy site to a company needing rail access and that, if developed, this target company's development could lead to the creation of 1,000 jobs.[124]

[122] Direct Testimony of Matthew J. Satterwhite, 11:7-14.
[123] Direct Testimony of Brad Hall, 27:19-22.
[124] Direct Testimony of Brad Hall, 27:22 to 28:2.

Q. HAS THE COMPANY PROVIDED ADDITIONAL DETAILS ON THE ANNOUNCEMENT BY BRAIDY INDUSTRIES TO CONSTRUCT AN ALUMINUM MILL NEAR SOUTH SHORE?

A. Yes. The Company states that the proposed mill will comprise a 2.5 million square foot facility that will cost approximately $1.3 billion to construct.[125] Once opened in 2020, the mill will produce Series 5000, 6000, and 7000 aluminum sheet and plate products for use in the automotive and aerospace industry, and employ approximately 550 advanced manufacturing and administrative jobs.[126] The Company notes that the project, during its construction phase, anticipates supporting up to 1,000 construction jobs.[127] The Company also notes that the mill, once developed, may support on-site research and development activities designed to advance the science and technology of molten-metal manufacturing.[128]

Q. HAS THE COMPANY IDENTIFIED THE EFFECT THE ANNOUNCED BRAIDY INDUSTRIES ALUMINUM MILL WILL HAVE ON THE UTILIZATION OF THE COMPANY'S ELECTRICAL SYSTEM?

A. To an extent. The Company states that its preliminary estimated load for the proposed mill is 55 MW when it becomes fully operational in 2020.[129] Assuming a modest load factor of 80 percent, this is equivalent to 386 GWh per year in sales. As stated earlier, the Company has lost approximately 1,486 GWh in retail sales since 2010, when the Company's sales last peaked. This means that Braidy Industries, as a single new customer, will if the plant is constructed as proposed, reverse nearly 26 percent, or over a quarter, of all of the Company's lost electric sales seen over a six year period since 2010.

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[125] Direct Testimony of Matthew J. Satterwhite, 11:7-14.
[126] Direct Testimony of Matthew J. Satterwhite, 11:8-10.
[127] Direct Testimony of Matthew J. Satterwhite, 11:14-15.
[128] Direct Testimony of Matthew J. Satterwhite, 11:10-12.
[129] Company's Response to Data Request KPSC_2_007.

Q. IS THERE REASON TO BELIEVE THAT THE NEW ALUMINUM MILL WILL CREATE ADDITIONAL ECONOMIC OPPORTUNITIES IN EASTERN KENTUCKY?

A. Yes. Economic theory states that there are multiplier effects to economic "shocks" such as the creation of a large new employer like Braidy Industries. New employees with additional disposable income seek the services of retail and service sector businesses, such as retail shopping centers and coffee shops.[130] In this manner a shock such as this 'induces' new economic growth. Likewise, the new employer itself seeks the services of third party suppliers, some of which may be locally sourced.

Q. HAS THE COMPANY INDICATED A BELIEF THAT LOCATION OF THE BRAIDY INDUSTRIES ALUMINUM MILL WILL SPUR ADDITIONAL ECONOMIC DEVELOPMENT IN EASTERN KENTUCKY?

A. Yes. In a joint announcement with Governor Bevin, Mr. Satterwhite indicated a belief that the new industrial customer will set off an "economic cascade"[131] in the region.

> With this game-changing project in Greenup County, Braidy Industries will positively affect all of Eastern Kentucky, both directly and by attracting other automotive and aerospace-related manufacturers. (…) I'm enthusiastic about the future of our region and will be working alongside Braidy Industries as an economic development partner to ensure its success. Get ready Eastern Kentucky, Braidy Industries is just the first company moving in for what is the best kept secret in the country – the skilled available workforce in our region.[132]

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[130] See, for example, Company's Response to Data Request KIUC_1_060.

[131] Think Kentucky News Release (April 26, 2017); "Gov. Bevin: Braidy Industries to Create 550 Jobs with $1.3 Billion Aluminum Rolling Mill in Eastern Kentucky," available online at: http://www.thinkkentucky.com/newsroom/NewsPage.aspx?x=04262017_Braidy_Industries.html.

[132] Think Kentucky News Release (April 26, 2017); "Gov. Bevin: Braidy Industries to Create 550 Jobs with $1.3 Billion Aluminum Rolling Mill in Eastern Kentucky," available online at: http://www.thinkkentucky.com/newsroom/NewsPage.aspx?x=04262017_Braidy_Industries.html.

Q. IS THE IMPACT OF THE NEW ALUMINUM MILL INCLUDED WITH THE COMPANY'S TEST YEAR?

A. No. The Company states that its test year is for the twelve months ended February 28, 2017, and that the aluminum mill was not announced until April 26, 2017.[133] The Commission should therefore recognize that all future electricity sales and associated revenue associated with Braidy Industries is not included within the Company's requested pro-forma rates.

Q. DID THE COMPANY'S K-PEGG PROGRAM INCENTIVIZE THE LOCATING OF BRAIDY INDUSTRIES TO THE COMPANY'S SERVICE TERRITORY?

A. The Company has not provided any compelling evidence that the K-PEGG grants played any direct role in incentivizing Braidy Industries to locate to Eastern Kentucky.[134] It could just as easily be the case that the Company's willingness to negotiate a special rate contract with the Braidy Industries may be playing just as important, if not a more important role than the K-PEGG grants. The Company notes that it is in the process of negotiating the terms of a special contract with Braidy Industries that will be filed with the Commission for approval.[135] Although KPCo has responded in the record that any potential special contract with Braidy would mark the first time in over a decade that the Company has sought approval for a special contract with one of its customers, prospective or otherwise,[136] nonetheless KPCo has in fact applied for two special contracts in 2017, one with Deane Mining LLC, and the other with McCoy Elkhorn Mining.

[133] Company's Response to KIUC_1_011.
[134] See, Company's Response to KPSC_2_007.
[135] Company's Response to KIUC_1_011.
[136] Company's Response to AG_1_385.

Q. HAS THE COMPANY IDENTIFIED ANY OTHER INDUSTRIES THAT HAVE EXPRESSED AN INTEREST IN LOCATING OR EXPANDING IN ITS SERVICE TERRITORY?

A. Yes. As noted earlier, the Company references two large customers that have expressed interest, or are being courted to develop on the site of the Company's previous Big Sandy 2 electric generation unit. Specifically, the Company notes that One East Kentucky, a regional economic development partner, has been in discussions with a large chemical manufacturing company looking to expand its operations.[137] Likewise, the Kentucky Cabinet for Economic Development, another economic development partner, has marketed the site to a company interested in the site due to its preexisting rail access.[138]

Q. HAS THE COMPANY PROVIDED ADDITIONAL DETAILS ON EITHER OF THE TWO POTENTIAL CUSTOMERS IN QUESTION?

A. The Company declines to provide detailed information on either of the two prospective customers, noting that:

> It (…) is in the interests of customers and Company alike not to jeopardize economic developments by prematurely disclosing the identity of companies seeking to locate in Kentucky Power's service territory.[139]

The only information the Company has provided is that the potential chemical manufacturing company indicates that its development could lead to 100 new jobs[140] while the other customer (needing pre-existing rail access) could create 1,000 jobs.[141] If these two additional projects are developed, it could positively contribute to the utilization of the

[137] Direct Testimony of Brad N. Hall, 27:19-22.
[138] Direct Testimony of Brad N. Hall, 27:22 to 28:2.
[139] Company's Response to KIUC_1_061.
[140] Direct Testimony of Brad N. Hall, 27:19-22.
[141] Direct Testimony of Brad N. Hall, 27:22 to 28:2.

Company's system, potentially at levels comparable to those referenced earlier for the Braidy Industries aluminum mill.

Q. IS THE CREATION OF NEW INDUSTRIAL ACTIVITY IMPORTANT TO THE COMPANY?

A. Yes. While the Company notes its loss in customers over the past few years, the vast majority of its lost energy sales have been due to a substantial loss in industrial sales base. Specifically, the Company states that its weather-normalized total sales to ultimate customers in 2011 was 7,016 GWh, a number that fell to 5,836 GWh in 2016. This results in a decrease of 1,180 GWh in sales from 2011 to 2016, of which losses to industrial customers accounted for 842 GWh, or over 71 percent.[142]

Q. DOES THE COMPANY FORECAST CONTINUAL DECREASES IN INDUSTRIAL ELECTRICAL SALES IN THE FUTURE?

A. No. The Company forecasts that its 2017 internal energy requirement for industrial customers will remain virtually unchanged through 2021.[143] In fact, the Company estimates a slight increase in internal energy requirements for industrial customers. This likewise corresponds to a similar increase in total internal energy requirements for its entire system, 2017 to 2021.[144] Notably, the Company's load forecast process has not changed since its Integrated Resource Plan ("IRP") filed December 20, 2016.[145] Therefore, these forecasts presumably do not include additional electrical load associated with the new Braidy Industries aluminum mill, or potential new customers for the Big Sandy site.

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[142] Company's Response to AG_1_347.
[143] Company's Response to AG_1_348.
[144] Company's Response to AG_1_380.
[145] Electronic 2016 Integrated Resource Planning Report of Kentucky Power Company to the Public Service Commission of Kentucky, Case No. 2016-00413.

Q. IS THERE OTHER EVIDENCE OF POTENTIAL ECONOMIC GROWTH IN EASTERN KENTUCKY?

A. Yes. AEPSC's Economic Forecasting group monitors various economic indicators of historic performance and projections for Kentucky Power's service territory as part of the Company's annual load forecast development and review process.[146] According to the Company, AEPSC's Economic Forecasting group's work is based on information provided by Moody's Analytics.[147] The Company's upper management was provided with this economic outlook on May 18, 2016, and May 12, 2017. In the 2016 presentation, employment was estimated to decrease by 0.1 percent over the decade 2017 through 2027, resulting in a forecast retail sales decrease of 0.3 percent over the same time period.[148] However, in the more recent 2017 presentation, the Company estimates employment to increase by 0.1 percent over the decade 2018 through 2028, thereby reducing its anticipated retail sales decline from 0.3 percent to 0.1 percent.[149]

Q. WHAT SHOULD THE COMMISSION TAKE-AWAY FROM THESE RECENT INDUSTRIAL DEVELOPMENT ANNOUNCEMENTS AND SALES FORECASTS?

A. The Company's service territory has suffered considerably over the past decade. However, some of the data discussed above, and the Company's own internal analyses, tends to show that perhaps the worst of this economic downturn is over, at least for commercial and industrial customers. While the K-PEGG program may seem to have merit, it lacks important accountability provisions and appears to shift economic development program performance

[146] Company's Response to AG_1_381.
[147] Company's Response to AG_1_381.
[148] Company's Response to AG_1_381, attachment "KPCO_R_AG_1_381_Attachment1c.xls."
[149] Company's Response to AG_1_381, attachment "KPCO_R_AG_1_381_Attachment2c.xls."

risk away from the Company and onto ratepayers. While having the Company being a partner in economic development is important, this should not come at any cost, particularly a cost that re-distributes resources from residential customers and applies those valuable economic resources to third parties, that have little to no performance accountability to the ratepayers making these funding contributions. This is an ill-advised and poorly constructed economic development program that deviates considerably from best practices in utility economic development programs, and should be discontinued.

Q. CAN THE COMPANY'S PROPOSED RATE INCREASE NEGATIVELY HURT ANY POTENTIAL ECONOMIC GAINS EASTERN KENTUCKY CUSTOMERS MAY SEE IN THE UPCOMING YEARS?

A. Yes. Just as the creation of a large new employer creates a ripple effect through the economy from multiplier effects, negative economic shocks likewise cause contractionary effects throughout the economy. The proposed increase in customer electrical rates will reduce the disposable income for customers living in the Company's service territory, lowering the amount of money these customers are able to spend in the retail and service sectors. This in turn lowers the earnings margins for these businesses, potentially causing them to reduce worker hours and even job positions to meet expense obligations. In this manner a negative shock such as the increase in customer electric rates 'induces' further contractions in the local economy. The Company's proposed increase in electric utility rates runs the risk of harming the economic development of the region it has devoted much effort to improving.

VIII. CONCLUSIONS AND RECOMMENDATIONS

Q. WHAT ARE YOUR OVERALL CONCLUSIONS REGARDING THE ECONOMIC IMPACTS ASSOCIATED WITH THE COMPANY'S OVERALL RATE INCREASE PROPOSAL?

A. The timing of KPCo's proposed rate increase poses a major hardship for Eastern Kentucky ratepayers. These ratepayers have experienced considerable economic hardships dating back to the last economic recession and, in many instances, are still reeling from the lingering impacts of this economic downtown and decreasing coal usage. While there is some evidence that the Eastern Kentucky economy is starting to turn around, any such potential economic turn-around does not support this rate increase. Affordability remains a highly important issue for many households in this region. Further, these ratepayers have seen considerable cumulative rate increases over the past several years and the addition of yet another additional rate increase will likely prove unbearable to many households, particularly many working and lower-income families. Lastly, the Company's rates are already relatively high, as compared with other regional peer utilities. Indeed, the Company's customer and energy charges are some of the highest in the region. This rate increase will, at best, maintain what are already high and unattractive electricity service rates, and, at worst, will exacerbate an already bad situation. Thus, I am recommending that the Commission limit any revenue increase in this matter. This recommendation is based on a number of considerations that I discuss previously in my testimony but include: (a) a finding by other Attorney General witnesses that the merits and cost information upon which this rate request are based are questionable; (b) KPCo's customers are unable to afford any rate increase, and (c) a large rate increase to the extent the Company proposes at this time would set the entire economy of Eastern Kentucky back, counteracting any economic expansion that is on the horizon.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE COMPANY'S PROPOSED RATE DESIGN?

A. Given the significant increases to electric rates ratepayers have seen in recent years, and a noticeable shift towards fixed cost recovery, I recommend that the Commission reject the Company's proposal to increase customer charges for any customer class. Increases in fixed charges for these customers disproportionately hurt low-income customers in a region that has seen significant hardship in recent years. The Company has ultimately not provided sufficient evidence to justify its proposal. This is especially true given the fact that the Company's existing customer charges recover all of the Company's existing customer-related costs for most rate classes, including the residential class.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE COMPANY'S PROPOSED INCREASE IN ITS KEDS?

A. I recommend that the Commission reject the Company's proposal to increase its KEDS. Furthermore, I recommend that the Commission eliminate the Company's KEDS, and its associated K-PEGG program since it (1) is not an economically efficient use of ratepayer dollars and (2) the current program suffers from a large number of accountability deficiencies that shift a large amount of the program's economic development performance risk away from the Company and onto ratepayers.

Q. DOES THIS CONCLUDE YOUR TESTIMONY FOR OCTOBER 3RD, 2017?

A. Yes.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application of Kentucky Power Company For (1) A General Adjustment of Its Rates for Electric Service; (2) An Order Approving Its 2017 Environmental Compliance Plan; (3) An Order Approving Its Tariffs and Riders; (4) An Order Approving Accounting Practices to Establish a Regulatory Asset or Liability Related to the Big Sandy 1 Operation Rider; and (5) An Order Granting All Other Required Approvals and Relief	)	CASE No. 2017-00179

AFFIDAVIT OF David E. Dismukes, Ph.D.

State of Louisiana)
Parish of East Baton Rouge)

David E. Dismukes, Ph.D., being first duly sworn, states the following: The prepared Pre-Filed Direct Testimony and the Schedules attached thereto constitute the direct testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the Pre-Filed Direct Testimony if asked the questions propounded therein. Affiant further states that, to the best of his knowledge, his statements made are true and correct. Further affiant saith not.

[signature]

SUBSCRIBED AND SWORN to before me this 27 day of September, 2017.

[signature]
NOTARY PUBLIC

My Commission Expires: "Commissioned for Life"

Dajuana W. Moore, Notary Public No.68583

DAJUANA W. MOORE NOTARY PUBLIC NO. 68583 PARISH OF ASCENSION

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EDUCATION

Ph.D., Economics, Florida State University, 1995.
M.S., Economics, Florida State University, 1992.
M.S., International Affairs, Florida State University, 1988.
B.A., History, University of West Florida, 1987.
A.A., Liberal Arts, Pensacola State College, 1985.

Master's Thesis: *Nuclear Power Project Disallowances: A Discrete Choice Model of Regulatory Decisions*

Ph.D. Dissertation: *An Empirical Examination of Environmental Externalities and the Least-Cost Selection of Electric Generation Facilities*

ACADEMIC APPOINTMENTS

Louisiana State University, Baton Rouge, Louisiana

Center for Energy Studies

2014-Current	Executive Director
2007-Current	Director, Division of Policy Analysis
2006-Current	Professor
2003-2014	Associate Executive Director
2001-2006	Associate Professor
1999-2001	Research Fellow and Adjunct Assistant Professor
1995-2000	Assistant Professor

College of the Coast and the Environment (Department of Environmental Studies)

2014-Current	Professor (Joint Appointment with CES)
2010-Current	Director, Coastal Marine Institute
2010-2014	Adjunct Professor

E.J. Ourso College of Business Administration (Department of Economics)

2006-Current	Adjunct Professor
2001-2006	Adjunct Associate Professor
1999-2000	Adjunct Assistant Professor

Florida State University, Tallahassee, Florida

College of Social Sciences, Department of Economics

1995	Instructor

PROFESSIONAL EXPERIENCE

Acadian Consulting Group, Baton Rouge, Louisiana

2001-Current	Consulting Economist/Principal
1995-1999	Consulting Economist/Principal

Econ One Research, Inc., Houston, Texas

1999-2001	Senior Economist

Florida Public Service Commission, Tallahassee, Florida

Division of Communications, Policy Analysis Section

1995	Planning & Research Economist

Division of Auditing & Financial Analysis, Forecasting Section

1993	Planning & Research Economist
1992-1993	Economist

Project for an Energy Efficient Florida &
Florida Solar Energy Industries Association, Tallahassee, Florida

1994	Energy Economist

Ben Johnson Associates, Inc., Tallahassee, Florida

1991-1992	Research Associate
1989-1991	Senior Research Analyst
1988-1989	Research Analyst

GOVERNMENT APPOINTMENTS

2007-Current	Louisiana Representative, Interstate Oil and Gas Compact Commission; Energy Resources, Research & Technology Committee.
2007-Current	Louisiana Representative, University Advisory Board Representative; Energy Council (Center for Energy, Environmental and Legislative Research).
2005	Member, Task Force on Energy Sector Workforce and Economic Development (HCR 322).
2003-2005	Member, Energy and Basic Industries Task Force, Louisiana Economic Development Council
2001-2003	Member, Louisiana Comprehensive Energy Policy Commission.

PUBLICATIONS: BOOKS AND MONOGRAPHS

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2. *Distributed Energy Resources: A Practical Guide for Service.* (2000). With Ritchie Priddy. London: Financial Times Energy.

PUBLICATIONS: PEER REVIEWED ACADEMIC JOURNALS

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5. "The Value of Lost Production from the 2004-2005 Hurricane Seasons in the Gulf of Mexico." (2009). With Mark J. Kaiser and Yunke Yu. *Journal of Business Valuation and Economic Loss Analysis*. 4(2).

6. "Estimating the Impact of Royalty Relief on Oil and Gas Production on Marginal State Leases in the US." (2006). With Jeffrey M. Burke and Dmitry V. Mesyanzhinov. *Energy Policy* 34(12): 1389-1398.

7. "Using Competitive Bidding As A Means of Securing the Best of Competitive and Regulated Worlds." (2004). With Tom Ballinger and Elizabeth A. Downer. *NRRI Journal of Applied Regulation.* 2 (November): 69-85. (*Received 2005 Best Paper Award by NRRI*)

8. "Deregulation of Generating Assets and the Disposition of Excess Deferred Federal Income Taxes." (2004). With K.E. Hughes II. *International Energy Law and Taxation Review*. 10 (October): 206-212.

9. "Reflections on the U.S. Electric Power Production Industry: Precedent Decisions Vs. Market Pressures." (2003). With Robert F. Cope III and John W. Yeargain. *Journal of Legal, Ethical, and Regulatory Issues*. Volume 6, Number 1.

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4. “Electric Utility Restructuring and Strategies for the Future.” (2001). With Scott W. Geiger. *Proceedings of the Southwest Academy of Management*. March.

5. “Applications for Distributed Energy Resources in Oil and Gas Production: Methods for Reducing Flare Gas Emissions and Increasing Generation Availability” (2000). With Ritchie D. Priddy. *Proceedings of the International Energy Foundation – ENERGEX 2000*. July.

6. “Power System Operations, Control, and Environmental Protection in a Restructured Electric Power Industry” (1998). With Fred I. Denny. *IEEE Proceedings: Large Engineering Systems Conference on Power Engineering*. June: 294-298.

7. “New Paradigms for Power Engineering Education.” (1997). With Fred I. Denny. *Proceedings of the International Association of Science and Technology for Development*. October: 499-504.

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11. "Regulating Mercury Emissions from Electric Utilities: Good Environmental Stewardship or Bad Public Policy? (2005). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 54 (2): 401-424

12. "Using Industrial-Only Retail Choice as a Means of Moving Competition Forward in the Electric Power Industry." (2005). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 54(1): 211-223

13. "The Nuclear Power Plant Endgame: Decommissioning and Permanent Waste Storage. (2005). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 53 (4): 981-997

14. "Can LNG Preserve the Gas-Power Convergence?" (2005). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 53 (3):783-796.

15. "Competitive Bidding as a Means of Securing Opportunities for Efficiency." (2004). With Elizabeth A. Downer. *Electricity and Natural Gas* 21 (4): 15-21.

16. “The Evolving Markets for Polluting Emissions: From Sulfur Dioxide to Carbon Dioxide.” (2004). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 53(2): 479-494.

17. “The Challenges Associated with a Nuclear Power Revival: Its Past.” (2004). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 53 (1): 193-211.

18. “Deregulation of Generating Assets and The Disposition of Excess Deferred Federal Income Taxes: A ‘Catch-22’ for Ratepayers.” (2004). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 52: 873-891.

19. “Will Competitive Bidding Make a Comeback?” (2004). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 52: 659-674

20. “An Electric Utility’s Exposure to Future Environmental Costs: Does It Matter? You Bet!” (2003). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 52: 457-469.

21. “White Paper or White Flag: Do FERC’s Concessions Represent A Withdrawal from Wholesale Power Market Reform?” (2003). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 52: 197-207.

22. “Clear Skies” or Storm Clouds Ahead? The Continuing Debate over Air Pollution and Climate Change” (2003). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 51: 823-848.

23. “Economic Displacement Opportunities in Southeastern Power Markets.” (2003). With Dmitry V. Mesyanzhinov. *USAEE Dialogue*. 11: 20-24.

24. "What’s Happened to the Merchant Energy Industry? Issues, Challenges, and Outlook" (2003). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 51: 635-652.

25. "Is There a Role for the TVA in Post-Restructured Electric Markets?" (2002). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 51: 433-454.

26. “The Role of Alaska North Slope Gas in the Southcentral Alaska Regional Energy Balance.” (2002). With William Nebesky and Dmitry Mesyanzhinov. *Natural Gas Journal*. 19: 10-15.

27. “Standardizing Wholesale Markets For Energy.” (2002). With K.E. Hughes II. *Oil, Gas and Energy Quarterly.* 51: 207-225.

28. “Do Economic Activities Create Different Economic Impacts to Communities Surrounding the Gulf OCS?” (2002). With Williams O. Olatubi. *IAEE Newsletter*. Second Quarter: 16-20.

29. “Will Electric Restructuring Ever Get Back on Track? Texas is not California.” (2002). With K.E. Hughes II. *Oil, Gas and Energy Quarterly.* 50: 943-960.

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34. “California Dreaming: Are Competitive Markets Achievable?” (2001). With K.E. Hughes II. *Oil, Gas and Energy Quarterly*. 49: 743-759.

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41. “Coming to a Neighborhood Near You: The Merchant Electric Power Plant.” (1999). With K.E. Hughes II. *Oil, Gas, and Energy Quarterly.* 48:433-441.

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4. “Reading the Signs for the Energy Complex” (2015). *10/12 Industry Report*. Baton Rouge Business Report. Q:1.

