COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

THE APPLICATION OF SOUTH KENTUCKY RURAL ELECTRIC COOPERATIVE CORPORATION FOR APPROVAL OF MASTER POWER PURCHASE AND SALE AGREEMENT AND TRANSACTIONS THEREUNDER	)	**Case No. 2018-00050**

DIRECT TESTIMONY

OF

JOHN WOLFRAM
PRINCIPAL
CATALYST CONSULTING LLC

ON BEHALF OF

BIG SANDY RURAL ELECTRIC COOPERATIVE CORPORATION
BLUE GRASS ENERGY COOPERATIVE CORPORATION
CLARK ENERGY COOPERATIVE, INC.
CUMBERLAND VALLEY ELECTRIC INC.
FARMERS RURAL ELECTRIC COOPERATIVE CORPORATION
FLEMING-MASON ENERGY COOPERATIVE, INC.
GRAYSON RURAL ELECTRIC COOPERATIVE CORPORATION
INTER-COUNTY ENERGY COOPERATIVE CORPORATION
JACKSON ENERGY COOPERATIVE CORPORATION
LICKING VALLEY RURAL ELECTRIC COOPERATIVE CORPORATION
NOLIN RURAL ELECTRIC COOPERATIVE CORPORATION
OWEN ELECTRIC COOPERATIVE INC.
SALT RIVER ELECTRIC COOPERATIVE CORPORATION
SHELBY ENERGY COOPERATIVE INC.
TAYLOR COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

FILED: **April 12, 2018**

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I. INTRODUCTION

Q. Please state your name, business address, and position.

A. My name is John Wolfram. I am the Principal of Catalyst Consulting LLC. My business address is 3308 Haddon Road, Louisville, Kentucky, 40241.

Q. On whose behalf are your testifying?

A. I am testifying on behalf of Big Sandy Rural Electric Cooperative Corporation, Blue Grass Energy Cooperative Corporation, Clark Energy Cooperative, Inc., Cumberland Valley Electric Inc., Farmers Rural Electric Cooperative Corporation, Fleming-Mason Energy Cooperative, Inc., Grayson Rural Electric Cooperative Corporation, Inter-County Energy Cooperative Corporation, Jackson Energy Cooperative Corporation, Licking Valley Rural Electric Cooperative Corporation, Nolin Rural Electric Cooperative Corporation, Owen Electric Cooperative Inc., Salt River Electric Cooperative Corporation, Shelby Energy Cooperative Inc., Taylor County Rural Electric Cooperative Corporation (collectively the "Distribution Cooperatives").

Q. Briefly describe your education and work experience.

A. I received a Bachelor of Science degree in Electrical Engineering from the University of Notre Dame in 1990 and a Master of Science degree in Electrical Engineering from Drexel University in 1997. I founded Catalyst Consulting LLC in June 2012. I have developed cost of service studies and rates for numerous electric and gas utilities, including electric distribution cooperatives, generation and transmission cooperatives, municipal utilities and investor-owned utilities. I have performed economic analyses, rate mechanism reviews, special rate designs, and wholesale formula rate reviews. From March 2010 through May 2012, I was a Senior Consultant with The Prime Group, LLC. I have also been employed by the parent companies of Louisville Gas and Electric Company ("LG&E") and Kentucky Utilities Company ("KU"), by the PJM Interconnection, and by the Cincinnati Gas & Electric Company. A more detailed description of my qualifications is included in Exhibit JW-1.

Q. Have you ever testified before the Kentucky Public Service Commission ("Commission")?

A. Yes. I have testified in numerous regulatory proceedings before this Commission. A listing of my testimony in other proceedings is included in Exhibit JW-1.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to (i) review and assess the analysis of the Master Power Purchase and Sale Agreement and related transactions thereunder ("PPA" or "Transaction") that was provided by South Kentucky R.E.C.C. ("South Kentucky") in its Application in this proceeding, and (ii) describe the results of the independent analysis that I performed to quantify the economic impacts of the proposed PPA on East Kentucky Power Cooperative ("EKPC") and its Owner Members, including South Kentucky.

Q. Are you sponsoring any exhibits?

A. Yes. I have prepared the following exhibits to support my testimony:

Exhibit JW-1 – Qualifications of John Wolfram

Exhibit JW-2 – Estimated Cost Shift Analysis

III. REVIEW OF APPLICANT'S ANALYSIS OF PROPOSED PPA

Q. Did you review the analysis of the proposed PPA provided by South Kentucky in its Application?

A. Yes. I reviewed the Application and Exhibits, including the Direct Testimony of South Kentucky witnesses Mr. Dennis Holt, Ms. Michelle Hermann, and Mr. Carter Babbit. I also reviewed the responses by South Kentucky to requests for information in this docket.

