BEFORE THE PUBLIC SERVICE COMMISSION
OF THE COMMONWEALTH OF KENTUCKY

In the Matter of:

ELECTRONIC APPLICATION OF KENTUCKY UTILITIES COMPANY FOR AN ADJUSTMENT OF ITS ELECTRIC RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCREDIT	)))))))))	CASE NO. 2020-00349

In the Matter of:

ELECTRONIC APPLICATION OF LOUISVILLE GAS AND ELECTRIC COMPANY FOR AN ADJUSTMENT OF ITS ELECTRIC AND GAS RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCREDIT	)))))))))	CASE NO. 2020-00350

Supplemental Testimony of Justin R. Barnes
On Behalf of Kentucky Solar Industries Association, Inc.

July 13, 2021

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.

A. My name is Justin R. Barnes. My business address is 1155 Kildaire Farm Rd., Suite 202, Cary, North Carolina, 25711. My current position is Director of Research with EQ Research LLC.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING TESTIMONY?

A. I am submitting testimony on behalf of the Kentucky Solar Industries Association, Inc. ("KYSEIA").

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION ("COMMISSION")?

A. Yes. I submitted testimony in the earlier portion of these proceedings, and I submitted testimony to the Commission in Case No. 2020-00174 addressing the Kentucky Power Company's most recent general rate case application on aspects of the application addressing the proposed N.M.S. II tariff and rates for small power production facilities.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND OCCUPATIONAL BACKGROUND.

A. I obtained a Bachelor of Science in Geography from the University of Oklahoma in Norman in 2003 and a Master of Science in Environmental Policy from Michigan Technological University in 2006. I was employed at the North Carolina Solar Center at N.C. State University for more than five years as a Policy Analyst and Senior Policy

Analyst.[1] During that time I work on the *Database of State Incentives for Renewables and Efficiency ("DSIRE")* project, and several other projects related to state renewable energy and efficiency policy. I joined EQ Research in 2013 as a Senior Analyst and became Director of Research in 2015. In my current position, I coordinate and contribute to EQ Research's various research projects for clients, assist in the oversight of EQ Research's electric industry regulatory and general rate case tracking services, and perform customized research and analysis to fulfill client requests.

Q. PLEASE SUMMARIZE YOUR RELEVANT EXPERIENCE AS RELATES TO THIS PROCEEDING.

A. My professional career has been spent researching and analyzing numerous aspects of federal and state energy policy, spanning more than a decade. Throughout that time, I have reviewed and evaluated trends in regulatory policy, including trends in rate design and utility regulation. For example, as part of my current duties overseeing EQ Research's general rate case tracking service, I have reviewed dozens of general rate case applications, including the methods used by different utilities to develop cost of service studies and different rate designs, as well as the decisions made by regulators in those proceedings.

I have submitted testimony before utility regulatory commissions in Colorado, Hawaii, Georgia, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, South Carolina, Texas, and Utah, as well as to the City Council of New Orleans, on various issues related to distributed energy resource ("DER") policy, net metering, rate design, and

[1] The North Carolina Solar Center is now known at the North Carolina Clean Energy Technology Center.

cost of service.[2] These individual regulatory proceedings have involved a mix of general rate cases and other types of contested cases. My *curriculum vitae* was supplied with my prior testimonies in these proceedings and is already part of the record. It contains summaries of the subject matter I have addressed in each of these proceedings.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY.

A. My testimony addresses two aspects of the Kentucky Utilities Company ("KU" or "the Company") and Louisville Gas & Electric Company ("LGE" or "the Company) general rate case applications. I address the Companies' tariffs for net metering service under NMS-1 and NMS-2 and the export compensation rate for NMS-2 customers, and I address the Companies' tariffs for establishing purchase rates for energy and capacity from Qualifying Facilities ("QF") under Rider SQF for facilities of 100 kW or less and Rider LQF for facilities from 100 kW to 20 MW. I address both the changes that the Companies request to those tariffs in their applications as well as the existing structure of those tariffs as it pertains to the proper identification of avoided costs.