5. “Louisiana’s Export Opportunities.” (2015). *10/12 Industry Report*. Baton Rouge Business Report. September, 15.

6. “Don’t Kill Hydraulic Fracturing: It’s the Golden Goose.” (2015). *Mobile Press Register*. May 22. Also carried by Alabama Media Group and the following newspapers: *Birmingham News*, *Huntsville Times*, and *Birmingham Magazine*.

7. “The Least Effective Way to Invest in Green Energy.” (2014). *Wall Street Journal*. Journal Reports: Energy. New York: Dow Jones & Company, October 2.

8. “Stop Picking Winners and Losers.” (2013). *Wall Street Journal*. Journal Reports: Energy. New York: Dow Jones & Company, June 18.

<u>PUBLICATIONS: REPORTS AND OTHER MANUSCRIPTS</u>

1. *Economic Impact and Re-Employment Assessment of PES Philadelphia Refining Complex*. (2017). Report prepared on behalf of Philadelphia Energy Solutions, 43 pp.

2. *Beyond the Energy Roadmap: Starting Mississippi’s Energy-Based Economic Development Venture.* (2014). Report prepared on behalf of the Mississippi Energy Institute, 310 pp.

3. *Onshore Oil and Gas Infrastructure to Support Development in the Mid-Atlantic OCS Region. (2014).* U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2014-657. 360 pp.

4. *Unconventional Resources and Louisiana’s Manufacturing Development Renaissance* (2013). Baton Rouge, LA: LSU Center for Energy Studies, 93 pp.

5. *Removing Big Wind’s “Training Wheels:” The Case for Ending the Production Tax Credit* (2012). Washington, DC: American Energy Alliance, 19 pp.

6. *The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana*. (2012). Baton Rouge, LA: LSU Center for Energy Studies, 62 pp.

7. *Diversifying Energy Industry Risk in the GOM: Post-2004 Changes in Offshore Oil and Gas Insurance Markets*. (2011) With Christopher P. Peters. U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico Region, New Orleans, LA. OCS Study BOEM 2011-054. 95pp.

8. *OCS-Related Infrastructure Fact Book. Volume I: Post-Hurricane Impact Assessment*. (2011). U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico Region, New Orleans, LA. OCS Study BOEM 2011-043. 372 pp.

9. *Fact Book: Offshore Oil and Gas Industry Support Sectors*. (2010). U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico Region, New Orleans, LA. OCS Study BOEM 2010-042. 138pp.

10. *The Impacts of Greenhouse Gas Regulation on the Louisiana Economy*. (2011). With Michael D. McDaniel, Christopher Peters, Kathryn R. Perry, and Lauren L. Stuart. Louisiana Greenhouse Gas Inventory Project, Task 3 and 4 Report. Prepared for the Louisiana Department of Economic Development. Baton Rouge, LA: LSU Center for Energy Studies, 134 pp.

11. *Overview of States’ Climate Action and/or Alternative Energy Policy Measures*. (2010). With Michael D. McDaniel, Christopher Peters, Kathryn R. Perry, and Lauren L. Stuart. Louisiana Greenhouse Gas Inventory Project, Task 2 Report. Prepared for the Louisiana Department of Economic Development. Baton Rouge, LA: LSU Center for Energy Studies, 30 pp.

12. *Louisiana Greenhouse Gas Inventory*. (2010). With Michael D. McDaniel, Christopher Peters, Kathryn R. Perry, Lauren L. Stuart, and Jordan L. Gilmore. Louisiana

Greenhouse Gas Inventory Project, Task 1 Report. Prepared for the Louisiana Department of Economic Development. Baton Rouge, LA: LSU Center for Energy Studies, 114 pp.

13. *Opportunities for Geo-pressured Thermal Energy in Southwestern Louisiana*. (2010). Report prepared on behalf of Louisiana Geothermal, L.L.C, 41 pp.

14. *Economic and Energy Market Benefits of the Proposed Cavern Expansions at the Jefferson Island Storage and Hub Facility*. (2009). Report prepared on behalf of Jefferson Island Storage and Hub, LLC, 28 pp.

15. *The Benefits of Continued and Expanded Investments in the Port of Venice*. (2009). With Christopher Peters and Kathryn Perry. Baton Rouge, LA: LSU Center for Energy Studies. 83 pp.

16. *Examination of the Development of Liquefied Natural Gas on the Gulf of Mexico*. (2008). U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA OCS Study MMS 2008-017. 106 pp.

17. *Gulf of Mexico OCS Oil and Gas Scenario Examination: Onshore Waste Disposal*. (2007). With Michelle Barnett, Derek Vitrano, and Kristen Strellec. OCS Report, MMS 2007-051. New Orleans, LA: U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico Region.

18. *Economic Impact Analysis of the Proposed Lake Charles Gasification Project*. (2007). Report Prepared on Behalf of Leucadia Corporation.

19. *The Economic Impacts of New Jersey's Proposed Renewable Portfolio Standard.* (2005) Report Prepared on Behalf of the New Jersey Division of Ratepayer Advocate.

20. *The Importance of Energy Production and Infrastructure in Plaquemines Parish*. (2006). Report Prepared on Behalf of Project Rebuild Plaquemines.

21. *Louisiana's Oil and Gas Industry: A Study of the Recent Deterioration in-State Drilling Activity*. (2005). With Kristi A.R. Darby, Jeffrey M. Burke, and Robert H. Baumann. Baton Rouge, LA: Louisiana Department of Natural Resources.

22. *Comparison of Methods for Estimating the NO_x Emission Impacts of Energy Efficiency and Renewable Energy Projects Shreveport, Louisiana Case Study*. (2005). With Adam Chambers, David Kline, Laura Vimmerstedt, Art Diem, and Dmitry Mesyanzhinov. Golden, Colorado: National Renewable Energy Laboratory.

23. *Economic Opportunities for a Limited Industrial Retail Choice Plan in Louisiana*. (2004). With Elizabeth A. Downer and Dmitry V. Mesyanzhinov. Baton Rouge, LA: Louisiana State University Center for Energy Studies.

24. *Economic Opportunities for LNG Development in Louisiana*. (2004). With Elizabeth A. Downer and Dmitry V. Mesyanzhinov. Baton Rouge, LA: Louisiana Department of Economic Development and Greater New Orleans, Inc.

25. *Marginal Oil and Gas Production in Louisiana: An Empirical Examination of State Activities and Policy Mechanisms for Stimulating Additional Production*. (2004). With Dmitry V. Mesyanzhinov, Jeffrey M. Burke, Robert H. Baumann. Baton Rouge, LA: Louisiana Department of Natural Resources, Office of Mineral Resources.

26. *Deepwater Program: OCS-Related Infrastructure in the Gulf of Mexico Fact Book.*

(2004). With Louis Berger Associates, University of New Orleans National Ports and Waterways Institute, and Research and Planning Associates. MMS Study No. 1435-01-99-CT-30955. U.S. Department of the Interior, Minerals Management Service.

27. *The Power of Generation: The Ongoing Benefits of Independent Power Development in Louisiana.* With Dmitry V. Mesyanzhinov, Jeffrey M. Burke, and Elizabeth A. Downer. Baton Rouge, LA: LSU Center for Energy Studies, 2003.

28. *Modeling the Economic Impact of Offshore Oil and Gas Activities in the Gulf of Mexico: Methods and Application.* (2003). With Williams O. Olatubi, Dmitry V. Mesyanzhinov, and Allan G. Pulsipher. Prepared by the Center for Energy Studies, Louisiana State University, Baton Rouge, LA. OCS Study MMS2000-0XX. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA.

29. *An Analysis of the Economic Impacts Associated with Oil and Gas Activities on State Leases*. (2002) With Robert H. Baumann, Dmitry V. Mesyanzhinov, and Allan G. Pulsipher. Baton Rouge, LA: Louisiana Department of Natural Resources, Office of Mineral Resources.

30. *Alaska In-State Natural Gas Demand Study*. (2002). With Dmitry Mesyanzhinov, et.al. Anchorage, Alaska: Alaska Department of Natural Resources, Division of Oil and Gas.

31. *Moving to the Front of the Lines: The Economic Impacts of Independent Power Plant Development in Louisiana*. (2001). With Dmitry Mesyanzhinov and Williams O. Olatubi. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

32. *The Economic Impacts of Merchant Power Plant Development in Mississippi.* (2001). Report Prepared on Behalf of the US Oil and Gas Association, Alabama and Mississippi Division. Houston, TX: Econ One Research, Inc.

33. *Energy Conservation and Electric Restructuring In Louisiana*. (2000). With Dmitry Mesyanzhinov, Ritchie D. Priddy, Robert F. Cope III, and Vera Tabakova. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

34. *Assessing the Environmental and Safety Risks of the Expanded Role of Independents in Oil and Gas E&P Operations on the U.S. Gulf of Mexico OCS.* (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

35. *Restructuring the Electric Utility Industry: Implications for Louisiana.* (1996). With Allan Pulsipher and Kimberly H. Dismukes. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

GRANT RESEARCH

1. *Co-Principal Investigator*. Gulf coast energy outlook and analysis. (2016). With Gregory B. Upton and Mallory Vachon. Regions Bank. Total funding: $20,000, one year. Status: In progress.

2. *Principal Investigator*. GOM energy infrastructure trends and factbook update. (2016). With Gregory B. Upton and Mallory Vachon. U.S. Department of the Interior, Bureau of Ocean Energy Management ("BOEM"). Total funding: $224,995, two years. Status: In progress.

3. *Principal Investigator*. Examining Louisiana's Industrial Carbon Sequestration Potential.

Phase 1: Scoping and Identification. (2016). With Brian F. Snyder. Southern States Energy Board. Total Project: $29,919, three months. Status: In progress.

4. *Principal Investigator*. Energy efficiency building codes for Louisiana. (2016). With Brian F. Snyder. Louisiana Department of Natural Resources. Total Project: $50,000, one year. Status: In progress.

5. *Principal Investigator*. An update of Louisiana's combined heat and power potentials, current utilizations, and barriers to improved operating efficiencies. (2016). Louisiana Department of Natural Resources. Total Project: $90,000, one year. Status: In progress.

6. *Co-Investigator*. "Expanding Ecosystem Service Provisioning from Coastal Restoration to Minimize Environmental and Energy Constraints" (2015). With John Day and Chris D'Elia. Gulf Research Program. Total Project: $147,937. Status: In Progress.

7. *Principal Investigator*. "Coastal Marine Institute Administrative Grant" (2104). U.S. Department of the Interior. Total Project $45,000. Status: In Progress.

8. *Principal Investigator*. "Analysis of the Potential for Combined Heat and Power (CHP) in Louisiana." (2013). Louisiana Department of Natural Resources. Total Project: $90,000. Status: Completed.

9. *Co-Investigator*. "CNH: A Tale of Two Louisianas: Coupled Natural-Human Dynamics in a Vulnerable Coastal System" (2013) With Nina Lam, Margaret Reams, Kam-Biu Liu, Victor Rivera, and Kelley Pace. National Science Foundation. Total Project: $1.5 million. Status: In Progress (Sept 2012-Feb 2017).

10. *Principal Investigator*. "Examination of Unconventional Natural Gas and Industrial Economic Development" (2012). America's Natural Gas Alliance. Total Project: $48,210. Status: Completed.

11. *Principal Investigator*. "Investigation of the Potential Economic Impacts Associated with Shell's Proposed Gas-To-Liquids Project" (2012). Shell Oil Company, North America. Total Project: $76,708. Status: Completed.

12. *Principal Investigator*. "Analysis of the Federal Wind Energy Production Tax Credit." American Energy Alliance. Total Project: $20,000. Status: Completed.

13. *Principal Investigator*. "Energy Sector Impacts Associated with the Deepwater Horizon Oil Spill." Louisiana Department of Economic Development. Total Project: approximately $50,000. Status: Completed.

14. *Principal Investigator*. "Economic Contributions and Benefits Support by the Port of Venice." Port of Venice Coalition. Total Project: $20,000. Status: Completed.

15. *Principal Investigator.* "Energy Policy Development in Louisiana." Louisiana Department of Natural Resources. Total Project: $150,000. Status: Completed.

16. *Principal Investigator.* "Preparing Louisiana for the Possible Federal Regulation of Greenhouse Gas Regulation." With Michael D. McDaniel. Louisiana Department of Economic Development. Total Project: $98,543. Status: Completed.

17. *Principal Investigator*. "OCS Studies Review: Louisiana and Texas Oil and Gas Activity and Production Forecast; Pipeline Position Paper; and Geographical Units for Observing and Modeling Socioeconomic Impact of Offshore Activity." (2008). With Mark J. Kaiser

and Allan G. Pulsipher. U.S. Department of the Interior, Minerals Management Service. Total Project: $377,917 (3 years). Status: Completed.

18. *Principal Investigator*. “State and Local Level Fiscal Effects of the Offshore Petroleum Industry.” (2007). With Loren C. Scott. U.S. Department of the Interior, Minerals Management Service. Total Project: $241,216 (2.5 years). Status: Completed.

19. *Principal Investigator*. “Understanding Current and Projected Gulf OCS Labor and Ports Needs.” (2007). With Allan. G. Pulsipher, Kristi A. R. Darby. U.S. Department of the Interior, Minerals Management Service. Total Project: $169,906. (one year). Status: Completed.

20. *Principal Investigator*. “Structural Shifts and Concentration of Regional Economic Activity Supporting GOM Offshore Oil and Gas Activities.” (2007). With Allan. G. Pulsipher, Michelle Barnett. U.S. Department of the Interior, Minerals Management Service. Total Project: $78,374 (one year). Status: Awarded, In Progress.

21. *Principal Investigator*. “Plaquemine Parish’s Role in Supporting Critical Energy Infrastructure and Production.” (2006). With Seth Cureington. Plaquemines Parish Government, Office of the Parish President and Plaquemines Association of Business and Industry. Total Project: $18,267. Status: Completed.

22. *Principal Investigator*. “Diversifying Energy Industry Risk in the Gulf of Mexico.” (2006). With Kristi A. R. Darby. U.S. Department of the Interior, Minerals Management Service. Total Project: $65,302 (two years). Status: Awarded, In Progress.

23. *Principal Investigator*. “Post-Hurricane Assessment of OCS-Related Infrastructure and Communities in the Gulf of Mexico Region.” (2006). U.S. Department of the Interior, Minerals Management Service. Total Project Funding: $244,837. Status: In Progress.

24. *Principal Investigator*. “Ultra-Deepwater Road Mapping Process.” (2005). With Kristi A. R. Darby, Subcontract with the Texas A&M University, Department of Petroleum Engineering. Funded by the Gas Technology Institute. Total Project Funding: $15,000. Status: Completed.

25. *Principal Investigator*. “An Examination of the Opportunities for Drilling Incentives on State Leases.” (2004). With Robert H. Baumann and Kristi A. R. Darby. Louisiana Office of Mineral Resources. Total Project Funding: $75,000. Status: Completed.

26. *Principal Investigator*. “ An Examination on the Development of Liquefied Natural Gas Facilities on the Gulf of Mexico.“ (2004). With Dmitry V. Mesyanzhinov and Mark J. Kaiser. U.S. Department of the Interior, Minerals Management Service. Total Project Funding $101,054. Status: Completed.

27. *Principal Investigator*. “Examination of the Economic Impacts Associated with Large Customer, Industrial Retail Choice.” (2004). With Dmitry V. Mesyanzhinov. Louisiana Mid-Continent Oil and Gas Association. Total Project Funding: $37,000. Status: Completed.

28. *Principal Investigator*. “Economic Opportunities from LNG Development in Louisiana.” (2003). With Dmitry V. Mesyanzhinov. Metrovision/New Orleans Chamber of Commerce and the Louisiana Department of Economic Development. Total Project Funding: $25,000. Status: Completed.

29. *Principal Investigator*. “Marginal Oil and Gas Properties on State Leases in Louisiana:

An Empirical Examination and Policy Mechanisms for Stimulating Additional Production." (2002). With Robert H. Baumann and Dmitry V. Mesyanzhinov. Louisiana Office of Mineral Resources. Total Project Funding: $72,000. Status: Completed.

30. *Principal Investigator*. "A Collaborative Investigation of Baseline and Scenario Information for Environmental Impact Statements." (2002). With Dmitry V. Mesyanzhinov and Williams O. Olatubi. U.S. Department of Interior, Minerals Management Service. Total Project Funding: $557,744. Status: Awarded, In Progress.

31. *Co-Principal Investigator*. "An Analysis of the Economic Impacts of Drilling and Production Activities on State Leases." (2002). With Robert H. Baumann, Allan G. Pulsipher, and Dmitry V. Mesyanzhinov. Louisiana Office of Mineral Resources. Total Project Funding: $8,000. Status: Completed.

32. *Principal Investigator*. "Cost Profiles and Cost Functions for Gulf of Mexico Oil and Gas Development Phases for Input Output Modeling." (1998). With Dmitry Mesyanzhinov and Allan G. Pulsipher. U.S. Department of Interior, Minerals Management Service. Total Project Funding: $244,956. Status: Completed.

33. *Principal Investigator*. "An Economic Impact Analysis of OCS Activities on Coastal Louisiana." (1998). With Dmitry Mesyanzhinov and David Hughes. U.S. Department of Interior, Minerals Management Service. Total Project Funding: $190,166. Status: Completed.

34. *Principal Investigator*. "Energy Conservation and Electric Restructuring in Louisiana." (1997). Louisiana Department of Natural Resources." Petroleum Violation Escrow Program Funds. Total Project Funding: $43,169. Status: Completed.

35. *Principal Investigator*. "The Industrial Supply of Electricity: Commercial Generation, Self-Generation, and Industry Restructuring." (1996). With Andrew Kleit. Louisiana Energy Enhancement Program, LSU Office of Research and Development. Total Project Funding: $19,948. Status: Completed.

36. *Co-Principal Investigator*. "Assessing the Environmental and Safety Risks of the Expanded Role of Independents in Oil and Gas E&P Operations on the U.S. Gulf of Mexico OCS." (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, Grant Number 95-0056. Total Project Funding: $109,361. Status: Completed.

ACADEMIC CONFERENCE PAPERS/PRESENTATIONS

1. "The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks." (2015). With Gregory Upton. Southern Economic Association Meeting 2015. New Orleans, Louisiana. November 23.

2. "The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks" (2015). With Gregory Upton. 38th IAEE International Conference, Antalya, Turkey. May 26.

3. "Modifying Renewables Policies to Sustain Positive Economic and Environmental Change" (2015). IEEE Annual Green Technologies ("Greentech") Conference. April 17.

4. "The Gulf Coast Industrial Investment Renaissance and New CHP Development Opportunities." (2014). Industrial Energy and Technology Conference, New Orleans,

Louisiana. May 20.

5. “Estimating Critical Energy Infrastructure Value at Risk from Coastal Erosion” (2014). With Siddhartha Narra. American’s Estuaries: 7th Annual Summit on Coastal and Estuarine Habitat Restoration. Washington, D.C., November 3-6.

6. “Economies of Scale, Learning Curves, and Offshore Wind Development Costs” (2012). With Gregory Upton. Southern Economic Association Annual Conference, New Orleans, LA November 17.

7. “Analysis of Risk and Post-Hurricane Reaction.” (2009). 25th Annual Information Transfer Meeting. U.S. Department of the Interior, Minerals Management Service. January 7.

8. “Legacy Litigation, Regulation, and Other Determinants of Interstate Drilling Activity Differentials.” (2008). With Christopher Peters and Mark Kaiser. 28th Annual USAEE/IAEE North American Conference: Unveiling the Future of Future of Energy Frontiers. New Orleans, LA, December 3.

9. “Gulf Coast Energy Infrastructure Renaissance: Overview.” (2008). 28th Annual USAEE/IAEE North American Conference: Unveiling the Future of Future of Energy Frontiers. New Orleans, LA, December 3.

10. “Understanding the Impacts of Katrina and Rita on Energy Industry Infrastructure.” (2008). American Chemical Society National Meetings, New Orleans, Louisiana. April 7.

11. "Determining the Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2007). With Kristi A. R. Darby and Michelle Barnett. International Association for Energy Economics, Wellington, New Zealand, February 19.

12. “Regulatory Issues in Rate Design, Incentives, and Energy Efficiency.” (2007). 34th Annual Public Utilities Research Center Conference, University of Florida. Gainesville, FL. February 16.

13. “An Examination of LNG Development on the Gulf of Mexico.” (2007). With Kristi A.R. Darby. US Department of the Interior, Minerals Management Service. 24th Annual Information Technology Meeting. New Orleans, LA. January 9.

14. “OCS-Related Infrastructure on the GOM: Update and Summary of Impacts.” (2007). US Department of the Interior, Minerals Management Service. 24th Annual Information Technology Meeting. New Orleans, LA. January 10.

15. “The Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure.” (2006). With Michelle Barnett. Third National Conference on Coastal and Estuarine Habitat Restoration. Restore America’s Estuaries. New Orleans, Louisiana, December 11.

16. “The Impact of Implementing a 20 Percent Renewable Portfolio Standard in New Jersey.” (2006). With Seth E. Cureington. Mid-Continent Regional Science Association 37th Annual Conference, Purdue University, Lafayette, Indiana, June 9.

17. “The Impacts of Hurricane Katrina and Rita on Energy infrastructure Along the Gulf Coast.” (2006). Environment Canada: 2006 Artic and Marine Oilspill Program. Vancouver, British Columbia, Canada.

18. “Hurricanes, Energy Markets, and Energy Infrastructure in the Gulf of Mexico: Experiences and Lessons Learned.” (2006). With Kristi A.R. Darby and Seth E. Cureington. 29th Annual IAEE International Conference, Potsdam, Germany, June 9.

19. “An Examination of the Opportunities for Drilling Incentives on State Leases in Louisiana.” (2005). With Kristi A.R. Darby. 28th Annual IAEE International Conference, Taipei, Taiwan (June).

20. “Fiscal Mechanisms for Stimulating Oil and Gas Production on Marginal Leases.” (2004). With Jeffrey M. Burke. International Association of Energy Economics Annual Conference, Washington, D.C. (July).

21. “GIS and Applied Economic Analysis: The Case of Alaska Residential Natural Gas Demand.” (2003). With Dmitry V. Mesyanzhinov. Presented at the Joint Meeting of the East Lakes and West Lakes Divisions of the Association of American Geographers in Kalamazoo, MI, October 16-18.

22. “Are There Any In-State Uses for Alaska Natural Gas?” (2002). With Dmitry V. Mesyanzhinov and William E. Nebesky. IAEE/USAEE 22nd Annual North American Conference: “Energy Markets in Turmoil: Making Sense of It All.” Vancouver, British Columbia, Canada. October 7.

23. “The Economic Impact of State Oil and Gas Leases on Louisiana.” (2002). With Dmitry V. Mesyanzhinov. 2002 National IMPLAN Users’ Conference. New Orleans, Louisiana, September 4-6.

24. “Moving to the Front of the Lines: The Economic Impact of Independent Power Plant Development in Louisiana.” (2002). With Dmitry V. Mesyanzhinov and Williams O. Olatubi. 2002 National IMPLAN Users’ Conference. New Orleans, Louisiana, September 4-6.

25. “New Consistent Approach to Modeling Regional Economic Impacts of Offshore Oil and Gas Activities in the Gulf of Mexico.” (2002). With Vicki Zatarain. 2002 National IMPLAN Users’ Conference. New Orleans, Louisiana, September 4-6.

26. “Distributed Energy Resources, Energy Efficiency, and Electric Power Industry Restructuring.” (1999). American Society of Environmental Science Fourth Annual Conference. Baton Rouge, Louisiana. December.

27. “Estimating Efficiency Opportunities for Coal Fired Electric Power Generation: A DEA Approach.” (1999). With Williams O. Olatubi. Southern Economic Association Sixty-ninth Annual Conference. New Orleans, November.

28. "Applied Approaches to Modeling Regional Power Markets." (1999.) With Robert F. Cope. Southern Economic Association Sixty-ninth Annual Conference. New Orleans, November 1999.

29. “Parametric and Non-Parametric Approaches to Measuring Efficiency Potentials in Electric Power Generation.” (1999). With Williams O. Olatubi. International Atlantic Economic Society Annual Conference, Montreal, October.