Q. What is your overall opinion of the proposed Transaction?

A. In my view, South Kentucky has failed to demonstrate that the Commission should find the Transaction to be fair, just and reasonable. First, South Kentucky's evaluation of the Transaction is insufficient and flawed. Second, the Transaction imposes an unreasonable degree of risk upon South Kentucky. Third, the Transaction fails to address other regulatory and legal concerns. Finally, the Transaction would result in a cost shift to the remaining EKPC Owner Members of between $15.9 million and $18.3 million per year. I will explain the specific support for each of these conclusions in the sections of my testimony that follow.

A. South Kentucky's Evaluation of the Transaction is Insufficient and Flawed.

Q. Why do you consider South Kentucky's evaluation of the Transaction to be insufficient and flawed?

A. There are several reasons. The first is that South Kentucky did not include in its analyses all of the anticipated or potential incremental costs that South Kentucky would incur pursuant to its membership in PJM. This problem refers to the Net Present Value ("NPV") analysis described in the Direct Testimony of Mr. Carter Babbit and summarized in Exhibits CB-4, CB-5, CB-9 and CB-10 of his testimony.

Q. How did South Kentucky fail to properly analyze all of the costs to be incurred pursuant to membership in PJM?

A. South Kentucky failed to properly analyze all of the cost impacts of PJM in several ways:

1) South Kentucky failed to properly consider in the NPV analyses some of the charge types that PJM includes on member bills. For the items South Kentucky did include, South Kentucky used PJM per-unit charges in its NPV analyses which do not reconcile with published PJM rates.

   a. South Kentucky miscalculated the cost of Network Integration Transmission Service ("NITS"). South Kentucky used [redacted] as the NITS transmission rate for 2017 and escalated that amount at [redacted] annually.[1] The actual EKPC NITS rate per the PJM OATT for 2017 was $2.022 per kW-month, which is [redacted] higher than the value South Kentucky used for 2017.[2] Not only did South Kentucky use an inaccurate rate in Exhibit CB-10, but they also applied this rate to the kWh instead of kW.[3] Correcting for these errors increases the cost of the Transaction by approximately $600,000 for 2021 and escalating for the

[1] See Exhibit CB-10 workpapers provided in the Response to DC 1-30.
[2] See PJM OATT rates for EKPC for 2017 posted at http://www.pjm.com/markets-and-operations/billing-settlements-and-credit/formula-rates.aspx
[3] South Kentucky acknowledged the kWh error in the Response to EKPC 2-27 part c.

subsequent years, for a total NPV reduction of approximately $9 million over the Transaction period.

b. South Kentucky miscalculated the cost of PJM OATT Schedule 1-A for Transmission Owner Scheduling, System Control and Dispatch Service. South Kentucky used [redacted]/MWh for 2017.[4] The actual rate for this service for EKPC in December 2017 was $0.2695/MWh,[5] which is almost [redacted] larger than the amount used by South Kentucky in its NPV analysis. Correcting for this error increases the cost of the Transaction by approximately $98,000 for 2021 and escalating for the subsequent years, for a total NPV reduction of approximately $1.4 million over the Transaction period.

c. South Kentucky did not demonstrate that it properly included all of the appropriate PJM charge types in its NPV analysis.[6] It is simply not clear whether South Kentucky took into account in their evaluation all of the charge types from the PJM billing statement that will apply to South Kentucky.

2) South Kentucky did not rely upon a PJM capacity price forecast for the period applicable to the Transaction. South Kentucky used actual PJM capacity auction pricing for 2018 - 2021 but did not rely upon PJM capacity price forecasts for the years after 2021.[7] In the Transaction, South Kentucky proposes a financial hedge with a capacity price point of [redacted] How

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[4] See footnote 1.
[5] See footnote 2.
[6] See Response to DC 2-26, in which South Kentucky described the purpose of the 14 PJM charge types that were included in the NPV analysis, but did not explain how or where the other 100+ billing codes were addressed.
[7] See Response to DC 1-33.

can the Commission determine if the proposed capacity hedge is reasonable over a twenty-year period if no projection of capacity prices was used to set the hedging price point beyond the first year? It cannot. Simply having a hedge does not make it reasonable; the price point must be set appropriately in accordance with the risk. South Kentucky has provided no evidence to support the reasonableness of the capacity hedge price point and thus it is impossible to assess the reasonableness of the capacity hedge proposed in the Transaction.

3) South Kentucky failed to adequately consider the long-term costs of membership in PJM. RTO members can be responsible for numerous costs, including a share of costs of large transmission projects which may escalate as the PJM Regional Transmission Expansion Plan ("RTEP") changes each year. South Kentucky included a charge for RTEP projects of [redacted] for 2017 and escalated that amount at [redacted] annually.[8] The annual increase is arbitrary and unsupported; for 2017, the reported rate was \$0.64/MWh, or [redacted] higher than the 2016 amount used by South Kentucky in its calculations.[9] At the rate used by South Kentucky for the 508,080 MWh of the Alternate Source usage in 2021, this amounts to nearly [redacted] per year. When you compare this to data provided by PJM, however, this amount appears understated. The PJM "Transmission Enhancement Worksheet for December 2017"[10] shows that in December alone, PJM allocated \$288,408 to EKPC for the TrAIL and PATH projects combined. If this is annualized and then sub-allocated to South

[8] See footnote 1.
[9] The PJM IMM 2017 State of the Market Report, Table 1-9, shows the Transmission Enhancement Cost Recovery price for 2011 at \$0.27/MWh and for 2017 at \$0.64/MWh, or an increase of 237%. See http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2017/2017-som-pjm-volume2.pdf
[10] http://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx

Kentucky,[11] the annual cost for these two projects to South Kentucky would be nearly $450,000, or [redacted] more annually than South Kentucky included in its NPV analysis. Furthermore, the data provided by South Kentucky [12] shows that the charge for Transmission upgrades from 2010 to 2013 increased by over 400%, and for 2014 to 2016 increased by 24%.[13] This indicates that the [redacted] escalation rate used in the NPV analysis is not supported and is significantly understated based on what is known about RTEP costs today. Finally, since FERC Order No. 1000 was issued in 2011, PJM's Transmission Enhancement Cost Recovery price has more than doubled;[14] if this trend continues, RTEP costs could increase even more in the future. For example, if the Transmission Enhancement Cost recovery price reported in the PJM State of the Market Report increases by 20% every year, South Kentucky's costs will increase by $65,000 per year.[15] These facts demonstrate that South Kentucky has underestimated the costs of existing PJM transmission enhancement projects and has failed to address the potential dramatic increases in these costs in the future.

4) The Transaction does not permit South Kentucky to terminate the PPA due to increases in PJM costs. But PJM's costs to its members are subject to change, and the length of the PPA creates a risk that South Kentucky could be subject to significant increases in PJM costs with no way to exit the PPA. South Kentucky failed to consider this risk.

[11] The allocation to South Kentucky is based on South Kentucky's share of EKPC demand, or 13%.
[12] See footnote 1.
[13] See DC Attachment 30 (CB4), Tab "PJM Summary" Row 7.
[14] See footnote 9.
[15] Based on 58 MW x 8,760 hours x $0.64/MWh x 20%.

5) South Kentucky does not have an agency agreement in place with EKPC and does not provide sufficient support for the estimated costs of such an agreement over the term of the Transaction. The entire concept of the agency agreement[16] is speculative in nature, particularly given the proposed twenty year term of the Transaction. The presumption that such an agency agreement will so neatly address all of South Kentucky's obligations for membership in PJM at a cost so loosely estimated[17] oversimplifies a process that is complex – so complex that these activities are often outsourced to third parties by utility companies that are far more familiar with wholesale energy markets than is South Kentucky. The uncertainty and lack of support around the agency agreement cost is a serious deficiency in the analysis of the proposed Transaction.

Q. In what other ways is South Kentucky's evaluation of the Transaction insufficient or flawed?

A. Other shortcomings or flaws include the following:

1) South Kentucky failed to demonstrate that the "significant savings" it expects to realize from the Transaction "far outweigh" the potential risks.[18] In fact, South Kentucky did not quantify the risks that it identified for its Board of Directors.[19] South Kentucky identified seven (7) risks and described the mitigation of those risks without any quantification or in-depth analysis.[20] South Kentucky asserts that the Transaction will result in wholesale power cost savings totaling between [redacted]

[16] See page 13 of Mr. Holt's testimony and page 12 of Mr. Babbit's testimony.
[17] See response to EKPC 1-22.
[18] Direct Testimony of Mr. Dennis Holt, page 14, lines 19-20.
[19] See the Response to Staff 1-18.
[20] See the Response to Staff 1-2 and 1-18.

[redacted] and [redacted] in NPV savings over twenty years,[21] but these amounts do not take into consideration any quantification of the potential risks. Such quantification was simply not performed, rendering South Kentucky's already problematic analysis of the Transaction even more deficient.

2) South Kentucky failed to perform robust sensitivity analyses around key variables.[22] South Kentucky performed a "base case" analysis[23] which amounts to an evaluation of only one of a wide array of possible outcomes. South Kentucky should have identified key variables (transmission rates, wholesale rate changes, environmental cost changes, escalation rates, gas prices, etc.) and performed sensitivity or scenario analyses around different assumptions for these variables in order to determine the NPV of the Transaction under a range of different situations. Scenario analysis of this sort is typical for least-cost analyses, and the Commission has recognized the importance of robust, comprehensive scenario analyses in previous cases.[24] But South Kentucky did not perform these robust sensitivity analyses.[25] This makes it impossible to assess what value the Transaction might provide if any conditions other than those assumed by South Kentucky come to fruition – which is highly probable given the number of variables and the lengthy

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[21] See Application, page 2.

[22] In fact, in its Application, South Kentucky provided NPV summary tables without providing any of the details or substance of its base NPV analysis; the Distribution Cooperatives had to request not only the supporting documentation but also the actual NPV tables in a data request.

[23] See the Response to DC1-30.