30. “Asymmetric Choice and Customer Benefits: Lessons from the Natural Gas Industry.” (1999). With Rachelle F. Cope and Dmitry Mesyanzhinov. International Association of Energy Economics Annual Conference. Orlando, Florida. August.

31. “Modeling Regional Power Markets and Market Power.” (1999). With Robert F. Cope. Western Economic Association Annual Conference. San Diego, California. July.

32. “Economic Impact of Offshore Oil and Gas Activities on Coastal Louisiana” (1999). With Dmitry Mesyanzhinov. Annual Meeting of the Association of American Geographers. Honolulu, Hawaii. March.

33. “Empirical Issues in Electric Power Transmission and Distribution Cost Modeling.” (1998). With Robert F. Cope and Dmitry Mesyanzhinov. Southern Economic Association. Sixty-Eighth Annual Conference. Baltimore, Maryland. November.

34. “Modeling Electric Power Markets in a Restructured Environment.” (1998). With Robert F. Cope and Dan Rinks. International Association for Energy Economics Annual Conference. Albuquerque, New Mexico. October.

35. “Benchmarking Electric Utility Distribution Performance.” (1998) With Robert F. Cope and Dmitry Mesyanzhinov. Western Economic Association, Seventy-sixth Annual Conference. Lake Tahoe, Nevada. June.

36. “Power System Operations, Control, and Environmental Protection in a Restructured Electric Power Industry.” (1998). With Fred I. Denny. IEEE Large Engineering Systems Conference on Power Engineering. Nova Scotia, Canada. June.

37. “Benchmarking Electric Utility Transmission Performance.” (1997). With Robert F. Cope and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-seventh Annual Conference. Atlanta, Georgia. November 21-24.

38. “A Non-Linear Programming Model to Estimate Stranded Generation Investments in a Deregulated Electric Utility Industry.” (1997). With Robert F. Cope and Dan Rinks. Institute for Operations Research and Management Science Annual Conference. Dallas Texas. October 26-29.

39. “New Paradigms for Power Engineering Education.” (1997). With Fred I. Denny. International Association of Science and Technology for Development, High Technology in the Power Industry Conference. Orlando, Florida. October 27-30

40. “Cogeneration and Electric Power Industry Restructuring.” (1997). With Andrew N. Kleit. Western Economic Association, Seventy-fifth Annual Conference. Seattle, Washington. July 9-13.

41. “The Unintended Consequences of the Public Utilities Regulatory Policies Act of 1978.” (1997). National Policy History Conference on the Unintended Consequences of Policy Decisions. Bowling Green State University. Bowling Green, Ohio. June 5-7.

42. “Assessing Environmental and Safety Risks of the Expanding Role of Independents in E&P Operations on the Gulf of Mexico OCS.” (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, 16th Annual Information Transfer Meeting. New Orleans, Louisiana.

43. “Empirical Modeling of the Risk of a Petroleum Spill During E&P Operations: A Case Study of the Gulf of Mexico OCS.” (1996). With Omowumi Iledare, Allan Pulsipher, and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.

44. “Input Price Fluctuations, Total Factor Productivity, and Price Cap Regulation in the Telecommunications Industry” (1996). With Farhad Niami. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.

45. “Recovery of Stranded Investments: Comparing the Electric Utility Industry to Other Recently Deregulated Industries” (1996). With Farhad Niami and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.

46. “Spatial Perspectives on the Forthcoming Deregulation of the U.S. Electric Utility Industry.” (1996) With Dmitry Mesyanzhinov. Southwest Association of American Geographers Annual Meeting. Norman, Oklahoma.

47. “Comparing the Safety and Environmental Performance of Offshore Oil and Gas Operators.” (1995). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, 15th Annual Information Transfer Meeting. New Orleans, Louisiana.

48. “Empirical Determinants of Nuclear Power Plant Disallowances.” (1995). Southern Economic Association, Sixty-Fifth Annual Conference. New Orleans, Louisiana.

49. “A Cross-Sectional Model of IntraLATA MTS Demand.” (1995). Southern Economic Association, Sixty-Fifth Annual Conference. New Orleans, Louisiana.

ACADEMIC SEMINARS AND PRESENTATIONS

1. “Air Emissions Regulation and Policy: The Recently Proposed Cross State Air Pollution Rule and the Implications for Louisiana Power Generation.” Lecture before School of the Coast & Environment. November 5, 2011.

2. “Energy Regulation: Overview of Power and Gas Regulation.” Lecture before School of the Coast & Environment, Course in Energy Policy and Law. October 5, 2009.

3. “Trends and Issues in Renewable Energy.” Presentation before the School of the Coast & Environment, Louisiana State University. Spring Guest Lecture Series. May 4, 2007.

4. “CES Research Projects and Status.” Presentation before the U.S. Department of the Interior, Minerals Management Service, Outer Continental Shelf Scientific Committee Meeting, New Orleans, LA May 22, 2007.

5. “Hurricane Impacts on Energy Production and Infrastructure.” Presentation Before the 53rd Mineral Law Institute, Louisiana State University. April 7, 2006.

6. “Trends and Issues in the Natural Gas Industry and the Development of LNG: Implications for Louisiana. (2004) 51st Mineral Law Institute, Louisiana State University, Baton Rouge, LA. April 2, 2004.

7. “Electric Restructuring and Conservation.” (2001). Presentation before the Department of Electrical Engineering, McNesse State University. Lake Charles, Louisiana. May 2, 2001.

8. “Electric Restructuring and the Environment.” (1998). Environment 98: Science, Law, and Public Policy. Tulane University. Tulane Environmental Law Clinic. March 7, New Orleans, Louisiana.

9. “Electric Restructuring and Nuclear Power.” (1997). Louisiana State University. Department of Nuclear Science. November 7, Baton Rouge, Louisiana.

10. “The Empirical Determinants of Co-generated Electricity: Implications for Electric Power Industry Restructuring.” (1997). With Andrew N. Kleit. Florida State University. Department of Economics: Applied Microeconomics Workshop Series. October 17, Tallahassee, Florida.

PROFESSIONAL AND CIVIC PRESENTATIONS

1. “Critical energy infrastructure: the big picture on resiliency research.” (2017). National Academies of Science, Engineering, and Medicine. New Orleans, LA. September 18.
2. “The changing nature of Gulf of Mexico energy infrastructure.” (2017). Session 3B: New Directions in Social Science Research. 27th Gulf of Mexico Region Information Technology Meetings. New Orleans, LA. August 24.
3. “Crude oil and natural gas outlook: Where are we and where are we going?” (2017). CCREDC Economic Trends Panel. Corpus Christi, TX, June 15.
4. “Navigating through the energy landscape.” (2017). Baton Rouge Rotary Luncheon. Baton Rouge, LA, May 24.
5. “The 2017-2018 Louisiana energy outlook.” (2017). Junior Achievement of Greater New Orleans, JA BizTown Speaker Series. New Orleans, LA, May 12.
6. “The Gulf Coast energy economy: trends and outlook.” (2017). Society for Municipal Analysts. New Orleans, LA, April 21.
7. “Recent trends in energy: overview and impact for the banking community.” (2017). Oil and Gas Industry Update, Louisiana Bankers Association. Baton Rouge, LA, March 24.
8. “How supply, demand and prices have influenced unconventional development.” (2016). Energy Annual Meeting, CLEER-University Advisory Board Lecture. New Orleans, LA, September 17.
9. “The Basics of Natural Gas Production, Transportation, and Markets.” (2016). Center for Energy Studies. Baton Rouge, LA, August 1.
10. “Gulf Coast industrial development: trends and outlook.” (2016). Investor Relations Group Meeting, Edison Electric Institute. New Orleans, LA, June 23.
11. “The future of policy and regulation: Unlocking the Treasures of Utility Regulation.” (2016). Annual Meeting, National Conference of Regulatory Attorneys. Tampa, FL, June 20.
12. “Utility mergers: where’s the beef?”. (2016). National Association of State Utility Consumer Advocates Mid-Year Meetings. New Orleans, LA, June 6.
13. “Overview of the Clean Power Plan and its application to Louisiana.” (2016). Shell Oil Company Internal Meeting. April 12.
14. “Energy and economic development on the Gulf Coast: trends and emerging challenges.” (2016). Gas Processors Association Meeting. New Orleans, LA, April 11.
15. “Unconventional Oil and Gas Drilling Trends and Issues.” (2016). French Delegation Visit, LSU Center for Energy Studies. March 16.
16. “Gulf Coast Industrial Growth: Passing clouds or storms on the horizon?” (2016). Gulf Coast Power Association Meetings. New Orleans, LA, February 18.

17. “The Transition to Crisis: What do the recent changes in energy markets mean for Louisiana?” (2016). Louisiana Independent Study Group. February 2.

18. “Regulatory and Ratepayer Issues in the Analysis of Utility Natural Gas Reserves Purchases” (2016). National Association of State Utility Consumer Advocates Gas Consumer Monthly Meeting. January 25.

19. “Emerging Issues in Fuel Procurement: Opportunities & Challenges in Natural Gas Reserves Investment.” (2015). National Association of State Utility Consumer Advocates Annual Meeting. Austin, Texas. November 9.

20. “Trends and Issues in Net Metering and Solar Generation.” (2015). Louisiana Rural Electric Cooperative Meeting. November 5.

21. “Electric Power: Industry Overview, Organization, and Federal/State Distinctions.” (2015). EUCI. October 16.

22. “Natural Gas 101: The Basics of Natural Gas Production, Transportation, and Markets.” (2015). Council of State Governments Special Meeting on Gas Markets. New Orleans, LA. October 14.

23. “Update and General Business Matters.” (2015). CES Industry Associates Meeting. Baton Rouge, Louisiana. Fall 2015.

24. “The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks.” (2015). 38th IAEE 2015 International Conference. Antalya, Turkey. May 26.

25. “Industry on the Move – What’s Next?” (2015). Event Sponsored by Regional Bank and 1012 Industry Report. May 5.

26. “The State of the Energy Industry and Other Emerging Issues.” (2015). Lex Mundi Energy & Natural Resources Practice Group Global Meeting. May 5.

27. “Energy, Louisiana, and LSU.” (2015). LSU Science Café. Baton Rouge, Louisiana. April 28.

28. “Energy Market Changes and Impacts for Louisiana.” (2015). Kinetica Partners Shippers Meeting, New Orleans, Louisiana. April 22.

29. “Incentives, Risk and the Changing Nature of Utility Regulation.” (2015). NARUC Staff Subcommittee on Accounting and Finance Meetings, New Orleans, Louisiana. April 22.

30. “Modifying Renewables Policies to Sustain Positive and Economic Change.” (2015). IEEE Annual Green Technologies (“Greentech Conference”). April 17.

31. “Louisiana’s Changing Energy Environment.” (2015). John P. Laborde Energy Law Center Advisory Board Spring Meeting, Baton Rouge, Louisiana. March 27.

32. “The Latest and the Long on Energy: Outlooks and Implications for Louisiana.” (2015). Iberia Bank Advisory Board Meeting, Baton Rouge, Louisiana. February 23.

33. “A Survey of Recent Energy Market Changes and their Potential Implications for Louisiana.” (2015). Vistage Group, New Orleans, Louisiana. February 4.

34. “Energy Prices and the Outlook for the Tuscaloosa Marine Shale.” (2015). Baton Rouge Rotary Club, Baton Rouge, Louisiana. January 28.

35. “Trends in Energy & Energy-Related Economic Development.” (2014). Miller and

Thompson Presentation, Baton Rouge, Louisiana. December 30.

36. “Overview EPA’s Proposed Rule Under Section 111(d) of the Clean Air Act: Impacts for Louisiana.” (2014). Louisiana State Bar: Utility Section CLE Annual Meeting, Baton Rouge, Louisiana. November 7.

37. “Overview EPA’s Proposed Clean Power Plan and Impacts for Louisiana.” (2014). Clean Cities Coalition Meeting, Baton Rouge, Louisiana. November 5.

38. “Impacts on Louisiana from EPA’s Proposed Clean Power Plan.” (2014). Air & Waste Management Annual Environmental Conference (Louisiana Chapter), Baton Rouge, Louisiana. October 29, 2014.

39. “A Look at America’s Growing Demand for Natural Gas.” (2014). Louisiana Chemical Association Annual Meeting, New Orleans, Louisiana. October 23.

40. “Trends in Energy & Energy-Related Economic Development.” (2014). 2014 Government Finance Officer Association Meetings, Baton Rouge, Louisiana. October 9.

41. “The Conventional Wisdom Associated with Unconventional Resource Development.” (2014). National Association for Business Economics Annual Conference, Chicago, Illinois. September 28.

42. Unconventional Oil & Natural Gas: Overview of Resources, Economics & Policy Issues. (2014). Society of Environmental Journalists Annual Meeting. New Orleans, Louisiana. September 4.

43. “Natural Gas Leveraged Economic Development in the South.” (2014). Southern Governors Association Meeting, Little Rock, Arkansas. August 16.

44. “The Past, Present and Future of CHP Development in Louisiana.” (2014). Louisiana Public Service Commission CHP Workshop, Baton Rouge, Louisiana. June 25.

45. “Regional Natural Gas Demand Growth: Industrial and Power Generation Trends.” (2014). Kinetica Partners Shippers Meeting, New Orleans, Louisiana. April 30.

46. “The Technical and Economic Potential for CHP in Louisiana and the Impact of the Industrial Investment Renaissance on New CHP Capacity Development.” (2014). Electric Power 2014, New Orleans, Louisiana. April 1.

47. “Industry Investments and the Economic Development of Unconventional Development.” (2014). Tuscaloosa Marine Shale Conference & Expo, Natchez, Mississippi. March 31.

48. Discussion Panelist. Energy Outlook 2035: The Global Energy Industry and Its Impact on Louisiana, (2014). Grow Louisiana Coalition, Baton Rouge, Louisiana. March 18.

49. “Natural Gas and the Polar Vortex: Has Recent Weather Led to a Structural Change in Natural Gas Markets?” (2014). National Association of Statue Utility Consumer Advocates Monthly Gas Committee Meeting. February 19.

50. “Some Unconventional Thoughts on Regional Unconventional Gas and Power Generation Requirements.” (2014). Gulf Coast Power Association Special Briefing, New Orleans, Louisiana. February 6.

51. “Leveraging Energy for Industrial Development.” (2013). 2013 Governor’s Energy Summit, Jackson, Mississippi. December 5.

52. “Natural Gas Line Extension Policies: Ratepayer Issues and Considerations.” (2013).

National Association of Statue Utility Consumer Advocates Annual Meeting, Orlando, Florida. November 19.

53. "Replacement, Reliability & Resiliency: Infrastructure & Ratemaking Issues in the Power & Natural Gas Distribution Industries." (2013). Louisiana State Bar, Public Utility Section Meetings. November 15.

54. "Natural Gas Markets: Leveraging the Production Revolution into an Industrial Renaissance." (2013). International Technical Conference, Houston, TX. October 11.

55. "Natural Gas, Coal & Power Generation Issues and Trends." (2013). Southeast Labor and Management Public Affairs Committee Conference, Chattanooga, Tennessee. September 27.

56. "Recent Trends in Pipeline Replacement Trackers." (2013). National Association of Statue Utility Consumer Advocates Monthly Gas Committee Meeting. September 19.

57. Discussion Panelist (2013). Think About Energy Summit, America's Natural Gas Alliance, Columbus Ohio. September 16-17.

58. "Future Test Years: Issues to Consider." (2013). National Regulatory Research Institute, Teleseminar on Future Test Years. August 28.

59. "Industrial Development Outlook for Louisiana." (2013). Louisiana Water Synergy Project Meetings, Jones Walker Law Firm, Baton Rouge, Louisiana. July 30.

60. "Natural Gas & Electric Power Coordination Issues and Challenges." (2013). Utilities State Government Organization Conference, Pointe Clear, Alabama. July 9.

61. "Natural Gas Market Issues & Trends." (2013). Western Conference of Public Service Commissioners, Santa Fe, New Mexico. June 3.

62. "Louisiana Unconventional Natural Gas and Industrial Redevelopment." (2013). Louisiana Chemical Association/Louisiana Chemical Industry Allianace Annual Legislative Conference, Baton Rouge, Louisiana. May 8.

63. "Infrastructure Cost Recovery Mechanism: Overview of Issues." (2013). Energy Bar Association Annual Meeting, Washington, D.C. May 1.

64. "GOM Offshore Oil and Gas." (2013). Energy Executive Roundtable, New Orleans, Louisiana. March 27.

65. "Louisiana Unconventional Natural Gas and Industrial Redevelopment." (2013). Risk Management Association Luncheon, March 21.

66. "Natural Gas Market Update and Emerging Issues." (2013). NASUCA Gas Committee Conference Call/Webinar, March 12.

67. "Unconventional Resources and Louisiana's Manufacturing Development Renaissance." (2013). Baton Rouge Press Club, De La Ronde Hall, Baton Rouge, LA, January 28.

68. "New Industrial Operations Leveraged by Unconventional Natural Gas." (2013) American Petroleum Institute-Louisiana Chapter. Lafayette, LA, Petroleum Club, January 14.

69. "What's Going on with Energy? How Unconventional Oil and Gas Development is Impacting Renewables, Efficiency, Power Markets, and All that Other Stuff." (2012). Atlanta Economics Club Monthly Meeting. Atlanta, GA. December 11.

70. “Trends, Issues, and Market Changes for Crude Oil and Natural Gas.” (2012). East Iberville Community Advisory Panel Meeting. St. Gabriel, LA. September 26.

71. “Game Changers in Crude and Natural Gas Markets.” (2012). Chevron Community Advisory Panel Meeting. Belle Chase, LA, September 17.

72. “The Outlook for Renewables in a Changing Power and Natural Gas Market.” (2012). Louisiana Biofuels and Bioprocessing Summit. Baton Rouge, LA. September 11.

73. “The Changing Dynamics of Crude and Natural Gas Markets.” (2012). Chalmette Refining Community Advisory Panel Meeting. Chalmette, LA, September 11.

74. “The Really Big Game Changer: Crude Oil Production from Shale Resources and the Tuscaloosa Marine Shale.” (2012). Baton Rouge Chamber of Commerce Board Meeting. Baton Rouge, LA, June 27.

75. “The Impact of Changing Natural Gas Prices on Renewables and Energy Efficiency.” (2012). NASUCA Gas Committee Conference Call/Webinar. 12 June 2012.

76. “Issues in Gas-Renewables Coordination: How Changes in Natural Gas Markets Potentially Impact Renewable Development” (2012). Energy Bar Association, Louisiana Chapter, Annual Meeting, New Orleans, LA. April 12, 2012.

77. “Issues in Natural Gas End-Uses: Are We Really Focusing on the Real Opportunities?” (2012). Energy Bar Association, Louisiana Chapter, Annual Meeting, New Orleans, LA. April 12, 2012.

78. “The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana.” (2012). Louisiana Oil and Gas Association Annual Meeting, Lake Charles, LA. February 27, 2012.

79. “The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana.” (2012) Louisiana Oil and Gas Association Annual Meeting. Lake Charles, Louisiana. February 27, 2012.

80. “Louisiana’s Unconventional Plays: Economic Opportunities, Policy Challenges. Louisiana Mid-Continent Oil and Gas Association 2012 Annual Meeting. (2012) New Orleans, Louisiana. January 26, 2012.

81. “EPA’s Recently Proposed Cross State Air Pollution Rule (“CSAPR”) and Its Impacts on Louisiana.” (2011). Bossier Chamber of Commerce. November 18, 2011.

82. “Facilitating the Growth of America’s Natural Gas Advantage.” (2011). BASF U.S. Shale Gas Workshop Management Meeting. Florham Park, New Jersey. November 1, 2011.

83. “CSAPR and EPA Regulations Impacting Louisiana Power Generation.” (2011). Air and Waste Management Association (Louisiana Section) Fall Conference. Environmental Focus 2011: a Multi-Media Forum. Baton Rouge, LA. October 25, 2011.

84. “Natural Gas Trends and Impact on Industrial Development.” (2011). Central Gulf Coast Industrial Alliance Conference. Arthur R. Outlaw Convention Center. Mobile, AL. September 22, 2011.

85. “Energy Market Changes and Policy Challenges.” (2011). Southeast Manpower Tripartite Alliance (“SEMTA”) Summer Conference. Nashville, TN September 2, 2011.

86. “EPA Regulations, Rates & Costs: Implications for U.S. Ratepayers.” (2011). Workshop:

"A Smarter Approach to Improving Our Environment." 38th Annual American Legislative Exchange Council ("ALEC") Meetings. New Orleans, LA. August 5, 2011.

87. Panelist/Moderator. Workshop: "Why Wait? Start Energy Independence Today." 38th Annual American Legislative Exchange Council ("ALEC") Meetings. New Orleans, LA. August 4, 2011.

88. "Facilitating the Growth of America's Natural Gas Advantage." Texas Chemical Council, Board of Directors Summer Meeting. San Antonio, TX. July 28, 2011.

89. "Creating Ratepayer Benefits by Reconciling Recent Gas Supply Opportunities with Past Policy Initiatives." National Association of State Utility Consumer Advocates ("NASUCA"), Monthly Gas Committee Meeting. July 12, 2011.

90. "Energy Market Trends and Policies: Implications for Louisiana." (2011). Lakeshore Lion's Club Monthly Meeting. Baton Rouge, Louisiana. June 20, 2011.

91. "America's Natural Gas Advantage: Securing Benefits for Ratepayers Through Paradigm Shifts in Policy." Southeastern Association of Regulatory Commissioners ("SEARUC") Annual Meeting. Nashville, Tennessee. June 14, 2011.

92. "Learning Together: Building Utility and Clean Energy Industry Partnerships in the Southeast." (2011). American Solar Energy Society National Solar Conference. Raleigh Convention Center, Raleigh, North Carolina. May 20, 2011.

93. "Louisiana Energy Outlook and Trends." (2011). Executive Briefing. Counsul General of Canada. LSU Center for Energy Studies, Baton Rouge, Louisiana. May 24, 2011.

94. "Louisiana's Natural Gas Advantage: Can We Hold It? Grow It? Or Do We Need to be Worrying About Other Problems?" (2011). Louisiana Chemical Association Annual Legislative Conference, Baton Rouge, Louisiana, May 5, 2011.

95. "Energy Outlook and Trends: Implications for Louisiana. (2011). Executive Briefing, Legislative Staff, Congressman William Cassidy. LSU Center for Energy Studies, Baton Rouge, Louisiana. March 25, 2011.

96. "Regulatory Issues in Inflation Adjustment Mechanisms and Allowances." (2011). Gas Committee, National Association of State Utility Consumer Advocates ("NASUCA"). February 15, 2011.

97. "Regulatory Issues in Inflation Adjustment Mechanisms and Allowances." (2010). 2010 Annual Meeting, National Association of State Utility Consumer Advocates ("NASUCA"), Omni at CNN Center, Atlanta, Georgia, November 16, 2010.

98. "How Current and Proposed Energy Policy Impacts Consumers and Ratepayers." (2010). 122nd Annual Meeting, National Association of Regulatory Utility Commissioners ("NARUC"), Omni at CNN Center, Atlanta, Georgia, November 15, 2010.

99. "Energy Outlook: Trends and Policies." (2010). 2010 Tri-State Member Service Conference; Arkansas, Louisiana, and Mississippi Electric Cooperatives. L'Auberge du Lac Casino Resort, Lake Charles, Louisiana, October 14, 2010.

100. "Deepwater Moratorium and Louisiana Impacts." (2010). The Energy Council Annual Meeting. Gulf of Mexico Deepwater Horizon Accident, Response, and Policy. Beau Rivage Conference Center. Biloxi, Mississippi. September 25, 2010.

101. "Overview on Offshore Drilling and Production Activities in the Aftermath of Deepwater

Horizon." (2010) Jones Walker Banking Symposium. The Oil Spill: What Will it Mean for Banks in the Region? New Orleans, Louisiana. August 31, 2010.

102. "Long-Term Energy Sector Impacts from the Oil Spill." (2010). Second Annual Louisiana Oil & Gas Symposium. The BP Gulf Oil Spill: Long-Term Impacts and Strategies. Baton Rouge Geological Society. August 16, 2010.

103. "Overview and Issues Associated with the Deepwater Horizon Accident." (2010). Global Interdependence Meeting on Energy Issues. Baton Rouge, LA. August 12, 2010.

104. "Overview and Issues Associated with the Deepwater Horizon Accident." (2010). Regional Roundtable Webinar. National Association for Business Economics. August 10, 2010.

105. "Deepwater Moratorium: Overview of Impacts for Louisiana." Louisiana Association of Business and Industry Meeting. Baton Rouge, LA. June 25, 2010.

106. Moderator. Senior Executive Roundtable on Industrial Energy Efficiency. U.S. Department of Energy Conference on Industrial Efficiency. Office of Renewable Energy and Energy Efficiency. Royal Sonesta Hotel, New Orleans, LA. May 21, 2010.

107. "The Energy Outlook: Trends and Policies Impacting Southeastern Natural Gas Supply and Demand Growth." Second Annual Local Economic Analysis and Research Network ("LEARN") Conference. Federal Reserve Bank of Atlanta. March 29, 2010.

108. "Natural Gas Supply Issues: Gulf Coast Supply Trends and Implications for Louisiana." Energy Bar Association, New Orleans Chapter Meeting. Jones Walker Law Firm. January 28, 2010, New Orleans, LA.

109. "Potential Impacts of Federal Greenhouse Gas Legislation on Louisiana Industry." LCA Government Affairs Committee Meeting. November 10, 2009. Baton Rouge, LA

110. "Regulatory and Ratemaking Issues Associated with Cost and Revenue Tracker Mechanisms." National Association of State Utility Consumer Advocates ("NASUCA") Annual Meeting. November 10, 2009.

111. "Louisiana's Stakes in the Greenhouse Gas Debate." Louisiana Chemical Association and Louisiana Chemical Industry Alliance Annual Meeting: The Billing Dollar Budget Crisis: Catastrophe or Change? New Orleans, LA.

112. "Gulf Coast Energy Outlook: Issues and Trends." Women's Energy Network, Louisiana Chapter. September 17, 2009. Baton Rouge, LA.

113. "Gulf Coast Energy Outlook: Issues and Trends." Natchez Area Association of Energy Service Companies. September 15, 2009, Natchez, MS.

114. "The Small Picture: The Cost of Climate Change to Louisiana." Louisiana Association of Business and Industry, U.S. Chamber of Commerce, Louisiana Oil and Gas Association, and LSU Center for Energy Studies Conference: Can Louisiana Make a Buck After Climate Change Legislation? August 21, 2009. Baton Rouge, LA.

115. "Carbon Legislation and Clean Energy Markets: Policy and Impacts." National Association of Conservation Districts, South Central Region Meeting. August 14, 2009. Baton Rouge, LA.

116. "Evolving Carbon and Clean Energy Markets." The Carbon Emissions Continuum: From Production to Consumption." Jones Walker Law Firm and LSU Center for Energy

Studies Workshop. June 23, 2009. Baton Rouge, LA

117. "Potential Impacts of Cap and Trade on Louisiana Ratepayers: Preliminary Results." (2009). Briefing before the Louisiana Public Service Commission. Business and Executive Meeting, May 12, 2009. Baton Rouge, LA.

118. "Natural Gas Outlook." (2009). Briefing before the Louisiana Public Service Commission. Business and Executive Meeting, May 12, 2009. Baton Rouge, LA.

119. "Gulf Coast Energy Outlook: Issues and Trends." (2009). ISA-Lafayette Technical Conference & Expo. Cajundome Conference Center. Lafayette, Louisiana. March 12, 2009.

120. "The Cost of Energy Independence, Climate Change, and Clean Energy Initiatives on Utility Ratepayers." (2009). National Association of Business Economics (NABE). 25th Annual Washington Economic Policy Conference: Restoring Financial and Economic Stability. Arlington, VA March 2, 2009.

121. Panelist, "Expanding Exploration of the U.S. OCS" (2009). Deep Offshore Technology International Conference and Exhibition. PennWell. New Orleans, Louisiana. February 4, 2009.

122. "Gulf Coast Energy Outlook." (2008.) Atmos Energy Regional Management Meeting. Louisiana and Mississippi Division. New Orleans, Louisiana. October 8, 2008.

123. "Background, Issues, and Trends in Underground Hydrocarbon Storage." (2008). Presentation before the LSU Center for Energy Studies Industry Advisory Board Meeting. Baton Rouge, Louisiana. August 27, 2008.

124. "Greenhouse Gas Regulations and Policy: Implications for Louisiana." (2008). Presentation before the Praxair Customer Seminar. Houston, Texas, August 14, 2008.

125. "Market and Regulatory Issues in Alternative Energy and Louisiana Initiatives." (2008). Presentation before the 2008 Statewide Clean Cities Coalition Conference: Making Sense of Alternative Fuels and Advanced Technologies. New Orleans, Louisiana, March 27, 2008.

126. "Regulatory Issues in Rate Design, Incentives, and Energy Efficiency." (2007) Presentation before the New Hampshire Public Utilities Commission. Workshop on Energy Efficiency and Revenue Decoupling. November 7, 2007.

127. "Regulatory Issues for Consumer Advocates in Rate Design, Incentives, and Energy Efficiency." (2007). National Association of State Utility Consumer Advocates, Mid-Year Meeting. June 12, 2007.

128. "Regulatory and Policy Issues in Nuclear Power Plant Development." (2007). LSU Center for Energy Studies Industry Advisory Council Meeting. Baton Rouge, LA. March 23, 2007.

129. "Oil and Gas in the Gulf of Mexico: A North American Perspective." (2007). Canadian Consulate, Heads of Mission EnerNet Workshop, Houston, Texas. March 20, 2007.

130. "Regulatory Issues for Consumer Advocates in Rate Design, Incentives & Energy Efficiency. (2007). National Association of State Utility Consumer Advocates ("NASUCA") Gas Committee Monthly Meeting. February 13, 2006.

131. "Recent Trends in Natural Gas Markets." (2006). National Association of Regulatory

Utility Commissioners, 118th Annual Convention. Miami, FL November 14, 2006.

132. "Energy Markets: Recent Trends, Issues & Outlook." (2006). Association of Energy Service Companies (AESC) Meeting. Petroleum Club, Lafayette, LA, November 8, 2006.

133. "Energy Outlook" (2006). National Business Economics Issues Council. Quarterly Meeting, Nashville, TN, November 1-2, 2006.

134. "Global and U.S. Energy Outlook." (2006). Energy Virginia Conference. Virginia Military Institute, Lexington, VA October 17, 2006.

135. "Interdependence of Critical Energy Infrastructure Systems." (2006). Cross Border Forum on Energy Issues: Security and Assurance of North American Energy Systems. Woodrow Wilson Center for International Scholars. Washington, DC, October 13, 2006.

136. "Determining the Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2006) The Economic and Market Impacts of Coastal Restoration: America's Wetland Economic Forum II. Washington, DC September 28, 2006.

137. "Relationships between Power and Other Critical Energy Infrastructure." (2006). Rebuilding the New Orleans Region: Infrastructure Systems and Technology Innovation Forum. United Engineering Foundation. New Orleans, LA, September 24-25, 2006.

138. "Outlook, Issues, and Trends in Energy Supplies and Prices." (2006.) Presentation to the Southern States Energy Board, Associate Members Meeting. New Orleans, Louisiana. July 14, 2006.

139. "Energy Sector Outlook." (2006). Baton Rouge Country Club Meeting. Baton Rouge, Louisiana. July 11, 2006.

140. "Oil and Gas Industry Post 2005 Storm Events." (2006). American Petroleum Institute, Teche Chapter. Production, Operations, and Regulations Annual Meeting. Lafayette, Louisiana. June 29, 2006.

141. "Concentration of Energy Infrastructure in Hurricane Regions." (2006). Presentation before the National Commission on Energy Policy Forum: Ending the Stalemate on LNG Facility Siting. Washington, DC. June 21, 2006.

142. "LNG—A Premier." (2006). Presentation Given to the U.S. Department of Energy's "LNG Forums." Los Angeles, California. June 1, 2006.

143. "Regional Energy Infrastructure, Production and Outlook." (2006). Executive Briefing for Board of Directors, Louisiana Oil and Gas Plc., Enhanced Exploration, Inc. and Energy Self-Service, Inc. Covington, Louisiana, May 12, 2006.

144. "The Impacts of the Recent Hurricane Season on Energy Production and Infrastructure and Future Outlook." Presentation before the Industrial Energy Technology Conference 2006. New Orleans, Louisiana, May 9, 2006.

145. "Update on Regional Energy Infrastructure and Production." (2006). Executive Briefing for Delegation Participating in U.S. Department of Commerce Gulf Coast Business Investment Mission. Baton Rouge, Louisiana May 5, 2006.

146. "Hurricane Impacts on Energy Production and Infrastructure." (2006). Presentation before the Interstate Natural Gas Association of America Mid-Year Meeting. Hyatt

Regency Hill Country. April 21, 2006.

147. “LNG—A Premier.” Presentation Given to the U.S. Department of Energy’s “LNG Forums.” Astoria, Washington. April 28, 2006.

148. Natural Gas Market Outlook. Invited Presentation Given to the Georgia Public Service Commission and Staff. Georgia Institute of Technology, Atlanta, Georgia. March 10, 2006.

149. The Impacts of Hurricanes Katrina and Rita on Louisiana’s Energy Industry. Presentation to the Louisiana Economic Development Council. Baton Rouge, Louisiana. March 8, 2006.

150. Energy Markets: Hurricane Impacts and Outlook. Presentation to the 2006 Louisiana Independent Oil and Gas Association Annual Conference. L’Auberge du Lac Resort and Casino. Lake Charles, Louisiana. March 6, 2006

151. Energy Market Outlook and Update on Hurricane Damage to Energy Infrastructure. Presentation to the Energy Council 2005 Global Energy and Environmental Issues Conference. Santa Fe, New Mexico, December 10, 2005.

152. “Putting Our Energy Infrastructure Back Together Again.” Presentation Before the 117th Annual Convention of the National Association of Regulatory Utility Commissioners (NARUC). November 15, 2005. Palm Springs, CA

153. “Hurricanes and the Outlook for Energy Markets.” Presentation before the Baton Rouge Rotary Club. November 9, 2005, Baton Rouge, LA.

154. “Hurricanes, Energy Supplies and Prices.” Presentation before the Louisiana Department of Natural Resources and Atchafalaya Basin Committee Meeting. November 8, 2005. Baton Rouge, LA.

155. “The Impact of the Recent Hurricane’s on Louisiana’s Energy Industry.” Presentation before the Louisiana Independent Oil and Gas Association Board of Directors Meeting. November 8, 2005. Baton Rouge, LA.

156. “The Impact of the Recent Hurricanes on Louisiana’s Infrastructure and National Energy Markets.” Presentation before the Baton Rouge City Club Distinguished Speaker Series. October 13, 2005. Baton Rouge, LA.

157. “The Impact of the Recent Hurricanes on Louisiana’s Infrastructure and National Energy Markets.” Presentation before Powering Up: A Discussion About the Future of Louisiana’s Energy Industry. Special Lecture Series Sponsored by the Kean Miller Law Firm. October 13, 2005. Baton Rouge, LA.

158. “The Impact of Hurricane Katrina on Louisiana’s Energy Infrastructure and National Energy Markets.” Special Lecture on Hurricane Impacts, LSU Center for Energy Studies, September 29, 2005.

159. “Louisiana Power Industry Overview.” Presentation before the Clean Air Interstate Rule Implementation Stakeholders Meeting. August 11, 2005. Louisiana Department of Environmental Quality.

160. “CES 2005 Legislative Support and Outlook for Energy Markets and Policy.” Presentation before the LMOGA/LCA Annual Post-Session Legislative Committee Meeting. August 10-13, 2005. Perdido Key, Florida.

161. “Electric Restructuring: Past, Present, and Future.” Presentation to the Southeastern Association of Tax Administrators Annual Conference. Sheraton Hotel and Conference Facility. New Orleans, LA July 12, 2005.

162. “The Outlook for Energy.” Lagniappe Studies Continuing Education Course. Baton Rouge, LA. July 11, 2005.

163. “The Outlook for Energy.” Sunshine Rotary Club. Baton Rouge, LA. April 27, 2005.

164. “Background and Overview of LNG Development.” Energy Council Workshop on LNG/CNG. Biloxi, Ms: Beau Rivage Resort and Hotel, April 9, 2005.

165. “Natural Gas Supply, Prices, and LNG: Implications for Louisiana Industry.” Cytec Corporation Community Advisory Panel. Fortier, LA January 14, 2005.

166. “The Economic Opportunities for a Limited Industrial Retail Choice Plan.” Louisiana Department of Economic Development. Baton Rouge, Louisiana. November 19, 2004.

167. “Energy Issues for Industrial Customers of Gas and Power.” Louisiana Association of Business and Industry, Energy Council Meeting. Baton Rouge, Louisiana. October 11, 2004.

168. “Energy Issues for Industrial Customers of Gas and Power.” Annual Meeting of the Louisiana Chemical Association and the Louisiana Chemical Industry Alliance. Point Clear, Alabama. October 8, 2004.

169. “Energy Issues for Industrial Customers of Gas and Power.” American Institute of Chemical Engineers – New Orleans Section. New Orleans, LA. September 22, 2004.

170. “Natural Gas Supply, Prices and LNG: Implications for Louisiana Industry.” Dow Chemical Company Community Advisory Panel Meeting. Plaquemine, LA. August 9, 2004.

171. “Energy Issues for Industrial Customers of Gas and Power.” Louisiana Chemical Association Post-Legislative Meeting. Springfield, LA. August 9, 2004.

172. “LNG In Louisiana.” Joint Meeting of the Louisiana Economic Development Council and the Governors Cabinet Advisory Council. Baton Rouge, LA. August 5, 2004.

173. “Louisiana Energy Issues.” Louisiana Mid-Continent Oil and Gas Association Post Legislative Meetings. Sandestin, Florida. July 28, 2004.

174. “The Gulf South: Economic Opportunities Related to LNG.” Presentation before the Energy Council’s 2004 State and Provincial Energy and Environmental Trends Conference. Point Clear, AL, June 26, 2004.

175. “Natural Gas and LNG Issues for Louisiana.” Presentation before the Rhodia Community Advisory Panel. May 20, 2004, Baton Rouge, LA.

176. “The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Louisiana Chemical Association Plant Managers Meeting. May 27, 2004. Baton Rouge, LA.

177. The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Louisiana Chemical Association/Louisiana Chemical Industry Alliance Legislative Conference. May 26, 2004. Baton Rouge, LA.

178. “The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Petrochemical Industry Cluster, Greater New Orleans, Inc. May 19, 2004, Destrehan, LA.

179. “Industry Development Issues for Louisiana: LNG, Retail Choice, and Energy.” Presentation before the LSU Center for Energy Studies Industry Associates. May 14, 2004, Baton Rouge, LA.

180. “The Economic Opportunities for LNG Development in Louisiana.” Presentation before the Board of Directors, Greater New Orleans, Inc. May 13, 2004, New Orleans, LA.

181. “Natural Gas Outlook: Trends and Issues for Louisiana.” Presentation before the Louisiana Joint Agricultural Association Meetings. January 14, 2004, Hotel Acadiana, Lafayette, Louisiana.

182. “Natural Gas Outlook” Presentation before the St. James Parish Community Advisory Panel Meeting. January 7, 2004, IMC Production Facility, Convent, Louisiana.

183. “Competitive Bidding in the Electric Power Industry.” Presentation before the Association of Energy Engineers. Business Energy Solutions Expo. December 11-12, 2003, New Orleans, Louisiana.

184. “Regional Transmission Organization in the South: The Demise of SeTrans” Presentation before the LSU Center for Energy Studies Industry Associates Advisory Council Meeting. December 9, 2003. Baton Rouge, Louisiana.

185. “Affordable Energy: The Key Component to a Strong Economy.” Presentation before the National Association of Regulatory Utility Commissioners (“NARUC”), November 18, 2003, Atlanta, Georgia.

186. “Natural Gas Outlook.” Presentation before the Louisiana Chemical Association, October 17, 2003, Pointe Clear, Alabama.

187. “Issues and Opportunities with Distributed Energy Resources.” Presentation before the Louisiana Biomass Council. April 17, 2003, Baton Rouge, Louisiana.

188. “What’s Happened to the Merchant Energy Industry? Issues, Challenges, and Outlook” Presentation before the LSU Center for Energy Studies Industry Associates Advisory Council Meeting. November 12, 2002. Baton Rouge, Louisiana.

189. “An Introduction to Distributed Energy Resources.” Presentation before the U.S. Department of Energy, Office of Renewable Energy and Energy Efficiency, State Energy Program/Rebuild America Conference, August 1, 2002, New Orleans, Louisiana.

190. “Merchant Energy Development Issues in Louisiana.” Presentation before the Program Committee of the Center for Legislative, Energy, and Environmental Research (CLEER), Energy Council. April 19, 2002.

191. “Power Plant Siting Issues in Louisiana.” Presentation before 24th Annual Conference on Waste and the Environment. Sponsored by the Louisiana Department of Environmental Quality. Lafayette, Louisiana, Cajundome. March 12, 2002.

192. “Merchant Power and Deregulation: Issues and Impacts.” Presentation before the Air and Waste Management Association Annual Meeting. Baton Rouge, LA, November 15, 2001.

193. "Moving to the Front of the Lines: The Economic Impact of Independent Power Production in Louisiana." Presentation before the LSU Center for Energy Studies Merchant Power Generation and Transmission Conference, Baton Rouge, LA. October 11, 2001.

194. "Economic Impacts of Merchant Power Plant Development in Mississippi." Presentation before the U.S. Oil and Gas Association Annual Oil and Gas Forum. Jackson, Mississippi. October 10, 2001.

195. "Economic Opportunities for Merchant Power Development in the South." Presentation before the Southern Governor's Association/Southern State Energy Board Meetings. Lexington, KY. September 9, 2001.

196. "The Changing Nature of the Electric Power Business in Louisiana." Presentation before the Louisiana Department of Environmental Quality. Baton Rouge, LA, August 27, 2001.

197. "Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Interagency Group on Merchant Power Development . Baton Rouge, LA, July 16, 2001.

198. "The Changing Nature of the Electric Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Office of the Governor. Baton Rouge, LA, July 16, 2001.

199. "The Changing Nature of the Electric Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Department of Economic Development. Baton Rouge, LA, July 3, 2001.

200. "The Economic Impacts of Merchant Power Plant Development In Mississippi." Presentation before the Mississippi Public Service Commission. Jackson, Mississippi, March 20, 2001.

201. "Energy Conservation and Electric Restructuring." With Ritchie D. Priddy. Presentation before the Louisiana Department of Natural Resources. Baton Rouge, Louisiana, October 23, 2000.

202. "Pricing and Regulatory Issues Associated with Distributed Energy." Joint Conference by Econ One Research, Inc., the Louisiana State University Distributed Energy Resources Initiative, and the University of Houston Energy Institute: "Is the Window Closing for Distributed Energy?" Houston, Texas, October 13, 2000.

203. "Electric Reliability and Merchant Power Development Issues." Technical Meetings of the Louisiana Public Service Commission. Baton Rouge, LA. August 29, 2000.

204. "A Introduction to Distributed Energy Resources." Summer Meetings, Southeastern Association of Regulatory Utility Commissioners (SEARUC). New Orleans, LA. June 27, 2000.

205. Roundtable Moderator/Discussant. Mid-South Electric Reliability Summit. U.S. Department of Energy. New Orleans, Louisiana. April 24, 2000.

206. "Electricity 101: Definitions, Precedents, and Issues." Energy Council's 2000 Federal Energy and Environmental Matters Conference. Loews L'Enfant Plaza Hotel, Washington, D.C. March 11-13, 2000.

207. “LSU/CES Distributed Energy Resources Initiatives.” Los Alamos National Laboratories. Office of Energy and Sustainable Systems. Los Alamos, New Mexico. February 16, 2000.

208. “Distributed Energy Resources Initiatives.” Louisiana State University, Center for Energy Studies Industry Associates Meeting. Baton Rouge, Louisiana. December 15, 1999.

209. “Merchant Power Opportunities in Louisiana.” Louisiana Mid-Continent Oil and Gas Association (LMOGA) Power Generation Committee Meetings. Baton Rouge, Louisiana. November 10, 1999.

210. Roundtable Discussant. “Environmental Regulation in a Restructured Market” The Big E: How to Successfully Manage the Environment in the Era of Competitive Energy. PUR Conference. New Orleans, Louisiana. May 24, 1999.

211. “The Political Economy of Electric Restructuring In the South” Southeastern Electric Exchange, Rate Section Annual Conference. New Orleans, Louisiana. May 7, 1999.

212. “The Dynamics of Electric Restructuring in Louisiana.” Joint Meeting of the American Association of Energy Engineers and the International Association of Facilities Managers. Metairie, Louisiana. April 29, 1999.

213. “The Implications of Electric Restructuring on Independent Oil and Gas Operations.” Petroleum Technology Transfer Council Workshop: Electrical Power Cost Reduction Methods in Oil and Gas Field Operations. Lafayette, Louisiana, March 24, 1999.

214. “What’s Happened to Electricity Restructuring in Louisiana?” Louisiana State University, Center for Energy Studies Industry Associates Meeting. March 22, 1999.

215. “A Short Course on Electric Restructuring.” Central Louisiana Electric Company. Sales and Marketing Division. Mandeville, Louisiana, October 22, 1998.

216. “The Implications of Electric Restructuring on Independent Oil and Gas Operations.” Petroleum Technology Transfer Council Workshop: Electrical Power Cost Reduction Methods in Oil and Gas Field Operations. Shreveport, Louisiana, October 13, 1998.

217. “How Will Utility Deregulation Affect Tourism.” Louisiana Travel Promotion Association Annual Meeting, Alexandria, Louisiana. January 15, 1998.

218. “Reflections and Predictions on Electric Utility Restructuring in Louisiana.” With Fred I. Denny. Louisiana State University, Center for Energy Studies Industry Associates Meeting. November 20, 1997.

219. “Electric Utility Restructuring in Louisiana.” Hammond Chamber of Commerce, Hammond, Louisiana. October 30, 1997.

220. “Electric Utility Restructuring.” Louisiana Association of Energy Engineers. Baton Rouge, Louisiana. September 11, 1997.

221. “Electric Utility Restructuring: Issues and Trends for Louisiana.” Opelousas Chamber of Commerce, Opelousas, Louisiana. June 24, 1997.

222. “The Electric Utility Restructuring Debate In Louisiana: An Overview of the Issues.” Annual Conference of the Public Affairs Research Council of Louisiana. Baton Rouge, Louisiana. March 25, 1997.

223. “Electric Restructuring: Louisiana Issues and Outlook for 1997.” Louisiana State University, Center for Energy Studies Industry Associates Meeting, Baton Rouge, Louisiana, January 15, 1997.

224. “Restructuring the Electric Utility Industry.” Louisiana Propane Gas Association Annual Meeting, Alexandria, Louisiana, December 12, 1996.

225. “Deregulating the Electric Utility Industry.” Eighth Annual Economic Development Summit, Baton Rouge, Louisiana, November 21, 1996.

226. “Electric Utility Restructuring in Louisiana.” Jennings Rotary Club, Jennings, Louisiana, November 19, 1996.

227. “Electric Utility Restructuring in Louisiana.” Entergy Services, Transmission and Distribution Division, Energy Centre, New Orleans, Louisiana, September 12, 1996

228. “Electric Utility Restructuring” L ouisiana Electric Cooperative Association, Baton Rouge, Louisiana, August 27, 1996.

229. “Electric Utility Restructuring -- Background and Overview.” Louisiana Public Service Commission, Baton Rouge, Louisiana, August 14, 1996.

230. “Electric Utility Restructuring.” Sunshine Rotary Club Meetings, Baton Rouge, Louisiana, August 8, 1996.

231. Roundtable Moderator, “Stakeholder Perspectives on Electric Utility Stranded Costs.” Louisiana State University, Center for Energy Studies Seminar on Electric Utility Restructuring in Louisiana, Baton Rouge, May 29, 1996.

232. Panelist, “Deregulation and Competition.” American Nuclear Society: Second Annual Joint Louisiana and Mississippi Section Meetings, Baton Rouge, Louisiana, April 20, 1996.