[24] See Case No. Case No. 2012-00578, Commission Order dated October 7, 2013, "Significantly, Kentucky Power's economic modeling took into account a wide range of reasonable alternatives… In addition to a base commodity price scenario, Kentucky Power also used four additional pricing scenarios to reflect the effects of higher fuel costs, lower fuel costs, an earlier carbon-pricing date, and no carbon pricing… Sensitivity and break-even analyses also demonstrated that the Mitchell acquisition is the least-cost option. Accordingly, we conclude that the proposed Mitchell acquisition represents the least-cost alternative to meeting Kentucky Power's capacity and energy needs and would not result in wasteful duplication of facilities."

[25] The only sensitivity analysis provided in the Application was in Exhibit CB-8, which provided summary results (but no supporting data) for different capacity price outcomes in the NPV analysis.

term of the Transaction. The failure to perform robust sensitivity analyses is a major deficiency in this Application.

3) South Kentucky failed to properly consider how potential changes in environmental laws can affect the Transaction. The Transaction price is subject to adjustment for Additional Environmental Costs due to a Change in Law.[26] However, South Kentucky presumes that any change in environmental law would have no impact relative to the status quo. South Kentucky asserts that it "faces the same or essentially similar risks whether it purchases power from Morgan Stanley, EKPC or any other energy provider with sound financial standing"[27] -- but this oversimplifies the risk because Morgan Stanley is not tied to a specific generating unit or units within PJM.[28] Without any knowledge of the unit(s) that will source the Transaction, it is unreasonable to assert that any changes in environmental laws or regulations will equivalently impact the Transaction and EKPC under the status quo. For this reason the consideration of how changes in environmental laws or regulations can affect the Transaction is insufficient.

4) South Kentucky notes that the Transaction provides the benefit of "fuel diversity."[29] However, because the Alternate Source is not tied to a specific generating unit or units within PJM,[30] it is not possible to support this claim; any fuel diversity benefit is at best uncertain and at worst illusory.

5) South Kentucky failed to properly consider how EKPC's wholesale electric rates will increase as a result of the PPA. This is the case on several levels. First, the

[26] See Application, Firm Physical Energy Confirmation, Paragraph 17.
[27] See the Response to AG 1-5.
[28] See the Response to PSC 1-5.
[29] See the attachment to the Response to Staff 1-2, slide number 10.
[30] See footnote 28.

NPV should take into account the fact that the power South Kentucky continues to purchase from EKPC will cost more per unit than under the status quo. The status quo analysis assumed EKPC's rate to South Kentucky would remain unchanged for four years and then escalate at [redacted] per year.[31] However, this assumption is unsupported; South Kentucky relied upon a forecast provided by EKPC dated April 7, 2015, and "adjusted" those three-year old numbers for this analysis.[32] Furthermore, while this assumption pertains to EKPC's Rate E, South Kentucky fails to consider the effects of the Transaction on EKPC's other rate classes, including Rates B and C, under which South Kentucky also takes service. Finally, South Kentucky ignores the possibility that EKPC will develop a new wholesale rate that properly charges South Kentucky for the provision of service to its remaining load if the Transaction is approved. The Transaction will remove 58 MW at 100% load factor, which could measurably impact EKPC's cost-to-serve; EKPC could respond to these impacts by designing a new rate to properly compensate EKPC for serving South Kentucky's remaining load. For these reasons, South Kentucky's assumptions about wholesale purchased power costs are oversimplified and deficient.

6) South Kentucky incorrectly excluded FAC and ES costs from the South Kentucky estimated wholesale power costs. South Kentucky simply ignored the effects of the FAC and the ES on the determination of all-in costs in $/MWh for both the Base Case (status quo) and the Base Alternate Supply case.[33] Because the FAC and ES calculations differ for EKPC under the two scenarios, as I explain later in my

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[31] See footnote 1 and Direct Testimony of Mr. Carter Babbit, page 8.
[32] See the Response to DC 2-27 and EKPC 2-1.
[33] See Exhibit CB-10 workpapers provided in Response to DC1-30.

testimony, it is incorrect to omit the FAC and ES from the NPV evaluation; the costs compared in the NPV evaluation are incorrect.

7) South Kentucky did not use the currently-approved EKPC demand and energy charges in its NPV analyses.[34] The Commission approved a roll-in of the FAC and reduction of EKPC's base rates in its Order dated August 7, 2017 in Case No. 2017-00002 which South Kentucky did not take into account. This error further demonstrates the importance of including the FAC in the analysis, because fuel costs are collectively recovered in both base rates and the FAC. South Kentucky failed to analyze this.

8) South Kentucky did not determine or include the costs of obtaining a letter of credit.[35] South Kentucky did not compute the estimated total dollar amount or include such an amount in the NPV analysis in Exhibit CB-10. This is yet another cost understatement in the Application.