EXPERT WITNESS, LEGISLATIVE, AND PUBLIC TESTIMONY; EXPERT REPORTS, RECOMMENDATIONS, AND AFFIDAVITS

1. Expert Testimony. Formal Case No. 11142. (2017) Before the Public Service Commission of the District of Columbia. *In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.* On Behalf of the Office of the People’s Counsel. Issues: merger/acquisition policy, financial risk, ring-fencing, and reliability.

2. Expert Testimony. D.P.U. 17-05. (2017). Before the Massachusetts Department of Public Utilities. *Petition of NSTAR Electric Company and Western Massachusetts Electric Company each d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates for Electric Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00*. On Behalf of the Massachusetts Office of the Attorney General Office of Ratepayer Advocacy. Issues: performance-based ratemaking.

3. Deposition and Testimony. (2017) Before the Nebraska Section 70, Article 13 Arbitration Panel. *Northeast Nebraska Public Power District, City of South Sioux City Nebraska; City of Wayne, Nebraska; City of Valentine, Nebraska; City of Beatrice, Nebraska; City of Scribner, Nebraska; Village of Walthill, Nebraska, vs. Nebraska Public Power District.* On the Behalf of Baird Holm LLP for the Plaintiffs. Issues: rate discounts; cost of service; utility regulation, economic harm.

4. Expert Testimony. Docket No. 16-052-U. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Application of the Oklahoma Gas and Electric Company for Approval of a General Change in Rates, Charges and Tariffs.* On the Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: cost of service, rate design, alternative regulation, formula rate plan.

5. Expert Testimony. Docket No. 16-KCPE-593-ACQ. (2016). Before the Kansas Corporation Commission. In the Matter of the Joint Application *of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Acquisition of Westar, Inc. by Great Plains Energy Incorporated.* On the Behalf of the Kansas Electric Power Cooperative, Inc. Issues: merger/acquisition policy, financial risk, and ring-fencing.

6. Expert Testimony. Formal Case No. 1139. (2016). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service.* On the Behalf of the Office of the People's Counsel for the District of Columbia. Issues: cost of service, rate design, alternative regulation.

7. Expert Affidavit. Docket No. CP15-558-000 (2016). Before the United States of America Federal Energy Regulatory Commission. *PennEast Pipeline Company, LLC*. Affidavit and Reply Affidavit. On the Behalf of the New Jersey Division of Rate Counsel. Issues: pipeline capacity, peak day requirements.

8. Expert Testimony. Docket No. RPU-2016-0002. (2016). Before the Iowa Utilities Board. *In re: Iowa American Water Company application for revision of rates.* On behalf of the Citizens of the State of Florida. Issue: revenue stabilization mechanism, revenue decoupling.

9. Expert Testimony. Docket No. 15-015-U. Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U*. On behalf of the Office of the Arkansas Attorney General Leslie Rutledge. Issue: formula rate plan evaluation.

10. Expert Testimony. Docket Nos. 160021-EI, 160061-EI, 160062-EI, and 160088-EI. (2016). Before the Florida Public Service Commission. *In re: Petition for rate increase by Florida Power & Light Company (consolidated).* On behalf of the Office of Consumer Advocate, Iowa Department of Justice. Issue: load forecasting.

11. Expert Testimony. Docket Nos. 160021-EI, 160061-EI, 160062-EI, and 160088-EI. (2016). Before the Florida Public Service Commission. *In re: Petition for rate increase by Florida Power & Light Company (consolidated).* On behalf of the Citizens of the State of Florida. Issue: off-system sales incentives.

12. Expert Testimony. Project No. 5-103. (2016). United States of America Federal Energy Regulatory Commission. *Confederated Salish and Kootenai Tribes Energy Keepers, Incorporated*. On behalf of the Flathead, Mission, and Jocko Valley Irrigation Districts and the Flathead Joint Board of Control of the Flathead, Mission, and Jocko Valley Irrigation Districts.

13. Expert Testimony. Docket No. 15-098-U. (2016). Before the Arkansas Public Service Commission. *In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas for a General Change or Modification in its*

Rates, Charges and Tariffs. On behalf of the Office of the Arkansas Attorney General. Issues: formula rate plan, cost of service and rate design.

14. Expert Testimony. BPU Docket No. GM15101196. (2016). *In the Matter of the Merger of Southern Company and AGL Resources, Inc*. On behalf of the New Jersey Division of Rate Counsel. Issues: merger standards of review, customer dividend contributions, synergy savings and costs to achieve, ratemaking treatment of merger-related costs.

15. Expert Testimony. Docket No. 15-078-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Joint Application of SourceGas Inc., SourceGas LLC, SourceGas Holdings LLC and Black Hills Utility Holdings, Inc. for all Necessary Authorizations and Approvals for Black Hills Utility Holdings, Inc. to Acquire SourceGas Holdings LLC.* On behalf of the Office of the Arkansas Attorney General. Issues: public policy and regulatory policy associated with the acquisition.

16. Expert Testimony. Docket No. 15-031-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Application of SourceGas Arkansas Inc. for an Order Approving the Acquisition of Certain Storage Facilities and the Recovery of Investments and Expenses Associated Therewith.* On behalf of the Office of the Arkansas Attorney General. Issues: cost-benefit analysis, transmission cost analysis, and a due diligence analysis.

17. Expert Testimony. Docket No. 15-015-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Application of Entergy Arkansas, Inc. for Approval of Changes in Rates for Retail Electric Service.* On behalf of the Office of the Arkansas Attorney General. Issues: economic development riders and production plant cost allocation.

18. Expert Testimony. Docket No. 7970. (2015). Before the Vermont Public Service Board. *Petition of Vermont Gas Systems, Inc., for a certificate of public good pursuant to 30 V.S.A.§ 248, authorizing the construction of the "Addison Natural Gas Project" consisting of approximately 43 miles of new natural gas transmission pipeline in Chittenden and Addison Counties, approximately 5 miles of new distribution mainlines in Addison County, together with three new gate stations in Williston, New Haven, and Middlebury, Vermont*. On behalf of AARP-Vermont. Issues: net economic benefits of proposed natural gas transmission project.

19. Expert Testimony. File No. ER-2014-0370 (2015). Before the Public Service Commission of the State of Missouri. *In the Matter of Kansas City Power & Light Company for Authority Implement A General Rate Increase for Electric Service*. On behalf of the Missouri Office of the People's Counsel. Issues: customer charges, rate design, revenue distribution, class cost of service, and policy and ratemaking considerations in connection with electric vehicle charging stations.

20. Expert Testimony. File No. ER-2014-0351 (2015). Before the Public Service Commission of the State of Missouri. *In the Matter of The Empire District Electric Company for Authority To File Tariffs Increasing Rates for Electric Service Provided to Customers In the Company's Missouri Service Area*. On behalf of the Missouri Office of the People's Counsel. Issues: customer charges, rate design, revenue distribution, and class cost of service.

21. Expert Testimony. D.P.U. 14-130 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil for*

approval by the Department of Public Utilities of the Company's 2015 Gas System Enhancement Program Plan, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

22. Expert Testimony. D.P.U. 14-131 (2015). Before the Massachusetts Department of Public Utilities. *Petition of The Berkshire Gas Company for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

23. Expert Testimony. D.P.U. 14-132 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Boston Gas Company and Colonial Gas Company d/b/a National Grid for approval by the Department of Public Utilities of the Companies' Gas System Enhancement Program for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

24. Expert Testimony. D.P.U. 14-133 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Liberty Utilities for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

25. Expert Testimony. D.P.U. 14-134 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates to be effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

26. Expert Testimony. D.P.U. 14-135 (2015). Before the Massachusetts Department of Public Utilities. *Petition of NSTAR Gas Company for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates to be effective May 1, 2015*. On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.

27. Expert Report. Docket No. X-33192 (2015). Before the Louisiana Public Service Commission. *Examination of the Comprehensive Costs and Benefits of Net Metering in Louisiana.* On behalf of the Louisiana Public Service Commission. Issues: cost-benefit, cost of service, rate impact.

28. Expert Testimony. F.C. 1119 (2014). Before the District of Columbia Public Service Commission. *In the Matter of the Merger of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC, and new Special Purpose Entity, LLC*. On behalf of the Office of the People's Counsel. Issues: economic impact analysis, reliability, consumer investment fund, regulatory oversight, impacts to competitive electricity markets.

29. Expert Report. Civil Action 1:08-cv-0046 (2014). Before the U.S. District Court for the

Southern District of Ohio. *Anthony Williams, et al., v. Duke Energy International, Inc., et al.* On behalf of Markovits, Stock & DeMarco, Attorneys & Counselors at Law. Issues: public utility regulation, electric power markets, economic harm.

30. Expert Testimony. D.P.U. 14-64 (2014). Before the Massachusetts Department of Public Utilities. *NSTAR Gas Company/HOPCO Gas Services Agreement. On behalf of the Office of the Public Advocate*. Issues: certain ratemaking features associated with the proposed Gas Service Agreement.

31. Expert Testimony. Docket Nos. 14-0224 and 14-0225 (2014). Before the Illinois Commerce Commission. *In the Matter of the Peoples Gas Light and Coke Company and North Shore Gas Company Proposed General Increase in Rates for Gas Service (consolidated)*. On behalf of the People of the State of Illinois. Issues: test year expenses, cost benchmarking analysis, pipeline replacement, and leak rate comparisons.

32. Expert Testimony. Docket 8191 (2014). Before the Vermont Public Service Board. *In Re: Petition of Green Mountain Power Corporation for Approval of a Successor Alternative Regulation Plan.* On the behalf of AARP-Vermont. Issues: Alternative Regulation.

33. Expert Testimony. Docket No. 2013-00168 (2014). Before the Maine Public Utilities Commission. *In the Matter of the Request for Approval of an Alternative Rate Plan (ARP 2014) Pertaining to Central Maine Power Company*. On behalf of the Office of the Public Advocate. Issues: class cost of service study, marginal cost of service study, revenue distribution and rate design.

34. Expert Testimony. D.P.U. 13-90 (2013). Before the Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil to the Department of Public Utilities for approval of the rates and charges and increase in base distribution rates for electric service.* On behalf of the Office of the Ratepayer Advocate. Issues: capital cost adjustment mechanism and performance-based regulation.

35. Expert Testimony. BPU Docket Nos. EO13020155 and GO13020156. (2013). Before the State of New Jersey Board of Public Utilities. *I/M/O The Petition of Public Service Electric & Gas Company for the Approval of the Energy Strong Program.* On behalf of the Division of Rate Counsel. Issues: economic impact, infrastructure replacement program rider, pipeline replacement, leak rate comparisons and cost benefit analysis.

36. Expert Testimony. D.P.U. 13-75 (2013). Before the Massachusetts Department of Public Utilities. *Investigation by the Department of Public Utilities on its Own Motion as to the Propriety of the Rates and Charges by Bay State Gas Company d/b/a Columbia Gas of Massachusetts set forth in Tariffs M.D.P.U. Nos. 140 through 173, and Approval of an Increase in Base Distribution Rates for Gas Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00 et seq., filed with the Department on April 16, 2013, to be effective May 1, 2013*. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Target infrastructure replacement program rider, pipeline replacement, and leak rate comparisons; environmental benefits analysis; O&M offset; and cost benchmarking analysis.

37. Expert Testimony. Docket No. 13-115 (2013). Before the Delaware Public Service Commission. *In the Matter of the Application of Delmarva Power & Light Company FOR*

an Increase in Electric Base Rates and Miscellaneous Tariff Changes (Filed March 22, 2013). On the Behalf of Division of the Public Advocate. Issues: pro forma infrastructure proposal, class cost of service study, revenue distribution, and rate design.

38. Expert Testimony. Formal Case No. 1103 (2013). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of the Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service*. On the Behalf of the Office of the People's Counsel of the District of Columbia. Issues: Pro forma adjustment for reliability investments.

39. Expert Testimony. Case No. 9326 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Baltimore Gas and Electric Company for Adjustments to its Electric and Gas Base Rates*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Electric Reliability Investment ("ERI") initiatives, pro forma gas infrastructure proposal, tracker mechanisms, class cost of service study, revenue distribution, and rate design

40. Rulemaking Testimony. (2013). Before the Louisiana Tax Commission. Examination of Louisiana Assessors' Association Well Diameter Analysis, economic development policies regarding midstream assets and industrial development.

41. Expert Testimony. Case No. 9317 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Delmarva Power & Light Company for Adjustments to its Retail Rates for the Distribution of Electric Energy*. Direct, and Surrebuttal. On the Behalf of the Maryland Office of the People's Counsel. Issues: Grid Resiliency Charge, tracker mechanisms, pipeline replacement, class cost of service study, revenue distribution, and rate design.

42. Expert Testimony. Case No. 9311 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Potomac Electric Power Company for an Increase in its Retail Rates for the Distribution of Electric Energy*. Direct, and Surrebuttal. On the Behalf of the Maryland Office of the People's Counsel. Issues: Grid Resiliency Charge, tracker mechanisms, pipeline replacement, class cost of service study, revenue distribution, and rate design.

43. Expert Testimony. Docket No. 12AL-1268G (2013). Before the Public Utilities Commission of the State of Colorado. *In the Matter of the Tariff Sheets Filed by Public Service Company of Colorado with Advice No. 830 – Gas. Answer*. On the Behalf of the Colorado Office of Consumer Counsel. Issues: Pipeline System Integrity Adjustment, tracker mechanisms, pipeline replacement and leak rate comparisons.

44. Expert Testimony. BPU Docket No. EO12080721 (2013). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric & Gas Company for Approval of an Extension of Solar Generation Program*. On the Behalf of the New Jersey Division of Rate Counsel. Direct, Rebuttal, Surrebuttal. Issues: solar energy market design, solar energy market conditions, solar energy program design and net economic benefits.

45. Expert Testimony. BPU Docket No. EO12080726 (2013). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Public Service Electric & Gas Company for Approval of a Solar Loan III Program.* On the Behalf of the New Jersey Division of Rate Counsel. Direct, Rebuttal and Surrebuttal. Issues: solar energy market design, solar energy market conditions, solar energy program design.

46. Expert Testimony. BPU Docket No. EO11050314V. (2012). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Fishermen's Atlantic City Windfarm, LLC for the Approval of the State Waters Project and Authorizing Offshore Wind Renewable Energy Certificates*. On the Behalf of the New Jersey Division of Rate Counsel. December 17, 2012. Issues: approval of offshore wind project and ratepayer financial support for the proposed project.

47. Expert Testimony. D.P.U. 12-25. (2012). Before the Massachusetts Department of Public Utilities. *In the Matter of Bay State Gas Company d/b/a/ Columbia Gas Company of Massachusetts Request for Increase in Rates*. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Target infrastructure replacement program rider, pipeline replacement and leak rate comparisons.

48. Expert Testimony. Docket Nos. UE-120436, et.al. (consolidated). (2012). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission v. Avista Corporation D/B/A Avista Utilities*. On the Behalf of the Washington Attorney General, Office of the Public Counsel. Issues: Revenue Decoupling, lost revenues, tracker mechanisms, attrition adjustments.

49. Expert Testimony. Case No. 9286. (2012) Before the Public Service Commission of Maryland. *In Re: Potomac Electric Power Company ("Pepco") General Rate Case*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Capital tracker mechanisms/reliability investment mechanisms, reliability issues, regulatory lag, class cost of service, revenue distribution, rate design.

50. Expert Testimony. Case No 9285. (2012) Before the Public Service Commission of Maryland. *In Re: the Delmarva Power and Light Company General Rate Case*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Capital tracker mechanisms/reliability investment mechanisms, reliability issues, regulatory lag, class cost of service, revenue distribution, rate design.

51. Expert Testimony. Docket Nos. UE-110876 and UG-110877 (consolidated). (2012). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission v. Avista Corporation D/B/A Avista Utilities*. On the Behalf of the Washington Attorney General, Office of the Public Counsel. Issues: Revenue Decoupling, lost revenues, tracker mechanisms.

52. Expert Testimony. BPU Docket No. EO11050314V. (2012). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Fishermen's Atlantic City Windfarm, LLC for the Approval of the State Waters Project and Authorizing Offshore Wind Renewable Energy Certificates*. On the Behalf of the New Jersey Division of Rate Counsel. February 3, 2012. Issues: approval of offshore wind project and ratepayer financial support for the proposed project.

53. Expert Testimony. Docket No. NG 0067. (2012). Before the Public Service Commission of Nebraska. *In the Matter of the Application of SourceGas Distribution, LLC Approval of a General Rate Increase*. On the Behalf of the Public Advocate. January 31, 2012. Issues: Revenue Decoupling, Customer Adjustments, Weather Normalization Adjustments, Class Cost of Service Study, Rate Design.

54. Expert Testimony. Docket No. G-04204A-11-0158. (2011). Before the Arizona Corporation Commission. On the Behalf of the Arizona Corporation Commission Staff. *In the Matter of the Application of UNS Gas, Inc. for the Establishment of Just and*

Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of Its Arizona Properties. Issues: Revenue Decoupling; Class Cost of Service Modeling; Revenue Distribution; Rate Design.

55. Expert Testimony. Formal Case Number 1087. (2011). Before the Public Service Commission of the District of Columbia. On the Behalf of the Office of the People's Counsel of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service*. Issues: Regulatory lag, ratemaking principles, reliability-related capital expenditure tracker proposals.

56. Expert Affidavit. Case No. 11-1364. (2011). *The State of Louisiana, the Louisiana Department of Environmental Quality, and the Louisiana Public Service Commission v. United States Environmental Protection Agency and Lisa P. Jackson.* Before the United States Court of Appeals for the District of Columbia Circuit. On the behalf of the State of Louisiana, the Louisiana Department of Environmental Quality, and the Louisiana Public Service Commission. Issues: Impacts of environmental costs on electric utilities, compliance requirements, investment cost of mitigation equipment, multi-area dispatch modeling and plant retirements.

57. Expert Affidavit. Docket No. EPA-HQ-OAR-2009-0491. (2011). Before the U.S. Environmental Protection Agency. *Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals*. On the Behalf of the Louisiana Public Service Commission. Issues: Impacts of environmental costs on electric utilities, compliance requirements, investment cost of mitigation equipment, multi-area dispatch modeling and plant retirements.

58. Expert Testimony. Case No. 9296. (2011). Before the Maryland Public Service Commission. *On the Behalf of the Maryland Office of People's Counsel. In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges and Revise its Terms and Conditions for Gas Service*. Issues: Infrastructure Cost Recovery Rider; Class Cost of Service Modeling; Revenue Distribution; Rate Design.

59. Expert Testimony. Docket No. G-01551A-10-0458. (2011). Before the Arizona Corporation Commission. On the Behalf of the Arizona Corporation Commission Staff. *In the Matter of the Application of Southwest Gas Corporation for the Establishment of Just and Reasonable Rates and Charges Designed to Realize A Reasonable Rate of Return on the Fair Value of its Properties throughout Arizona*. Issues: Revenue Decoupling; Class Cost of Service Modeling; Revenue Distribution; Rate Design.

60. Expert Testimony. Docket No. 11-0280 and 11-0281. (2011). Before the Illinois Commerce Commission. On the Behalf of the Illinois Attorney General, the Citizens Utility Board, and the City of Chicago, Illinois. *In re: Peoples Gas Light and Coke Company and North Shore Natural Gas Company*. Issues: Revenue Decoupling and Rate Design. (Direct and Rebuttal)

61. Expert Testimony. D.P.U. 11-01. (2011). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. *Petition of the Fitchburg Electric and Gas Company (Electric Division) for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism*. Issues: Capital Cost Rider, Revenue Decoupling.

62. Expert Testimony. D.P.U. 11-02. (2011). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. *Petition of the Fitchburg Electric and Gas Company (Gas Division) for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism*. Issues: Pipeline Replacement Rider, Revenue Decoupling.

63. Expert Affidavit. Docket No. EL-11-13 (2011). Before the Federal Energy Regulatory Commission. Petition for Preliminary Ruling, Atlantic Grid Operations. On the Behalf of the New Jersey Division of Rate Counsel. Issues: Offshore wind generation development, offshore wind transmission development, ratemaking treatment of development costs, transmission development incentives.

64. Expert Opinion. Case No. CI06-195. (2011). Before the District Court of Jefferson County, Nebraska. On the Behalf of the City of Fairbury, Nebraska and Michael Beachler. In re: Endicott Clay Products Co. vs. City of Fairbury, Nebraska and Michael Beachler. Issues: rate design and ratemaking, time of use and time differentiated rate structures, empirical analysis of demand and usage trends for tariff eligibility requirements.

65. Expert Testimony. D.P.U. 10-114. (2010). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Petition of the New England Gas Company for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism. Issues: infrastructure replacement rider.

66. Expert Testimony. D.P.U. 10-70. (2010). Before the Massachusetts Department of Public Utilities. Petition of the Western Massachusetts Electric Company for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; infrastructure replacement rider; performance-based regulation; inflation adjustment mechanisms; and rate design.

67. Expert Testimony. G.U.D. Nos. 998 & 9992. (2010). Before the Texas Railroad Commission. In the Matter of the Rate Case Petition of Texas Gas Services, Inc. On the Behalf of the City of El Paso, Texas. Issues: Cost of service, revenue distribution, rate design, and weather normalization.

68. Expert Testimony. B.P.U Docket No. GR10030225. (2010). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of New Jersey Natural Gas Company for Approval of Regional Greenhouse Gas Initiative Programs and Associated Cost Recovery Mechanisms Pursuant to N.J.S.A. 48:3-98.1. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy proposals, solar securitization issues, solar energy policy issues.

69. Expert Testimony. D.P.U. 10-55. (2010). Before the Massachusetts Department of Public Utilities. Investigation Into the Propriety of Proposed Tariff Changes for Boston Gas Company, Essex Gas Company, and Colonial Gas Company. (d./b./a. National Grid). On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; pipeline-replacement rider; performance-based regulation; partial productivity factor estimates, inflation adjustment mechanisms; and rate design.

70. Expert Testimony. Cause No.43839. (2010). Before the Indiana Utility Regulatory

Commission. In the Matter of Southern Indiana Gas and Electric Company d/b/a/ Vectren Energy Delivery of Indiana, Inc. (Vectren South-Electric). On the behalf of the Indiana Office of Utility Consumer Counselor (OUCC). Issues: revenue decoupling, variable production cost riders, gains on off-system sales, transmission cost riders.

71. Congressional Testimony. Before the United States Congress. (2010). U.S. House of Representatives, Committee on Natural Resources. Hearing on the Consolidated Land, Energy, and Aquatic Resources Act. June 30, 2010.

72. Expert Testimony. Before the City Counsel of El Paso, Texas; Public Utility Regulatory Board. (2010). On the Behalf of the City of El Paso. In Re: Rate Application of Texas Gas Services, Inc. Issues: class cost of service study (minimum system and zero intercept analysis), rate design proposals, weather normalization adjustment, and its cost of service adjustment clause, conservation adjustment clause proposals, and other cost tracker policy issues.

73. Expert Testimony. Docket 09-00183. (2010). Before the Tennessee Regulatory Authority. In the Matter of the Petition of Chattanooga Gas Company for a General Rate Increase, Implementation of the EnergySMART Conservation Programs, and Implementation of a Revenue Decoupling Mechanism. On the Behalf of Tennessee Attorney General, Consumer Advocate & Protection Division. Issues: revenue decoupling and energy efficiency program review and cost effectiveness analysis.

74. Expert Testimony and Exhibits. Docket No. 10-240. (2010). Before the Louisiana Office of Conservation. In Re: Cadeville Gas Storage, LLC. On the Behalf of Cardinal Gas Storage, LLC. Issues: alternative uses and relative economic benefits of conversion of depleted hydrocarbon reservoir for natural gas storage purposes.

75. Expert Testimony. Docket No. 09505-EI. (2010). Before the Florida Public Service Commission. In Re: Review of Replacement Fuel Costs Associated with the February 26, 2008 outage on Florida Power & Light's Electrical System. On the Behalf of the Florida Office of Public Counsel for the Citizens of the State of Florida. Issues: Replacement costs for power outage, regulatory policy/generation development incentives, renewable and energy efficiency incentives.

76. Expert Testimony. Docket 09-00104. (2009). Before the Tennessee Regulatory Authority. In the Matter of the Petition of Piedmont Natural Gas Company, Inc. to Implement a Margin Decoupling Tracker Rider and Related Energy Efficiency and Conservation Programs. On the Behalf of the Tennessee Attorney General, Consumer Advocate & Protection Division. Issues: revenue decoupling, energy efficiency program review, weather normalization.

77. Expert Testimony. Docket Number NG-0060. (2009). Before the Nebraska Public Service Commission. In the Matter of SourceGas Distribution, LLC Approval for a General Rate Increase. On the Behalf of the Nebraska Public Advocate. October 29, 2009. Issues: revenue decoupling, inflation trackers, infrastructure replacement riders, customer adjustment rider, weather normalization rider, weather normalization adjustments, estimation of normal weather for ratemaking purposes.

78. Expert Report and Deposition. Before the 23rd Judicial District Court, Parish of Assumption, State of Louisiana. On the Behalf of Dow Hydrocarbons and Resources, Inc. September 1, 2009. (Deposition, November 23-24, 2009). Issues: replacement and repair costs for underground salt cavern hydrocarbon storage.

79. Expert Testimony. D.P.U. 09-39. Before the Massachusetts Department of Public Utilities. (2009). Investigation Into the Propriety of Proposed Tariff Changes for Massachusetts Electric Company and Nantucket Electric Company (d./b./a. National Grid). On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; infrastructure rider; performance-based regulation; inflation adjustment mechanisms; revenue distribution; and rate design.

80. Expert Testimony. D.P.U. 09-30. Before the Massachusetts Department of Public Utilities. (2009). In the Matter of Bay State Gas Company Request for Increase in Rates. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; target infrastructure replacement program rider; revenue distribution; and rate design.

81. Expert Testimony. Docket EO09030249. (2009). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric and Gas Company for Approval of a Solar Loan II Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy market design, renewable portfolio standards, solar energy, and renewable financing/loan program design.

82. Expert Testimony. Docket EO0920097. (2009). Before the New Jersey Board of Public Utilities. In the Matter of the Verified Petition of Rockland Electric Company for Approval of an SREC-Based Financing Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy market design; renewable energy portfolio standards; solar energy.

83. Expert Rebuttal Report. Civil Action No.: 2:07-CV-2165. (2009). Before the U.S. District Court, Western Division of Louisiana, Lake Charles Division. Prepared on the Behalf of the Transcontinental Pipeline Corporation. Issues: expropriation and industrial use of property.

84. Expert Testimony. Docket EO06100744. (2008). Before the New Jersey Board of Public Utilities. In the Matter of the Renewable Portfolio Standard – Amendments to the Minimum filing Requirements for Energy Efficiency, Renewable Energy, and Conservation Programs and For Electric Distribution Company Submittals of Filings in connection with Solar Financing (Atlantic City Electric Company). On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: Solar energy market design; renewable energy portfolio standards; solar energy. (Rebuttal and Surrebuttal)

85. Expert Testimony. Docket EO08090840. (2008). Before the New Jersey Board of Public Utilities. In the Matter of the Renewable Portfolio Standard – Amendments to the Minimum filing Requirements for Energy Efficiency, Renewable Energy, and Conservation Programs and For Electric Distribution Company Submittals of Filings in connection with Solar Financing (Jersey Central Power & Light Company). On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: Solar energy market design; renewable energy portfolio standards; solar energy. (Rebuttal and Surrebuttal)

86. Expert Testimony. Docket UG-080546. (2008). Before the Washington Utilities and Transportation Commission. On the Behalf of the Washington Attorney General (Public Counsel Section). Issues: Rate Design, Cost of Service, Revenue Decoupling, Weather

Normalization.

87. Congressional Testimony. (2008). Senate Republican Conference: Panel on Offshore Drilling in the Restricted Areas of the Outer Continental Shelf. September 18, 2008.

88. Expert Testimony. Appeal Number 2007-125 and 2007-299. (2008). Before the Louisiana Tax Commission. On the Behalf of Jefferson Island Storage and Hub, LLC (AGL Resources). Issues: Valuation Methodologies, Underground Storage Valuation, LTC Guidelines and Policies, Public Purpose of Natural Gas Storage. July 15, 2008 and August 20, 2008.

89. Expert Testimony. Docket Number 07-057-13. (2008). Before the Utah Public Service Commission. In the Matter of the Application of Questar Gas Company to File a General Rate Case. On the Behalf of the Utah Committee of Consumer Services. Issues: Cost of Service, Rate Design. August 18, 2008 (Direct, Rebuttal, Surrebuttal).

90. Rulemaking Testimony. (2008). Before the Louisiana Tax Commission. Examination of Replacement Cost Tables, Depreciation and Useful Lives for Oil and Gas Properties. Chapter 9 (Oil and Gas Properties) Section. August 5, 2008.

91. Legislative Testimony. (2008). Examination of Proposal to Change Offshore Natural Gas Severance Taxes (HB 326 and Amendments). Joint Finance and Appropriations Committee of the Alabama Legislature. March 13, 2008.

92. Public Testimony. (2007). Issues in Environmental Regulation. Testimony before Gubernatorial Transition Committee on Environmental Regulation (Governor-Elect Bobby Jindal). December 17, 2007.

93. Public Testimony. (2007). Trends and Issues in Alternative Energy: Opportunities for Louisiana. Testimony before Gubernatorial Transition Committee on Natural Resources (Governor-Elect Bobby Jindal). December 13, 2007.

94. Expert Report and Recommendation: Docket Number S-30336 (2007). Before the Louisiana Public Service Commission. In re: Entergy Gulf States, Inc. Application for Approval of Advanced Metering Pilot Program. Issues: pilot program for demand response programs and advanced metering systems.

95. Expert Testimony. Docket EO07040278 (2007). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric & Gas Company for Approval of a Solar Energy Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: renewable energy market development, solar energy development, SREC markets, rate impact analysis, cost recovery issues.

96. Expert Testimony: Docket Number 05-057-T01 (2007). Before the Utah Public Service Commission. In the Matter of: Joint Application of Questar Gas Company, the Division of Public Utilities, and Utah Clean Energy for Approval of the Conservation Enabling Tariff Adjustment Options and Accounting Orders. On the behalf of the Utah Committee of Consumer Services. Issues: Revenue Decoupling, Demand-side Management; Energy Efficiency policies. (Direct, Rebuttal, and Surrebuttal Testimony)

97. Expert Testimony (Non-sworn rulemaking testimony) Docket Number RR-2008, (2007). Before the Louisiana Tax Commission. In re: Commission Consideration of Amendment and/or Adoption of Tax Commission Real/Personal Property Rules and Regulations.

Issues: Louisiana oil and natural gas production trends, appropriate cost measures for wells and subsurface property, economic lives and production decline curve trends.

98. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29213 & 29213-A, ex parte, (2007). Before the Louisiana Public Service Commission. In re: In re: Investigation to determine if it is appropriate for LPSC jurisdictional electric utilities to provide and install time-based meters and communication devices for each of their customers which enable such customers to participate in time-based pricing rate schedules and other demand response programs. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: demand response programs, advanced meter systems, cost recovery issues, energy efficiency issues, regulatory issues.

99. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29712, ex parte, (2007) Before the Louisiana Public Service Commission. In re: Investigation into the ratemaking and generation planning implications of nuclear construction in Louisiana. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: nuclear cost power plant development, generation planning issues, and cost recovery issues.

100. Expert Testimony, Case Number U-14893, (2006). Before the Michigan Public Service Commission. In the Matter of SEMCO Energy Gas Company for Authority to Redesign and Increase Its Rates for the Sale and Transportation of Natural Gas In its MPSC Division and for Other Relief. On the behalf of the Michigan Attorney General. Issues: Rate Design, revenue decoupling, financial analysis, demand-side management program and energy efficiency policy. (Direct and Rebuttal Testimony).

101. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29380, ex parte, (2006). Before the Louisiana Public Service Commission. In re: An Investigation Into the Ratemaking and Generation Planning Implications of the U.S. EPA Clean Air Interstate Rule. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: environmental regulation and cost recovery; allowance allocations and air credit markets; ratepayer impacts of new environmental regulations.

102. Expert Affidavit Before the Louisiana Tax Commission (2006). On behalf of ANR Pipeline, Tennessee Gas Transmission and Southern Natural Gas Company. Issues: Competitive nature of interstate and intrastate transportation services.

103. Expert Affidavit Before the 19th Judicial District Court (2006). Suit Number 491, 453 Section 26. On behalf of Transcontinental Pipeline Corporation, et.al. Issues: Competitive nature of interstate and intrastate transportation services.

104. Expert Testimony: Docket Number 05-057-T01 (2006). Before the Utah Public Service Commission. In the Matter of: Joint Application of Questar Gas Company, the Division of Public Utilities, and Utah Clean Energy for Approval of the Conservation Enabling Tariff Adjustment Options and Accounting Orders. On the behalf of the Utah Committee of Consumer Services. Issues: Revenue Decoupling, Demand-side Management; Energy Efficiency policies. (Rebuttal and Supplemental Rebuttal Testimony)

105. Legislative Testimony (2006). Senate Committee on Natural Resources. Senate Bill 655 Regarding Remediation of Oil and Gas Sites, Legacy Lawsuits, and the Deterioration of State Drilling.

106. Expert Report: Rulemaking Docket (2005). Before the New Jersey Bureau of Public Utilities. In re: Proposed Rulemaking Changes Associated with New Jersey's Renewable Portfolio Standard. Expert Report. The Economic Impacts of New Jersey's Proposed Renewable Portfolio Standard. On behalf of the New Jersey Office of Ratepayer Advocate. Issues: Renewable Portfolio Standards, rate impacts, economic impacts, technology cost forecasts.

107. Expert Testimony: Docket Number 2005-191-E. (2005). Before the South Carolina Public Service Commission. On behalf of NewSouth Energy LLC. In re: General Investigation Examining the Development of RFP Rules for Electric Utilities. Issues: Competitive bidding; merchant development. (Direct and Rebuttal Testimony).

108. Expert Testimony: Docket No. 05-UA-323. (2005). Before the Mississippi Public Service Commission. On the behalf of Calpine Corporation. In re: Entergy Mississippi's Proposed Acquisition of the Attala Generation Facility. Issues: Asset acquisition; merchant power development; competitive bidding.

109. Expert Testimony: Docket Number 050045-EI and 050188-EI. (2005). Before the Florida Public Service Commission. On the behalf of the Citizens of the State of Florida. In re: Petition for Rate Increase by Florida Power & Light Company. Issues: Load forecasting; O&M forecasting and benchmarking; incentive returns/regulation.

110. Expert Testimony (non-sworn, rulemaking): Comments on Decreased Drilling Activities in Louisiana and the Role of Incentives. (2005). Louisiana Mineral Board Monthly Docket and Lease Sale. July 13, 2005

111. Legislative Testimony (2005). Background and Impact of LNG Facilities on Louisiana. Joint Meeting of Senate and House Natural Resources Committee. Louisiana Legislature. May 19, 2005.

112. Public Testimony. Docket No. U-21453. (2005). Technical Conference before the Louisiana Public Service Commission on an Investigation for a Limited Industrial Retail Choice Plan.

113. Expert Testimony: Docket No. 2003-K-1876. (2005). On Behalf of Columbia Gas Transmission. Expert Testimony on the Competitive Market Structure for Gas Transportation Service in Ohio. Before the Ohio Board of Tax Appeals.

114. Expert Report and Testimony: Docket No. 99-4490-J, *Lafayette City-Parish Consolidated Government, et. al. v. Entergy Gulf States Utilities, Inc. et. al*. (2005, 2006). On behalf of the City of Lafayette, Louisiana and the Lafayette Utilities Services. Expert Rebuttal Report of the Harborfront Consulting Group Valuation Analysis of the LUS Expropriation. Filed before 15th Judicial District Court, Lafayette, Louisiana.

115. Expert Testimony: ANR Pipeline Company v. Louisiana Tax Commission (2005), Number 468,417 Section 22, 19th Judicial District Court, Parish of East Baton Rouge, State of Louisiana Consolidated with Docket Numbers: 480,159; 489,776;480,160; 480,161; 480,162; 480,163; 480,373; 489,776; 489,777; 489,778;489,779; 489,780; 489,803; 491,530; 491,744; 491,745; 491,746; 491,912;503,466; 503,468; 503,469; 503,470; 515,414; 515,415; and 515,416. In re: Market structure issues and competitive implications of tax differentials and valuation methods in natural gas transportation markets for interstate and intrastate pipelines.

116. Expert Report and Recommendation: Docket No. U-27159. (2004). On Behalf of the

Louisiana Public Service Commission Staff. Expert Report on Overcharges Assessed by Network Operator Services, Inc. Before the Louisiana Public Service Commission.

117. Expert Testimony: Docket Number 2004-178-E. (2004). Before the South Carolina Public Service Commission. On behalf of Columbia Energy LLC. In re: Rate Increase Request of South Carolina Electric and Gas. (Direct and Surrebuttal Testimony)

118. Expert Testimony: Docket Number 040001-EI. (2004). Before the Florida Public Service Commission. On behalf of Power Manufacturing Systems LLC, Thomas K. Churbuck, and the Florida Industrial Power Users Group. In re: Fuel Adjustment Proceedings; Request for Approval of New Purchase Power Agreements. Company examined: Florida Power & Light Company.

119. Expert Affidavit: Docket Number 27363. (2004). Before the Public Utilities Commission of Texas. Joint Affidavit on Behalf of the Cities of Texas and the Staff of the Public Utilities Commission of Texas Regarding Certified Issues. In Re: Application of Valor Telecommunications, L.P. For Authority to Establish Extended Local Calling Service (ELCS) Surcharges For Recovery of ELCS Surcharge.

120. Expert Report and Testimony. Docket 1997-4665-PV, 1998-4206-PV, 1999-7380-PV, 2000-5958-PV, 2001-6039-PV, 2002-64680-PV, 2003-6231-PV. (2003) Before the Kansas Board of Tax Appeals. (2003). In the Matter of the Appeals of CIG Field Services Company from orders of the Division of Property Valuation. On the Behalf of CIG Field Services. Issues: the competitive nature of natural gas gathering in Kansas.

121. Expert Report and Testimony: Docket Number U-22407. Before the Louisiana Public Service Commission (2002). On the Behalf of the Louisiana Public Service Commission Staff. Company examined: Louisiana Gas Services, Inc. Issues: Purchased Gas Acquisition audit, fuel procurement and planning practices.

122. Expert Testimony: Docket Number 000824-EI. Before the Florida Public Service Commission. (2002). On the Behalf of the Citizens of the State of Florida. Company examined: Florida Power Corporation. Issues: Load Forecasts and Billing Determinants for the Projected Test Year.

123. Public Testimony: Louisiana Board of Commerce and Industry (2001). Testimony on the Economic Impacts of Merchant Power Generation.

124. Expert Testimony: Docket Number 24468. (2001). On the Behalf of the Texas Office of Public Utility Counsel. Public Utility Commission of Texas Staff's Petition to Determine Readiness for Retail Competition in the Portion of Texas Within the Southwest Power Pool. Company examined: AEP-SWEPCO.

125. Expert Report. (2001) On Behalf of David Liou and Pacific Richland Products, Inc. to Review Cogeneration Issues Associated with Dupont Dow Elastomers, L.L.C. (DDE) and the Dow Chemical Company (Dow).

126. Expert Testimony: Docket Number 01-1049, Docket Number 01-3001. (2001) On behalf the Nevada Office of Attorney General, Bureau of Consumer Protection. Petition of Central Telephone Company-Nevada D/b/a Sprint of Nevada and Sprint Communications L.P. for Review and Approval of Proposed Revised Performance Measures and Review and Approval of Performance Measurement Incentive Plans. Before the Public Utilities Commission of Nevada.

127. Expert Affidavit: Multiple Dockets (2001). Before the Louisiana Tax Commission. On the Behalf of Louisiana Interstate Pipeline Companies. Testimony on the Competitive Nature of Natural Gas Transportation Services in Louisiana.

128. Expert Affidavit before the Federal District Court, Middle District of Louisiana (2001). Issues: Competitive Nature of the Natural Gas Transportation Market in Louisiana. On behalf of a Consortium of Interstate Natural Gas Transportation Companies.

129. Public Testimony: Louisiana Board of Commerce and Industry (2001). Testimony on the Economic and Ratepayer Benefits of Merchant Power Generation and Issues Associated with Tax Incentives on Merchant Power Generation and Transmission.

130. Expert Testimony: Docket Number 01-1048 (2001). Before the Public Utilities Commission of Nevada. On the Behalf of the Nevada Office of the Attorney General, Bureau of Consumer Protection. Company analyzed: Nevada Bell Telephone Company. Issues: Statistical Issues Associated with Performance Incentive Plans.

131. Expert Testimony: Docket 22351 (2001). Before the Public Utility Commission of Texas. On the Behalf of the City of Amarillo. Company analyzed: Southwestern Public Service Company. Issues: Unbundled cost of service, affiliate transactions, load forecasting.

132. Expert Testimony: Docket 991779-EI (2000). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Competitive Nature of Wholesale Markets, Regional Power Markets, and Regulatory Treatment of Incentive Returns on Gains from Economic Energy Sales.

133. Expert Testimony: Docket 990001-EI (1999). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Regulatory Treatment of Incentive Returns on Gains from Economic Energy Sales.

134. Expert Testimony: Docket 950495-WS (1996). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Company analyzed: Southern States Utilities, Inc. Issues: Revenue Repression Adjustment, Residential and Commercial Demand for Water Service.

135. Legislative Testimony. Louisiana House of Representatives, Special Subcommittee on Utility Deregulation. (1997). On Behalf of the Louisiana Public Service Commission Staff. Issue: Electric Restructuring.

136. Expert Testimony: Docket 940448-EG -- 940551-EG (1994). Before the Florida Public Service Commission. On the Behalf of the Legal Environmental Assistance Foundation. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Comparison of Forecasted Cost-Effective Conservation Potentials for Florida.

137. Expert Testimony: Docket 920260-TL, (1993). Before the Florida Public Service Commission. On the Behalf of the Florida Public Service Commission Staff. Company analyzed: BellSouth Communications, Inc. Issues: Telephone Demand Forecasts and Empirical Estimates of the Price Elasticity of Demand for Telecommunication Services.

138. Expert Testimony: Docket 920188-TL, (1992). Before the Florida Public Service Commission. On the Behalf of the Florida Public Service Commission Staff. Company analyzed: GTE-Florida. Issues: Telephone Demand Forecasts and Empirical Estimates of the Price Elasticity of Demand for Telecommunication Services.

REFEREE AND EDITORIAL APPOINTMENTS

Contributor, 2014-Current, *Wall Street Journal*, *Journal Reports*, Energy

Editorial Board Member, 2015-Current, *Utilities Policy*

Referee, 2014-Current, *Utilities Policy*

Referee, 2010-Current, *Economics of Energy & Environmental Policy*

Referee, 1995-Current*, Energy Journal*

Contributing Editor, 2000-2005, *Oil, Gas and Energy Quarterly*

Referee, 2005, *Energy Policy*

Referee, 2004, *Southern Economic Journal*

Referee, 2002, *Resource & Energy Economics*

Committee Member, IAEE/USAEE Student Paper Scholarship Award Committee, 2003

PROPOSAL TECHNICAL REVIEWER

California Energy Commission, Public Interest Energy Research (PIER) Program (1999).

PROFESSIONAL ASSOCIATIONS

American Economic Association, American Statistical Association, Southern Economic Association, Western Economic Association, International Association of Energy Economists (“IAEE”), United States Association of Energy Economics (“USAEE”), the National Association for Business Economics (“NABE”), and the Energy Bar Association.

HONORS AND AWARDS

National Association of Regulatory Utility Commissioners (NARUC). Best Paper Award for papers published in the *Journal of Applied Regulation* (2004).

Baton Rouge Business Report, Selected as “Top 40 Under 40” (2003).

Omicron Delta Epsilon (1992-Current).

Interstate Oil and Gas Compact Commission (IOGCC) "Best Practice" Award for Research on the Economic Impact of Oil and Gas Activities on State Leases for the Louisiana Department of Natural Resources (2003).

Distinguished Research Award, Academy of Legal, Ethical and Regulatory Issues, Allied Academics (2002).

Florida Public Service Commission, Staff Excellence Award for Assistance in the Analysis of Local Exchange Competition Legislation (1995).

TEACHING EXPERIENCE

Energy and the Environment (Survey Course)

Principles of Microeconomic Theory

Principles of Macroeconomic Theory

Lecturer, Environmental Management and Permitting. Lecture in Natural Gas Industry, LNG and Markets.

Lecturer, Electric Power Industry Environmental Issues, Field Course on Energy and the Environment. (Dept. of Environmental Studies).

Lecturer, Electric Power Industry Trends, Principles Course in Power Engineering (Dept. of Electric Engineering).

Lecturer, LSU Honors College, Senior Course on "Society and the Coast."

Continuing Education. Electric Power Industry Restructuring for Energy Professionals.

"The Gulf Coast Energy Situation: Outlook for Production and Consumption." Educational Course and Lecture Prepared for the Foundation for American Communications and the Society for Professional Journalists, New Orleans, LA, December 2, 2004

"The Impact of Hurricane Katrina on Louisiana's Energy Infrastructure and National Energy Markets." Educational Course and Lecture Prepared for the Foundation for American Communications and the Society for Professional Journalists, Houston, TX, September 13, 2005.

"Forecasting for Regulators: Current Issues and Trends in the Use of Forecasts, Statistical, and Empirical Analyses in Energy Regulation." Instructional Course for State Regulatory Commission Staff. Institute of Public Utilities, Kellogg Center, Michigan State University. July 8-9, 2010.

"Regulatory and Ratemaking Issues with Cost and Revenue Trackers." Michigan State University, Institute of Public Utilities. Advanced Regulatory Studies Program. September 29, 2010.

"Demand Modeling and Forecasting for Regulators." Michigan State University, Institute of Public Utilities. Advanced Regulatory Studies Program. September 30, 2010.

"Demand Modeling and Forecasting for Regulators." Michigan State University, Institute of Public Utilities, Forecasting Workshop, Charleston, SC. March 7-9, 2011.

"Regulatory and Cost Recovery Approaches for Smart Grid Applications." Michigan State University, Institute of Public Utilities, Smart Grid Workshop for Regulators. Charleston, SC. March 7-11, 2011.

"Regulatory and Ratemaking Issues Associated with Cost and Expense Adjustment Mechanisms." Michigan State University, Institute of Public Utilities, Advanced Regulatory Studies Program. Lansing, Michigan. September 28, 2011.

"Utility Incentives, Decoupling, and Renewable Energy Programs." Michigan State University, Institute of Public Utilities, Advanced Regulatory Studies Program. Lansing, Michigan. September 29, 2011.

"Regulatory and Cost Recovery Approaches for Smart Grid Applications." Michigan State University, Institute of Public Utilities, Smart Grid Workshop for Regulators. Charleston, SC. March 6-8, 2012.

"Traditional and Incentive Ratemaking Workshop." New Mexico Public Utilities Commission Staff. Santa Fe, NM October 18, 2012.

"Traditional and Incentive Ratemaking Workshop." New Jersey Board of Public Utilities Staff. Newark, NJ. March 1, 2013.

THESIS/DISSERTATIONS COMMITTEES

Active:
2 Thesis Committee Memberships (Environmental Studies)
1 Ph.D. Dissertation Committee (Economics)
Completed:
6 Thesis Committee Memberships (Environmental Studies, Geography)
4 Doctoral Committee Memberships (Information Systems & Decision Sciences, Agricultural and Resource Economics, Economics, Education and Workforce Development).
2 Doctoral Examination Committee Membership (Information Systems & Decision Sciences, Education and Workforce Development)
1 Senior Honors Thesis (Journalism, Loyola University)

LSU SERVICE AND COMMITTEE MEMBERSHIPS

Committee Member, Energy Education Curriculum Committee. E.J. Ourso College of Business. LSU (2016-Current).

Chairman, LSU Energy Initiative/LSU Energy Council (2014-Current).

Co-Director & Steering Committee Member, LSU Coastal Marine Institute (2009-2014).

CES Promotion Committee, Division of Radiation Safety (2006).

Search Committee Chair (2006), Research Associate 4 Position.