B. <u>The Transaction Imposes an Unreasonable and Unevaluated Degree of Risk upon South Kentucky.</u>

Q. Why do you think that the Transaction imposes an unreasonable and unevaluated degree of risk upon South Kentucky?

A. There are several reasons, including the following.

1) The twenty-year term of the Transaction is unreasonably long for a purchased power agreement of this nature. While in my experience agreements of this length are common for all-requirements contracts between distribution cooperatives and G&T cooperatives, it is not common for PPA transactions like this which do not involve utilities that own specific generation assets. In this particular instance, the

[34] See Exhibit CB-10 workpapers provided in Response to DC1-30.
[35] See the Response to EKPC 1-15.

Alternate Source has not even been identified and is likely not subject to Commission jurisdiction; either of these could lead to significant problems over a twenty-year horizon as market, legal, regulatory, environmental, economic, technological, and societal conditions change. The uncertainty surrounding these changing conditions over such a long time period is unreasonably high.

2) The PJM market is very complex and dynamic, and thus poses significant uncertainty risk to South Kentucky over the twenty year term of the Transaction. For perspective on this point, consider these points:

   a. Twenty years ago this year, PJM first introduced its bid-based energy market based on Locational Marginal Prices.
   b. Two years after that, PJM introduced markets for ancillary services, regulation service, and Day-Ahead energy.
   c. The first capacity auction took place eleven years ago.
   d. In 2015, PJM revised is capacity auction to incorporate a capacity performance product, directly linking capacity payments with generator performance.
   e. In 2017, PJM proposed additional market pricing reforms.
   f. On April 9, 2018, PJM filed two competing proposals on capacity market reform with FERC for consideration, including both a two-part capacity repricing proposal supported by PJM staff and a proposal from its independent market monitor to expand minimum pricing rules.

These facts demonstrate how much can change over twenty years. This transforming market climate in PJM poses particular risks to South Kentucky over a very long twenty-year Transaction term.

3) The Transaction requires South Kentucky to join PJM. This introduces a constraint on South Kentucky that does not exist under the status quo. South Kentucky must remain a PJM member for twenty years, but EKPC is under no such obligation and, should circumstances warrant, EKPC could explore and pursue the option to exit PJM at any time over the next two decades. This constraint reduces South Kentucky's flexibility for managing uncertainty over a long term horizon. For this reason, the requisite PJM membership combined with the twenty year term place risks on South Kentucky that exceed the risks that EKPC faces under the status quo arrangement.

4) The Transaction does not sufficiently protect South Kentucky against failures on the part of Morgan Stanley to deliver the energy as contracted. No matter how many times Morgan Stanley fails to deliver, so long as Morgan Stanley pays the Replacement Price, South Kentucky has no right to terminate the PPA. This is an unreasonable arrangement.

C. <u>The Transaction Fails to Address Other Regulatory and Legal Concerns.</u>

Q. Why do you think that the Transaction fails to address other regulatory and legal concerns?

A. The Transaction as proposed presents a number of open issues, and it is unclear whether some of those "loose ends" might create a default condition under the PPA. These could create significant legal or regulatory concerns, including the following:

1) South Kentucky has neither completed nor secured Commission approval of an agency agreement between it and EKPC for EKPC to act as market participant for South Kentucky in PJM. Given the extent to which South Kentucky has oversimplified the issue of membership in PJM, this is a significant concern. The fact that South Kentucky has neither finalized nor requested approval for all of the elements necessary for this arrangement to work raises several questions:
    a. If the Transaction is approved, what happens if South Kentucky and EKPC do not reach agreement on the terms and conditions of an agency agreement? Does this create a default under the PPA?
    b. If an agreement is reached with EKPC, what happens if the Commission does not approve it? Does this create a default under the PPA?
    c. What happens if the agency agreement addresses some of the PJM-related activities, but not all? Will South Kentucky engage another outside entity to perform the remaining tasks? If so, at what cost? If this happens after the Commission approves the Transaction, should this trigger a review by the Commission of its approval of the Transaction?
    d. What happens if the cost of the agency agreement is much higher than the amount South Kentucky included in the NPV analyses? Should this trigger a review by the Commission of its approval of the Transaction?
    e. If the Commission approves the Transaction, does South Kentucky's subsequent request for Commission approval of an agency agreement place the Commission in the untenable position of having to approve the agency agreement in order to effectuate its approval of the Transaction?

The fact that South Kentucky has neither completed nor secured Commission approval of an agency agreement between it and EKPC is a legitimate concern that could create numerous legal and/or regulatory challenges in the future.

2) South Kentucky makes no provision in the PPA for any exercise of jurisdiction by the Commission after its initial approval. The Cover Sheet provides that Section 10.19 of the EEI Master Agreement is amended such that all disputes are to be heard exclusively by the U.S. District Court for the Eastern District of Kentucky, Lexington Division. I understand this to mean that as far as South Kentucky is concerned, once the Commission approves this Transaction, the Commission has no further jurisdiction over it. This is a legitimate concern.