Search Committee Member (2005), Research Associate 4 Position.

Search Committee Member (2005), CES Communications Manager.

LSU Graduate Research Faculty, Associate Member (1997-2004); Full Member (2004-2010); Affiliate Member with Full Directional Rights (2011-2014); Full Member (2014-current).

LSU Faculty Senate (2003-2006).

Conference Coordinator. (2005-Current) Center for Energy Studies Conference on Alternative Energy.

LSU CES/SCE Public Art Selection Committee (2003-2005).

Conference Coordinator. Center for Energy Studies Annual Energy Conference/Summit. (2003-Current).

Conference Coordinator. Center for Energy Studies Seminar Series on Electric Utility Restructuring and Wholesale Competition. (1996-2003).

Co-Chairman, Review Committee, Louisiana Port Construction and Development Priority Program Rules and Regulations, On Behalf of the LSU Ports and Waterways Institute. (1997).

LSU Main Campus Cogeneration/Turbine Project, (1999-2000).

LSU InterCollege Environmental Cooperative. (1999-2001).

LSU Faculty Senate Committee on Public Relations (1997-1999).

LSU Faculty Senate Committee on Student Retention and Recruitment (1999-2003).

PROFESSIONAL SERVICE

Program Committee Member (2015). Gulf Coast Power Association Workshop/Special Breifing. "Gulf Coast Disaster Readiness: A Past, Present and Future Look at Power and Industry Readiness in MISO South."

Advisor (2008). National Association of Regulatory Utility Commissioners ("NARUC"). Study Committee on the Impact of Executive Drilling Moratoria on Federal Lands.

Steering Committee Member, Louisiana Representative (2008-Current). Southeast Agriculture & Forestry Energy Resources Alliance. Southern Policies Growth Board.

Advisor (2007-Current). National Association of State Utility Consumer Advocates ("NASUCA"), Natural Gas Committee.

Program Committee Chairman (2007-2008). U.S. Association of Energy Economics ("USAEE") Annual Conference, New Orleans, LA

Finance Committee Chairman (2007-2008). USAEE Annual Conference, New Orleans, LA

Committee Member (2006), International Association for Energy Economics ("IAEE") Nominating Committee.

Founding President (2005-2007) Louisiana Chapter, USAEE.

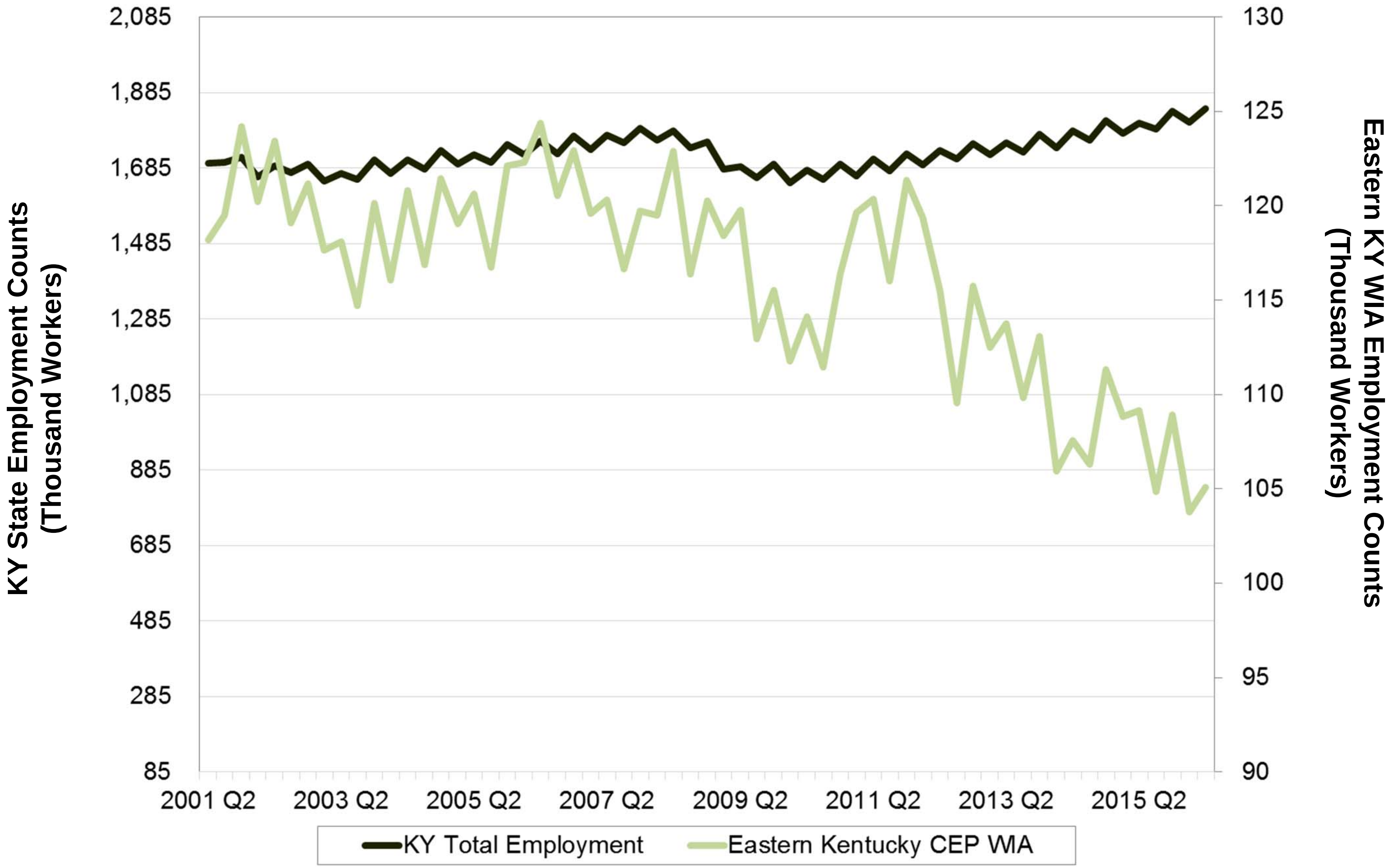
Secretary (2001) Houston Chapter, USAEE.

Advisor, Louisiana LNG Buyers/Developers Summit, Office of the Governor/Louisiana Department of Economic Development/Louisiana Department of Natural Resources, and Greater New Orleans, Inc. (2004).

Table of Exhibits

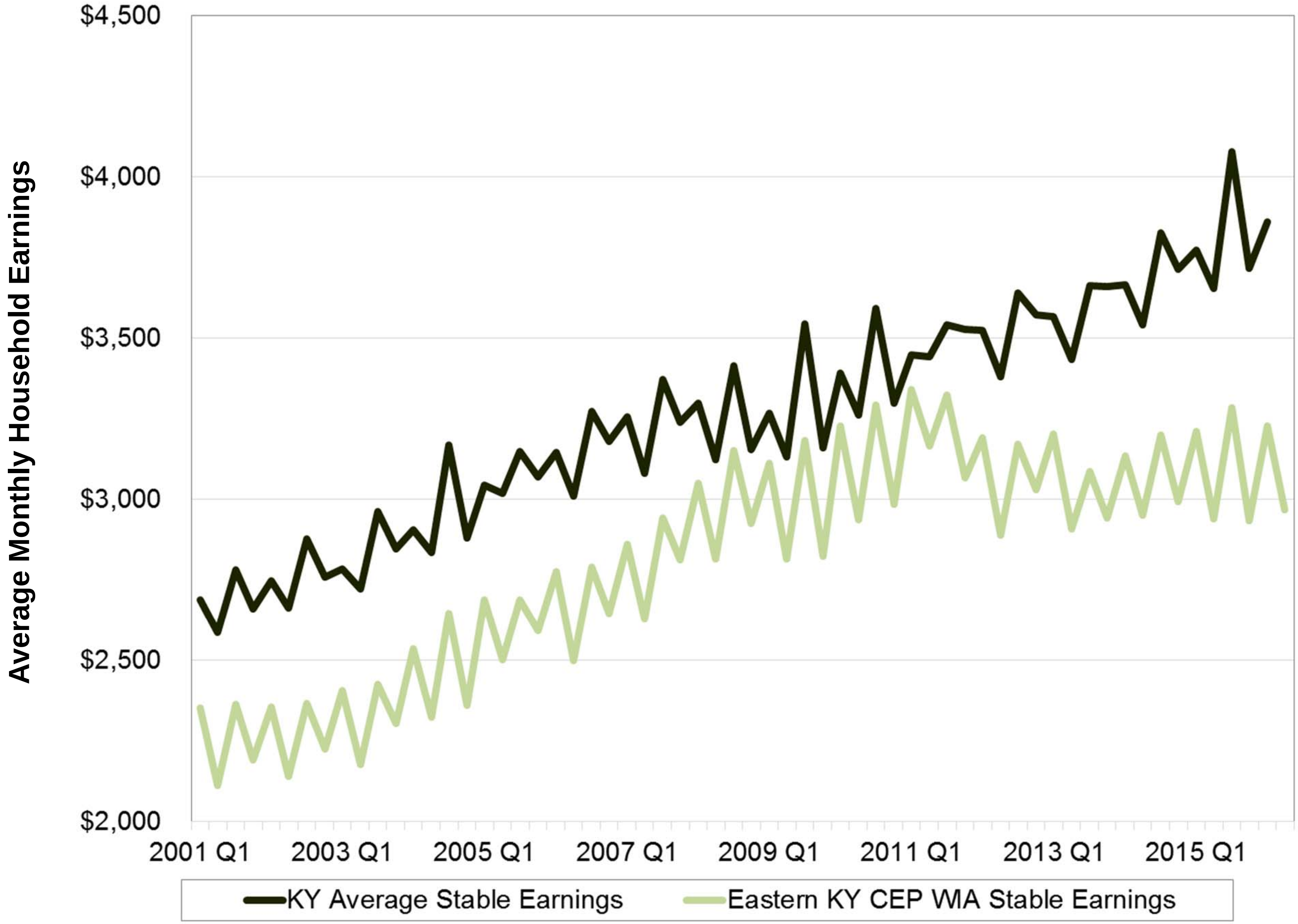
Title	Exhibit
Historic Quarterly Employment - Eastern Kentucky and Total State	Exhibit DED - 1
Historic Monthly Average Earnings - Eastern Kentucky and Total State	Exhibit DED - 2
Company's Historic Residential Rates	Exhibit DED - 3
Peer Analysis Rate per MWh	Exhibit DED - 4
Analysis of Company's Customer Costs	Exhibit DED - 5
Survey of Regional Customer Charges	Exhibit DED - 6
Usage by Income	Exhibit DED - 7
Consumption as Percent of Income	Exhibit DED - 8
Analysis of Company's Customer Counts, Sales, and Revenues (2006 -	Exhibit DED - 9

Historic Quarterly Employment - Eastern Kentucky and Total State



Source: U.S. Census Bureau, Center for Economic Studies, Quarterly Workforce Indicators (“QWI”)

Historic Monthly Average Earnings – Eastern Kentucky and Total State



Source: U.S. Census Bureau, Center for Economic Studies, Quarterly Workforce Indicators ("QWI")

Company's Historic Residential Rates

	Case No. 2005-00341 Mar-06	Case No. 2009-00459 Jun-10	Case No. 2014-00396 Jun-15	Case No. 2017-00179 Jul-17	Total Increase Case Nos. (2005-0034) - (2014-0039) Total	Average Annual	Total Increase Case Nos. (2005-0034) - (2017-00179) Total	Average Annual
Residental Service ("RS")								
Customer Charge per month	$5.86	$8.00	$11.00	$17.50	87.71%	9.48%	198.63%	17.53%
Energy Charge per kWh	$0.06002	$0.08590	$0.08910	$0.10853	48.45%	5.24%	80.82%	7.13%
Total Monthly Bill								
RS Customer at System Average Use (1,295 kWh per month)								
Fixed Charge								
Customer Charge per month	$5.86	$8.00	$11.00	$17.50				
Variable Charge								
Energy Charge per kWh	$0.06002	$0.08590	$0.08910	$0.10853				
Monthly Use	1295	1295	1295	1295				
Total Variable Charge	$77.73	$111.24	$115.38	$140.55				
Total Monthly Bill	**$83.59**	**$119.24**	**$126.38**	**$158.05**	**51.20%**	**5.54%**	**89.08%**	**7.86%**
RS Customer at 50% System Average Use (648 kWh per month)								
Fixed Charge								
Customer Charge per month	$5.86	$8.00	$11.00	$17.50				
Variable Charge								
Energy Charge per kWh	$0.06002	$0.08590	$0.08910	$0.10853				
Monthly Use	648	648	648	648				
Total Variable Charge	$38.89	$55.66	$57.74	$70.33				
Total Monthly Bill	**$44.75**	**$63.66**	**$68.74**	**$87.83**	**53.59%**	**5.79%**	**96.25%**	**8.49%**
RS Customer at 150% System Average Use (1,943 kWh per month)								
Fixed Charge								
Customer Charge per month	$5.86	$8.00	$11.00	$17.50				
Variable Charge								
Energy Charge per kWh	$0.06002	$0.08590	$0.08910	$0.10853				
Monthly Use	1943	1943	1943	1943				
Total Variable Charge	$116.62	$166.90	$173.12	$210.87				
Total Monthly Bill	**$122.48**	**$174.90**	**$184.12**	**$228.37**	**50.33%**	**5.44%**	**86.46%**	**7.63%**

Source: Prior Commission Case Orders; Application, Section II, Exhibit D; and FERC Form 1.

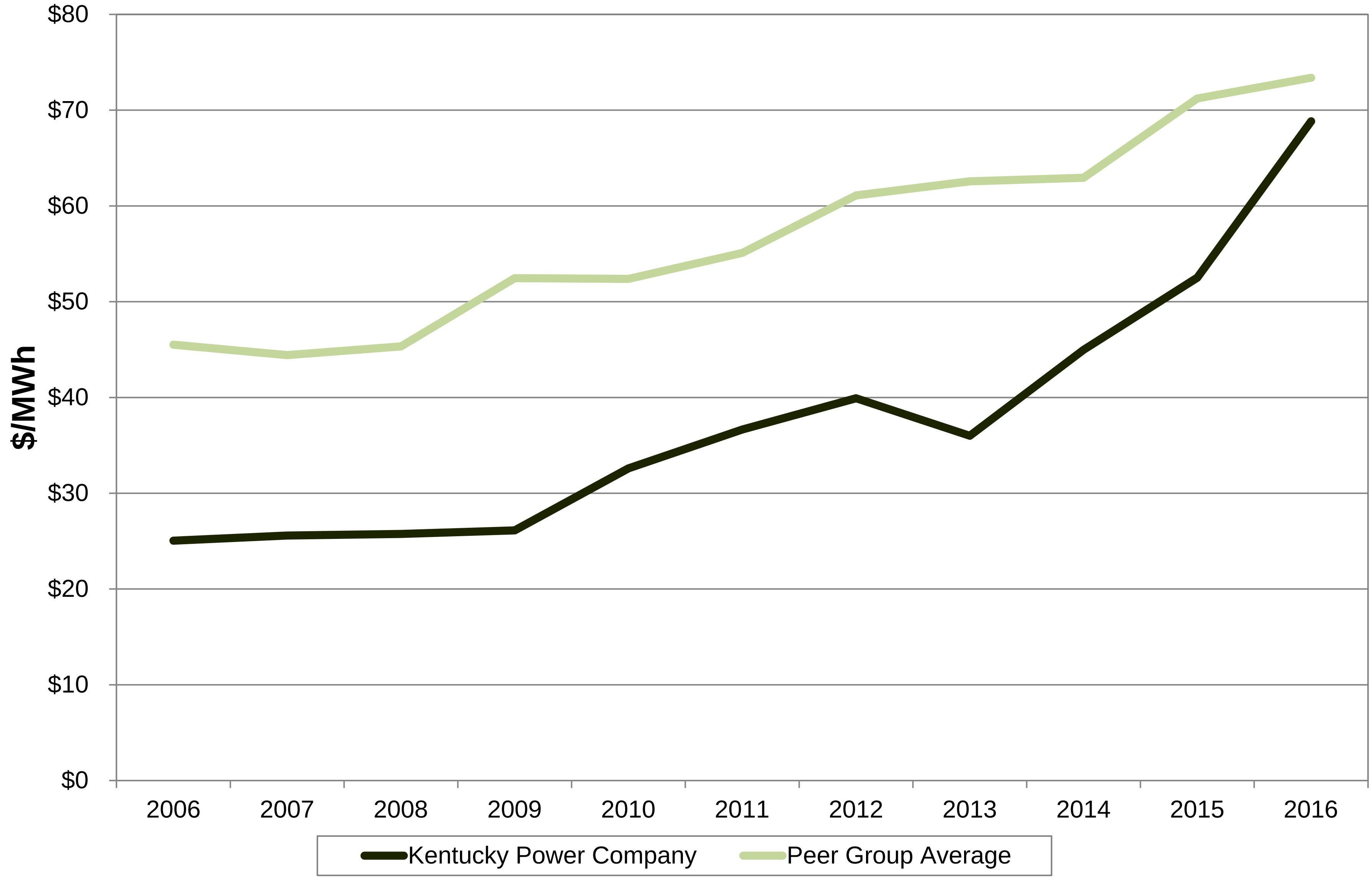
Peer Analysis Rate per MWh (Residential)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	($/MWh)										
Kentucky Power Company	**$ 25.05**	**$ 25.58**	**$ 25.75**	**$ 26.12**	**$ 32.59**	**$ 36.66**	**$ 39.92**	**$ 36.00**	**$ 44.97**	**$ 52.52**	**$ 68.84**
Alabama Power Company	50.81	55.92	58.41	65.77	70.92	74.24	78.79	76.17	76.91	84.86	90.65
Ameren Missouri	48.76	48.19	48.05	51.98	56.86	66.56	70.71	77.10	74.71	85.34	77.00
Appalachian Power Company	26.93	26.23	28.10	35.20	38.36	36.03	47.63	45.64	58.24	66.54	76.66
Duke Energy Carolinas, LLC	55.09	56.72	53.47	58.25	59.99	61.21	71.67	70.31	73.47	78.82	78.92
Duke Energy Kentucky, Inc.	38.00	43.35	43.66	50.95	46.69	47.66	51.07	49.88	46.31	50.05	54.72
Duke Energy Progress	55.81	57.91	56.60	63.73	61.31	61.71	61.56	63.08	59.27	67.43	69.91
Entergy Arkansas, Inc.	54.72	41.37	44.72	50.60	54.74	45.96	58.88	56.66	47.70	65.57	68.50
Entergy Mississippi, Inc.	42.80	30.00	29.73	39.00	31.54	36.79	36.18	40.93	47.93	56.55	40.76
Kentucky Utilities Company	29.61	31.61	32.20	38.41	41.75	46.91	49.07	55.38	56.64	62.67	68.06
Louisville Gas and Electric Company	37.91	39.02	38.65	43.42	46.04	50.05	52.36	58.94	60.55	67.41	70.06
South Carolina Electric & Gas Company	62.28	62.51	66.62	67.30	64.60	72.45	83.20	89.10	89.69	98.16	105.01
Virginia Electric and Power Company	43.42	40.20	43.75	64.86	55.85	61.59	72.02	67.68	63.89	71.29	80.34
Peer Group Average	**$ 45.51**	**$ 44.42**	**$ 45.33**	**$ 52.46**	**$ 52.39**	**$ 55.10**	**$ 61.09**	**$ 62.57**	**$ 62.94**	**$ 71.22**	**$ 73.38**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	(Rank)										
Kentucky Power Company	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**1**	**1**	**2**	**5**
Alabama Power Company	9	10	12	12	13	13	12	11	12	11	12
Ameren Missouri	8	9	9	8	9	11	9	12	11	12	9
Appalachian Power Company	2	2	2	2	3	1	3	3	6	6	8
Duke Energy Carolinas, LLC	11	11	10	9	10	8	10	10	10	10	10
Duke Energy Kentucky, Inc.	5	8	6	7	6	6	5	4	2	1	2
Duke Energy Progress	12	12	11	10	11	10	8	8	7	8	6
Entergy Arkansas, Inc.	10	7	8	6	7	4	7	6	3	5	4
Entergy Mississippi, Inc.	6	3	3	4	1	3	1	2	4	3	1
Kentucky Utilities Company	3	4	4	3	4	5	4	5	5	4	3
Louisville Gas and Electric Company	4	5	5	5	5	7	6	7	8	7	7
South Carolina Electric & Gas Company	13	13	13	13	12	12	13	13	13	13	13
Virginia Electric and Power Company	7	6	7	11	8	9	11	9	9	9	11

Source: FERC Form 1.

Peer Analysis Rate per MWh (Residential)



Source: FERC Form 1.