IV. <u>ANALYSIS OF ECONOMIC IMPACTS OF PROPOSED PPA ON EKPC AND ITS OWNER MEMBERS</u>

Q. Did you perform an evaluation of the economic impacts of the Transaction on EKPC and its Owner-Members?

A. Yes. Using data provided by EKPC for the billing determinants for 2017, I prepared an estimate of the annual wholesale purchased power savings achieved by South Kentucky, and of the wholesale costs that would be shifted to the other Owner Members of EKPC (and to South Kentucky for its load still served under the wholesale contract with EKPC) under a set of basic assumptions.

Q. What assumptions did you rely on for this analysis?

A. For this analysis I assumed that (a) the 2017 billing determinants (i.e. kW, kWh, FAC revenue, ES revenue, and Total Revenue for each of the EKPC rate classifications as provided by EKPC) comprise a representative twelve months with no need for any *pro forma* adjustments; (b) the EKPC system is approximately half fixed cost and half variable cost; [36] (c) after the removal of the Alternate Source energy for South Kentucky, the ES would increase to account for the change, and the FAC may also increase; and (d) the Alternate Source energy related only to South Kentucky's wholesale service under Rate E – Option 2. I also assumed perfect rate treatment (meaning that I ignored the effects of regulatory lag and any adjustments that might be made in rate case proceedings), and I excluded any potential mitigation of the effects of the Transaction by EKPC.

Q. How did you address the Fuel Adjustment Clause ("FAC") in your analysis?

A. The FAC is determined each month on the ratio of actual fuel costs and consumption for the period less the ratio of the base amounts of these two items. If the Transaction is approved, both the total fuel cost and the total consumption amounts for a month will change. Because both the numerator and the denominator in this calculation will change, it is difficult to accurately estimate how the monthly FAC revenue amounts will change. Furthermore, the FAC works hand in hand with base energy charges, in that both work together to allow EKPC to recover its full cost of fuel. While the FAC alone may only reflect variable costs, the base energy charge with which the FAC is paired recovers both variable and fixed costs.[37] Because of these uncertainties, I approached the FAC in two ways. First, I assumed that there is no cost shift associated with the FAC revenues, assuming they are 100% variable costs. Second, I assumed that all of the FAC costs avoided by South Kentucky will have to be recovered from the

[36] See attachment to South Kentucky's response to AG 1-1.
[37] See Nucor Steel Gallatin Response to South Kentucky R.E.C.C. Objection to Its Intervention, pg. 6.

other Owner Members. The ultimate outcome is likely to fall somewhere between these two scenarios, which serve as boundaries for the cost shift with respect to the FAC.

Q. How did you address the Environmental Surcharge ("ES") in your analysis?

A. The ES is determined each month as a percentage of total revenue. If the Transaction is approved, base revenue will decline, which would cause the ES factor to increase. For this analysis, I used the estimated changes in revenue for base rates and FAC to determine the change in the ES factor given that the ES cost savings for South Kentucky would be shifted to the other Owner Members.

Q. Please describe the wholesale purchased power cost savings estimated for South Kentucky.

A. I estimate that under the Transaction, South Kentucky will avoid purchased power expenses from EKPC of approximately $30 million annually. This is before any determination of costs shifted to South Kentucky for its load still served under the wholesale contract with EKPC. See Table 1.

Table 1.
South Kentucky: Estimated Gross Savings

KW	KWH	Base Rev Demand $	Base Rev Energy $	FAC $	ES $	Total Rev $
58,000	508,080,000	4,189,920	23,888,080	(2,361,379)	4,262,372	29,978,993

Q. Please describe the estimated cost shifts that the EKPC Owner Members would experience.

A. The analysis of cost shifts is provided in full detail in Exhibit JW-2, portions of which are replicated below for convenience. The estimated effects of the resultant cost shift on the EKPC Owner Members (including South Kentucky for its load that remains under the EKPC wholesale contract) without any cost shifting of the FAC costs are listed in Table 2.

Table 2.
Estimated Cost Shift to EKPC Owner Members (No FAC)

Owner Member	Base Rev Demand $	Base Rev Energy $	FAC $	ES $	Total Rev $
BIG SANDY RECC	80,230	166,563	-	78,273	325,067
BLUE GRASS ENERGY	459,334	1,037,591	-	460,879	1,957,803
CLARK ENERGY COOP	155,921	322,867	-	151,991	630,779
CUMBERLAND VALLEY ELECTRIC	154,144	333,792	-	152,476	640,412
FARMERS RECC	168,977	396,451	-	171,784	737,211
FLEMING MASON RECC	353,484	1,003,508	-	385,796	1,742,788
GRAYSON RECC	86,111	194,585	-	86,411	367,106
INTER-COUNTY ECC	173,404	347,749	-	167,315	688,468
JACKSON ENERGY COOP	319,041	655,723	-	310,253	1,285,018
LICKING VALLEY RECC	85,939	190,467	-	85,672	362,078
NOLIN RECC	266,038	584,811	-	264,482	1,115,330
OWEN EC	677,567	1,878,429	-	732,654	3,288,649
SALT RIVER RECC	393,395	931,966	-	401,295	1,726,656
SHELBY ENERGY COOP	154,271	405,979	-	163,518	723,768
SOUTH KENTUCKY RECC	471,546	954,713	-	456,363	1,882,621
TAYLOR COUNTY RECC	190,518	443,887	-	193,212	827,617
TOTAL	4,189,920	9,849,080	-	4,262,372	18,301,372

This amounts to an estimated 2.3% increase on average for the other Owner Members wholesale purchased power costs.

The estimated effects with full cost shifting of the FAC costs are listed below in Table 3.

Table 3.
Estimated Cost Shift to EKPC Owner Members (With FAC)

Owner Member	Base Rev Demand $	Base Rev Energy $	FAC $	ES $	Total Rev $
BIG SANDY RECC	80,230	166,563	(41,511)	78,273	283,556
BLUE GRASS ENERGY	459,334	1,037,591	(251,785)	460,879	1,706,019
CLARK ENERGY COOP	155,921	322,867	(80,533)	151,991	550,246
CUMBERLAND VALLEY ELECTRIC	154,144	333,792	(82,071)	152,476	558,340
FARMERS RECC	168,977	396,451	(95,106)	171,784	642,106
FLEMING MASON RECC	353,484	1,003,508	(228,248)	385,796	1,514,540
GRAYSON RECC	86,111	194,585	(47,213)	86,411	319,893
INTER-COUNTY ECC	173,404	347,749	(87,659)	167,315	600,809
JACKSON ENERGY COOP	319,041	655,723	(163,957)	310,253	1,121,061
LICKING VALLEY RECC	85,939	190,467	(46,492)	85,672	315,586
NOLIN RECC	266,038	584,811	(143,114)	264,482	972,217
OWEN EC	677,567	1,878,429	(429,922)	732,654	2,858,727
SALT RIVER RECC	393,395	931,966	(222,928)	401,295	1,503,729
SHELBY ENERGY COOP	154,271	405,979	(94,235)	163,518	629,533
SOUTH KENTUCKY RECC	471,546	954,713	(239,899)	456,363	1,642,723
TAYLOR COUNTY RECC	190,518	443,887	(106,708)	193,212	720,909
TOTAL	4,189,920	9,849,080	(2,361,379)	4,262,372	15,939,993

This amounts to an estimated 2.0% increase on average for the other Owner Members wholesale purchased power costs.

Thus, depending on what assumptions apply to the FAC, the total cost shift to the Owner Members from the proposed Transaction is in the range of $15.9 million to $18.3 million annually. This is comparable to the estimated cost shifts described in the record,[38] in which EKPC estimated the total cost shift as of December 27, 2017 without any mitigation to be approximately $17.1 million for the 12 month period ending November 2017.

Q. How would the estimated cost shift impact Nucor Steel Gallatin?

[38] See attachments to the Responses to AG 1-1 and Nucor 1-1

A. Overall, since Nucor Steel Gallatin ("Nucor") comprises about one third of the total revenues for Owen Electric, the estimated impact on Nucor is one-third of the cost shift allocated to Owen Electric, or approximately $1 million per year. The immediate impact on Nucor is driven by the change to the ES; this could amount to $250,000 per year in immediate rate increases to Nucor, even without considering any base rate cost shifts.

Q. How could the estimated cost shifts impact the typical residential end-user in the Owner Member systems?

A. The effects of the estimated cost shifts will differ for each Owner Member based on the unique customer classes, consumption patterns and load factors for each cooperative. However, in the worst case, given that the estimated increase on average for the Owner Members wholesale purchased power costs is 2.3%, and assuming that for most of the Owner Members, purchased power comprises approximately 70% of their total costs, then if each cooperative were to allocate that increase proportionally across the various rate classes, the average residential bill would increase by 1.6% with no corresponding benefit to the consumer.

Q. Based on South Kentucky's NPV calculation, what are the annual savings that South Kentucky estimates it will receive if the Commission approves the proposed PPA?

A. Based on the analysis sponsored by Mr. Babbit, South Kentucky will achieve [redacted] in savings in 2020,[39] compared to the $15.8 to $18.3 million annual cost increase that I estimate the remaining Owner-Members of EKPC would experience (using 2017 billing data) from the cost shift stemming from the Transaction.

[39] See Exhibit CB-10 workpapers provided in Response to DC1-30.

Q. What is your opinion about the reasonableness of the cost shift that stems from the Transaction?

A. In my view the cost shift resulting from the specific Transaction proposed by South Kentucky in this particular instance is unduly discriminatory because it is not related to the electric consumption patterns of any end-users or to any similarly-situated customers, but instead is related simply to which Owner-Member(s) file their Notice pursuant to Amendment No. 3 and the MOU first. For this reason I consider the cost shift to be unreasonable.