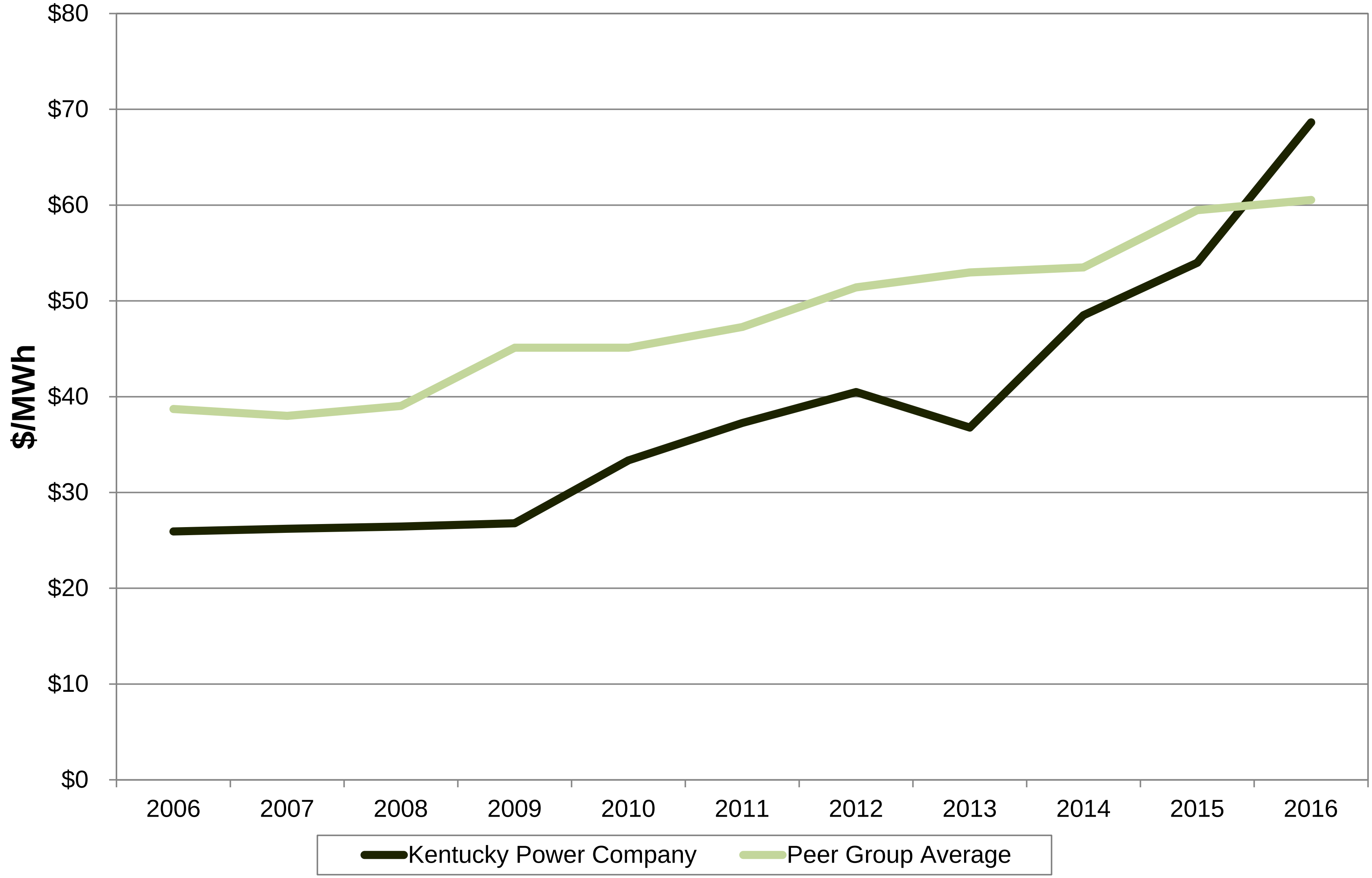
Peer Analysis Rate per MWh (Commercial)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	($/MWh)										
Kentucky Power Company	**$ 25.93**	**$ 26.21**	**$ 26.45**	**$ 26.79**	**$ 33.35**	**$ 37.26**	**$ 40.48**	**$ 36.76**	**$ 48.50**	**$ 53.99**	**$ 68.64**
Alabama Power Company	46.46	51.23	53.90	61.06	65.84	68.11	71.65	69.84	70.79	77.11	82.71
Ameren Missouri	39.60	39.83	40.21	43.11	46.67	53.35	54.44	60.84	59.10	64.97	59.68
Appalachian Power Company	23.90	22.64	23.86	29.73	32.01	30.25	39.69	38.12	48.42	54.16	59.48
Duke Energy Carolinas, LLC	44.49	46.03	43.17	47.55	47.91	47.85	55.89	55.36	55.62	58.19	59.28
Duke Energy Kentucky, Inc.	34.51	40.34	40.64	47.17	42.56	43.89	46.69	45.42	42.19	43.88	47.60
Duke Energy Progress	46.63	48.71	47.85	53.85	52.21	51.74	51.69	52.98	49.55	55.01	57.57
Entergy Arkansas, Inc.	42.64	31.84	35.77	40.09	43.24	37.22	47.21	46.06	39.69	54.64	54.73
Entergy Mississippi, Inc.	41.39	28.82	28.50	37.24	30.58	35.33	34.33	39.27	46.31	53.65	38.19
Kentucky Utilities Company	28.84	30.95	31.82	37.44	41.18	47.10	49.50	55.07	56.71	62.02	66.78
Louisville Gas and Electric Company	35.23	36.36	36.03	39.99	42.72	47.09	49.35	54.12	55.54	61.89	63.67
South Carolina Electric & Gas Company	49.86	50.09	53.69	54.29	54.65	59.70	64.78	69.42	71.41	76.67	81.66
Virginia Electric and Power Company	31.10	29.17	32.98	49.83	41.81	45.76	51.66	49.21	46.70	51.47	55.00
Peer Group Average	**$ 38.72**	**$ 38.00**	**$ 39.03**	**$ 45.11**	**$ 45.12**	**$ 47.28**	**$ 51.41**	**$ 52.98**	**$ 53.50**	**$ 59.47**	**$ 60.53**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	(Rank)										
Kentucky Power Company	**2**	**2**	**2**	**1**	**3**	**4**	**3**	**1**	**6**	**4**	**11**
Alabama Power Company	11	13	13	13	13	13	13	13	12	13	13
Ameren Missouri	7	8	8	7	9	11	10	11	11	11	8
Appalachian Power Company	1	1	1	2	2	1	2	2	5	5	7
Duke Energy Carolinas, LLC	10	10	10	9	10	9	11	10	9	8	6
Duke Energy Kentucky, Inc.	5	9	9	8	6	5	4	4	2	1	2
Duke Energy Progress	12	11	11	11	11	10	9	7	7	7	5
Entergy Arkansas, Inc.	9	6	6	6	8	3	5	5	1	6	3
Entergy Mississippi, Inc.	8	3	3	3	1	2	1	3	3	3	1
Kentucky Utilities Company	3	5	4	4	4	8	7	9	10	10	10
Louisville Gas and Electric Company	6	7	7	5	7	7	6	8	8	9	9
South Carolina Electric & Gas Company	13	12	12	12	12	12	12	12	13	12	12
Virginia Electric and Power Company	4	4	5	10	5	6	8	6	4	2	4

Source: FERC Form 1.

Peer Analysis Rate per MWh (Commercial)



Source: FERC Form 1.

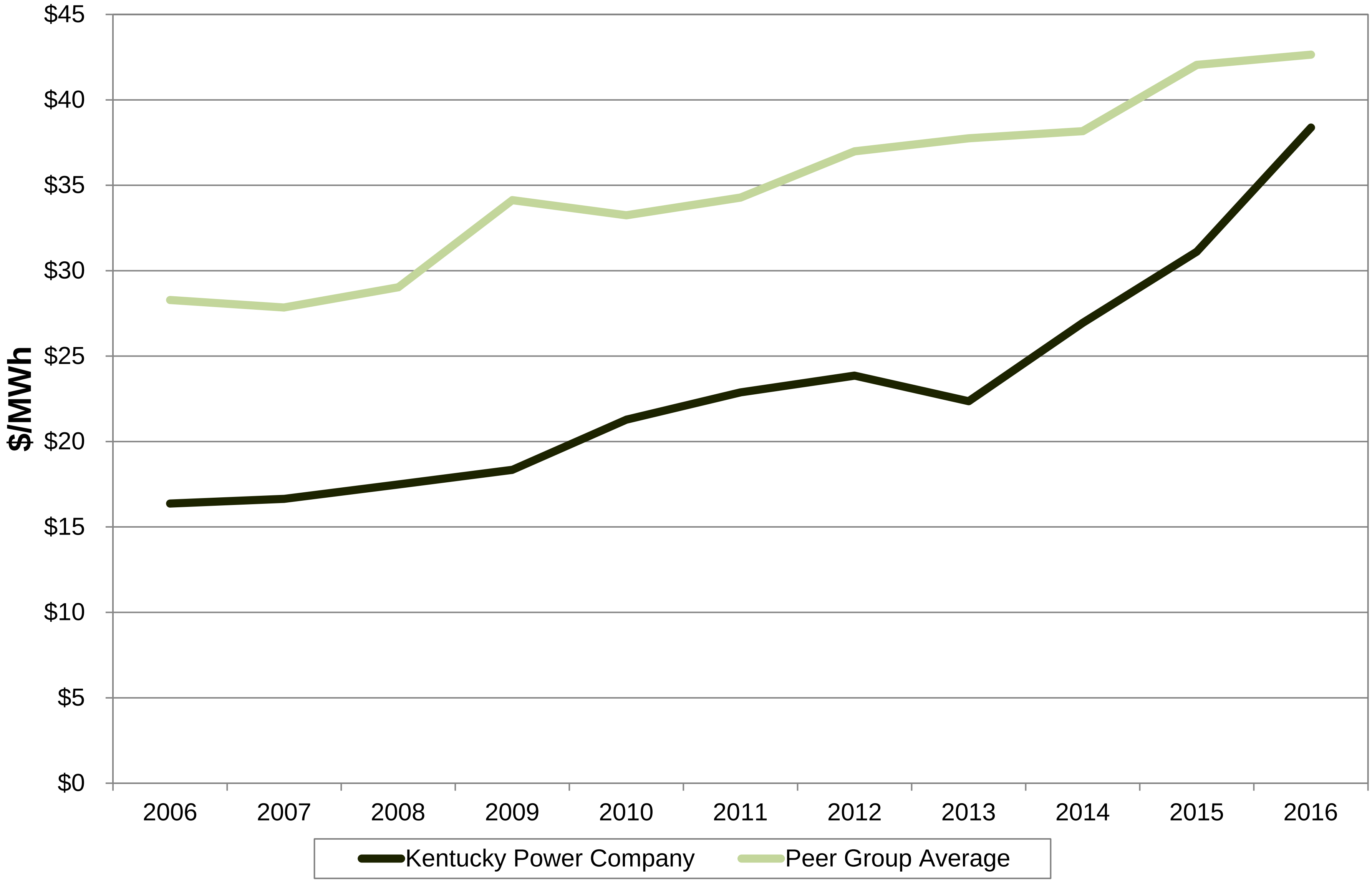
Peer Analysis Rate per MWh (Industrial)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	($/MWh)										
Kentucky Power Company	**$ 16.37**	**$ 16.64**	**$ 17.49**	**$ 18.34**	**$ 21.28**	**$ 22.88**	**$ 23.86**	**$ 22.36**	**$ 26.95**	**$ 31.11**	**$ 38.38**
Alabama Power Company	28.01	31.26	33.62	35.28	37.96	38.94	40.75	39.25	40.55	42.71	45.46
Ameren Missouri	28.69	28.23	28.31	31.72	32.17	36.57	36.63	41.26	39.74	42.68	47.14
Appalachian Power Company	16.84	16.37	17.21	24.23	25.01	23.10	30.47	29.90	37.78	41.47	44.51
Duke Energy Carolinas, LLC	31.39	32.75	30.55	34.99	34.49	34.31	40.44	39.44	40.79	43.87	42.89
Duke Energy Kentucky, Inc.	30.06	35.67	35.96	41.64	37.20	38.06	40.75	39.53	36.88	37.82	40.85
Duke Energy Progress	35.54	37.18	37.77	41.72	40.48	39.89	38.87	38.79	36.49	40.00	40.64
Entergy Arkansas, Inc.	34.09	25.39	29.07	33.40	35.26	30.06	38.42	37.25	31.84	44.29	43.39
Entergy Mississippi, Inc.	32.60	21.94	22.26	30.14	24.22	27.51	25.90	30.08	35.30	40.59	26.83
Kentucky Utilities Company	22.19	24.32	25.24	29.48	30.82	33.28	32.58	35.22	36.23	39.96	42.53
Louisville Gas and Electric Company	24.50	25.81	26.20	29.48	31.04	34.80	35.90	39.02	39.46	44.06	45.03
South Carolina Electric & Gas Company	32.08	32.62	36.63	37.76	37.77	40.16	43.01	45.39	46.82	47.21	49.98
Virginia Electric and Power Company	23.40	22.61	25.48	39.78	32.53	34.71	40.09	37.86	36.12	39.90	42.50
Peer Group Average	**$ 28.28**	**$ 27.85**	**$ 29.03**	**$ 34.13**	**$ 33.25**	**$ 34.28**	**$ 36.99**	**$ 37.75**	**$ 38.17**	**$ 42.05**	**$ 42.65**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	(Rank)										
Kentucky Power Company	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
Alabama Power Company	6	9	10	9	12	11	11	9	11	9	11
Ameren Missouri	7	8	7	6	6	9	6	12	10	8	12
Appalachian Power Company	2	1	1	2	3	2	3	2	8	7	9
Duke Energy Carolinas, LLC	9	11	9	8	8	6	10	10	12	10	7
Duke Energy Kentucky, Inc.	8	12	11	12	10	10	12	11	7	2	4
Duke Energy Progress	13	13	13	13	13	12	8	7	6	5	3
Entergy Arkansas, Inc.	12	6	8	7	9	4	7	5	2	12	8
Entergy Mississippi, Inc.	11	3	3	5	2	3	2	3	3	6	1
Kentucky Utilities Company	3	5	4	4	4	5	4	4	5	4	6
Louisville Gas and Electric Company	5	7	6	3	5	8	5	8	9	11	10
South Carolina Electric & Gas Company	10	10	12	10	11	13	13	13	13	13	13
Virginia Electric and Power Company	4	4	5	11	7	7	9	6	4	3	5

Source: FERC Form 1.

Peer Analysis Rate per MWh (Industrial)



Source: FERC Form 1.

Analysis of Company's Customer Costs

Account Description	Residential RS	Small General Service SGS	Medium General Service MGS-SEC	Medium General Service MGS-PRI	Medium General Service MGS-SUB	Large General Service LGS-SEC	Large General Service LGS-PRI	Large General Service LGS-SUB	Large General Service LGS-TRA
Customer Related Costs per Company's CCOSS									
Total Customer-Related Costs	$ 12,249,602	$ 3,465,334	$ 933,727	$ 239,813	$ 14,823	$ 297,786	$ 68,469	$ 138,535	$ 25,226
Number of Customers	136,607	24,022	6,507	78	6	740	60	17	2
Monthly Customer-Related Costs/Customer	$ 7.47	$ 12.02	$ 11.96	$ 256.21	$ 205.88	$ 33.52	$ 94.83	$ 679.09	$ 1,051.08
Customer Charge Revenue	$ 18,032,091	$ 5,044,708	$ 1,366,505	$ 46,800	$ 26,208	$ 755,055	$ 92,055	$ 128,214	$ 15,084
Monthly Customer Charge Revenue/Customer	$ 11.00	$ 17.50	$ 17.50	$ 50.00	$ 364.00	$ 85.00	$ 127.50	628.5	$ 628.50
Relationship of Customer Charge Revenues to Customer-Related Costs	147%	146%	146%	20%	177%	254%	134%	93%	60%

Source: Company's workpaper KPCO_R_KPSC_1_73_Attachment73_AEVWP3; and Kentucky Power's tariff.

Analysis of Company's Customer Costs

	Industrial General Service				Municipal Waterworks
	IGS-SE	IGS-PRI	IGS-SUB	IGS-TRA	MW
Customer Related Costs per Company's CCOSS					
Total Customer-Related Costs	$ 1,465	$ 35,582	$ 186,348	$ 32,951	$ 1,530
Number of Customers	4	35	26	3	10
Monthly Customer-Related Costs/Customer	$ 30.52	$ 84.72	$ 597.27	$ 915.31	$ 12.75
Customer Charge Revenue	$ 13,248	$ 115,920	$ 247,728	$ 48,708	$ 2,748
Monthly Customer Charge Revenue/Customer	$ 276.00	$ 276.00	$ 794.00	$ 1,353.00	$ 22.90
Relationship of Customer Charge Revenues to Customer-Related Costs	904%	326%	133%	148%	180%

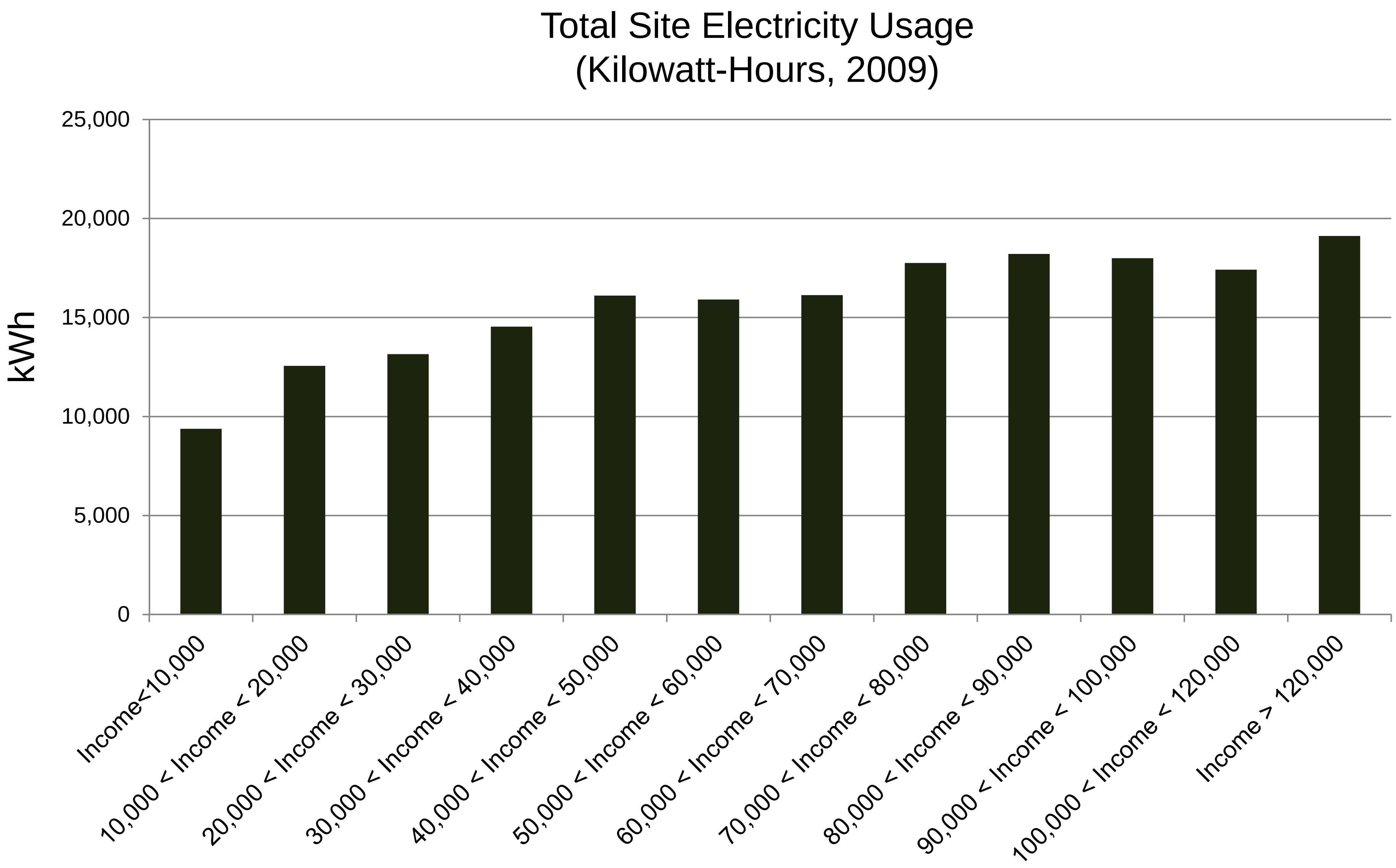
Source: Company's workpaper KPCO_R_KPSC_1_73_Attachment73_AEVWP3; and Kentucky Power's tariff.

Survey of Regional Customer Charges

State	Company	Customer Charge ($/month) Residential	Customer Charge ($/month) Commercial
KY	Kentucky Power Company	$ 11.00	$ 17.50
AL	Alabama Power Company	$ 14.50	N.A.
MO	Ameren Missouri	$ 9.00	$ 11.19
VA	Appalachian Power Company	$ 8.35	$ 10.25
WV	Appalachian Power Company	$ 8.00	$ 9.50
NC	Duke Energy Carolinas, LLC	$ 11.80	$ 19.39
SC	Duke Energy Carolinas, LLC	$ 8.29	$ 10.52
KY	Duke Energy Kentucky, Inc.	$ 4.50	$ 7.50
NC	Duke Energy Progress	$ 11.13	$ 16.45
SC	Duke Energy Progress	$ 9.06	$ 9.91
AR	Entergy Arkansas, Inc.	$ 8.40	$ 24.25
MS	Entergy Mississippi, Inc.	$ 6.75	$ 7.67
KY	Kentucky Utilities Company	$ 12.25	$ 31.50
KY	Louisville Gas and Electric Company	$ 12.25	$ 31.50
SC	South Carolina Electric & Gas Company	$ 10.00	$ 22.75
NC	Virginia Electric and Power Company	$ 10.96	$ 19.79
VA	Virginia Electric and Power Company	$ 7.00	$ 12.40

Note: Appalachian Power Company's charges are based on Distribution Charges only.
Source: Company tariffs.

Usage by Income



Source: 2009 Residential Electricity Consumption Survey ("RECS")

Regression Analysis Results

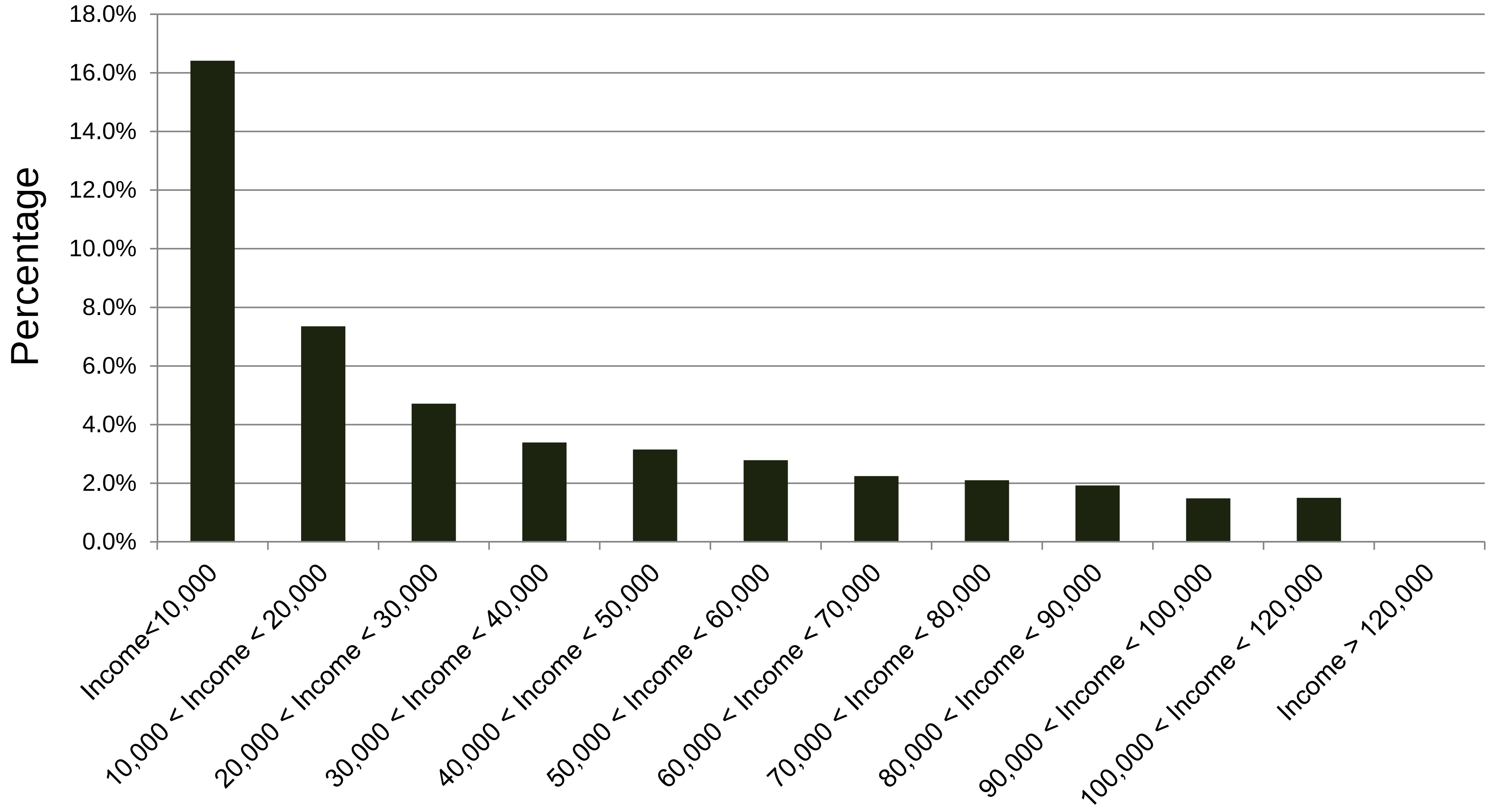
Regression Results

Dependent Variable	Electricity Expenditure			
Observations	848			
F-Statistic	114.5			
R-squared	0.274			
Independent Var.	Coef	SE	t	p-value
Ln(Household Income)	0.0663064	0.0184646	3.59	0.0000
Ln(Square Footage)	0.2248405	0.0284459	7.9	0.0000
Ln(HH Members)	0.3272310	0.0295888	11.06	0.0000
Constant	4.5289330	0.2130319	21.26	0.0000

Note: Robust Standard Errors Presented.
Source: 2009 Residential Electricity Consumption Survey (“RECS”)

Consumption as Percent of Income

Witness: Dismukes
Case No. 2017-00179
Exhibit DED-8
Page 1 of 1



Source: 2009 Residential Electricity Consumption Survey (“RECS”)

Analysis of Company's Customer Counts, Sales, and Revenues (2006 – 2016)

	2006	2007	2008	2009	2010
Customers	175,571	175,705	175,646	174,994	174,579
Sales (MWh)	7,122,459	7,114,506	7,241,902	7,068,456	7,348,529
Revenues ($)	$ 391,934,420	$ 406,102,663	$ 476,235,627	$ 487,997,590	$ 541,079,466

	2011	2012	2013	2014	2015	2016
Customers	173,641	172,757	172,138	171,011	170,020	168,848
Sales (MWh)	6,983,163	6,660,656	6,537,521	6,531,904	6,218,801	5,862,697
Revenues ($)	$ 559,169,090	$ 501,036,751	$ 512,201,281	$ 556,434,077	$ 537,055,812	$ 572,810,777

Source: FERC Form 1.