V. <u>RECOMMENDATION</u>

Q. What is your recommendation to the Commission in this matter?

A. As I described in my testimony herein, in my view the Transaction proposed by South Kentucky is unreasonable for several reasons.

<u>South Kentucky's evaluation of the costs and benefits of the Transaction is insufficient and flawed.</u>

- South Kentucky failed to properly consider the costs related to its proposed membership in PJM.
  - South Kentucky miscalculated the cost of Network Integration Transmission Service, understating the amount by approximately $600,000 for 2021 and for a total NPV reduction of approximately $9 million over the Transaction period.
  - South Kentucky miscalculated the cost of PJM Schedule 1-A for Transmission Owner Scheduling, System Control and Dispatch Service by

approximately $98,000 for 2021, and the miscalculation for the entire Transaction period results in a total NPV reduction of approximately $1.4 million over the Transaction period.

  - South Kentucky did not demonstrate that it properly included all of the applicable PJM charge types associated with its proposed membership in PJM.
  - South Kentucky did not rely upon a PJM capacity price forecast for the period applicable to the Transaction, which makes it impossible to assess the reasonableness of the capacity hedge proposed in the Transaction.
  - South Kentucky failed to adequately consider the long-term costs of membership in PJM, including the potential for substantial increases in the PJM Transmission Enhancement Cost Recovery charges in the future.
  - The Transaction does not permit South Kentucky to terminate the PPA due to increases in PJM costs.
  - South Kentucky does not have an agency agreement in place with EKPC and does not provide sufficient support for the estimated costs of such an agreement over the term of the Transaction.

- South Kentucky failed to demonstrate that the "significant savings" it expects to realize from the Transaction "far outweigh" the potential risks and in fact performed no in-depth analysis or quantifications of those risks.
- South Kentucky failed to perform robust sensitivity or scenario analyses around key variables to evaluate the economics of the Transaction under different modeling assumptions.

- South Kentucky failed to properly consider how potential changes in environmental laws can affect the Transaction.
- South Kentucky's claim that the Transaction provides the benefit of fuel diversity is unsupported because the Alternate Source is not tied to a specific generating unit or units within PJM.
- South Kentucky failed to properly consider how EKPC's rates will increase as a result of the PPA.
- South Kentucky incorrectly excluded fuel and ES costs from the South Kentucky estimated wholesale power costs, which means that the fundamental all-in costs in $/MWh compared in the NPV analysis are incorrect.
- South Kentucky did not use the currently-approved EKPC demand and energy charges in its NPV analyses.
- South Kentucky did not include the costs of obtaining a letter of credit.

<u>The Transaction imposes an unreasonable degree of risk upon South Kentucky.</u>

- The twenty-year term of the Transaction is unreasonably long for a purchased power agreement of this nature.
- The PJM market is very complex and dynamic, and thus poses significant uncertainty risk to South Kentucky over the twenty year term of the Transaction.
- The requisite PJM membership and the twenty year term collectively place risks on South Kentucky that exceed the risks that EKPC faces under the status quo arrangement.
- The Transaction does not sufficiently protect South Kentucky against failures on the part of Morgan Stanley to deliver energy as contracted under the PPA.

<u>The Transaction fails to address other legal and regulatory concerns.</u>

- South Kentucky has neither completed nor secured Commission approval of an agency agreement between it and EKPC for EKPC to act as market participant for South Kentucky in PJM – which raises numerous questions about which agency agreement outcomes qualify as a default under the PPA.
- South Kentucky makes no provision in the agreements for any exercise of jurisdiction by the Commission after its initial approval, which means that as far as South Kentucky is concerned, once the Commission approves this Transaction, the Commission has no further jurisdiction over it.

For these reasons, South Kentucky has failed to demonstrate that the Commission should find the Transaction to be fair, just and reasonable.

Additionally, the Transaction as proposed would result in a cost shift from South Kentucky to the other Owner-Members of EKPC in the range of $15.9 to $18.3 million annually. The cost shift in this instance is unduly discriminatory because it is not related to the electric consumption patterns of any end-users or to any similarly-situated customers but instead is related simply to which Owner-Member(s) file their Notice pursuant to Amendment No. 3 and the MOU first.

For the aforementioned reasons, I recommend that the Commission deny South Kentucky's Application in this matter.

Q. Does this conclude your testimony?

A. Yes, it does.

Verification

I, John Wolfram, hereby state and affirm that the foregoing testimony and attached exhibits were prepared by me or under my supervision, and all statements contained therein are true and correct to the best of my knowledge and belief, on this the 10 day of April, 2018.

John Wolfram

COMMONWEALTH OF KENTUCKY)

COUNTY OF JEFFERSON)

The foregoing verification statement was SUBSCRIBED AND SWORN to before me by John Wolfram on this the 10 day of April, 2018.

Notary Public, Ky., State at Large
My commission expires: 4-10-21

CONRAD NEWMAN
Notary Public
State at Large
Kentucky
My Commission Expires April 10, 2021