I addressed the Companies' tariffs for establishing purchase rates for energy and capacity under Rider SQF and Rider LQF in my prior testimony and responses to requests for information before this Commission and I adopt it for this phase of the proceedings. KYSEIA Witness Benjamin D. Inskeep addressed NMS-1 and NMS-2 in his prior testimony before this Commission. I am adopting Mr. Inskeep's prior testimony and responses to requests for information for this phase of the proceedings.

[2] The City Council of New Orleans regulates the rates and operations of Entergy New Orleans in a manner equivalent to state utility regulatory commissions.

Q. WHAT DID THE COMMISSION DECIDE IN ITS JUNE 30, 2021, ORDERS IN THESE PROCEEDINGS WITH RESPECT TO THE COMPANIES' PROPOSED NMS-2 EXPORT COMPENSATION RATES?

A. In both cases the Commission decided to defer decisions regarding Tariffs NMS-1 and NMS-2 to allow the Companies and the parties to present additional evidence. The Commission expressly found "that the existing record is insufficient to support a conclusion whether the proposed NMS-2 export compensation rate is fair, just and reasonable."[3] The Commission found that additional evidence and analysis is required. The Commission also found that the Companies' process for determining when an account should be closed and a new one created should be investigated.

Q. WHAT DID THE COMMISSION DECIDE IN ITS JUNE 30, 2021, ORDERS IN THESE PROCEEDINGS WITH RESPECT TO THE COMPANIES' COGENERATION AND SMALL POWER PRODUCTION QUALIFYING FACILITES?

A. In both cases the Commission concluded that the record is insufficient to support a finding that the proposed revisions to the SQF and LQF tariffs are fair, just and reasonable. The Commission decided to defer decisions regarding these tariffs to afford the parties the opportunity to develop a thorough, robust record.

II. NMS II EXPORT COMPENSATION RATES

[3] Order dated June 30, 2021, p. 37.

Q. HAVE YOU COMPLETED QUANTIFICATIONS OF THE VARIOUS COMPENSATION RATE COMPONENTS THAT THE COMMISSION CONSIDERS NECESSARY TO ADEQUATELY COMPENSATE THE COMPANIES' NMS-2 CUSTOMERS?

A. No. In Case No. 2020-00174, the Commission established eight (8) cost components for KPC's export rate, energy, ancillary services, generation capacity, transmission capacity, distribution capacity, carbon cost, environmental compliance cost, and job benefits. The Order in Case No. 2020-00174 was entered on May 14, 2021, which was after requests for information and the hearing in these cases. The components identified in Case No. 2020-00174 are not easily or quickly quantifiable for KU or LG&E based upon the existing record and available information. Also, the Commission did not quantify a jobs benefits component for KPC.

I agree in principle with the Commission's approach for Kentucky Power Company including the development of levelized rates that include discounting future cost avoidance balanced by the use of escalators on the cost side of the equation. I have conducted a preliminary analysis of the cost components based upon the existing record and available information. I will discuss the preliminary analysis and identify the types of evidence necessary for further analysis and quantification of seven (7) of the eight (8) components. I will not be able to quantify and recommend a jobs benefit cost component in these proceedings because the study that is necessary to evaluate that component has not been placed into the record and does not appear to be available. It is critical for the Companies

to supply sufficient evidence during the additional proceedings so that these quantifications can be performed.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF AVOIDED ENERGY COST SUGGEST?

A. The LG&E PJM interface appears to be the best fit. The same 3-year daytime-only (with escalation over time) methodology used for Kentucky Power Company should be used for the Companies. I acknowledge that this may not equate to the Companies' marginal costs of generation exactly, but interface pricing represents the value of substitute energy from either a purchase or sale standpoint. I also recommend that if and when the rates are updated the 2020 pricing not be included in the analysis because COVID-19 created pricing aberrations that are likely not representative of normal conditions. Accordingly, I do not think that 2020 pricing should be included in the calculation of energy pricing. To produce a three-year average the formula should use the most recent three years of pricing excluding 2020. At present this would correspond to the time period from 2017-2019.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF AVOIDED ANCILLARY SERVICES COST SUGGEST?

A. I agree that avoided ancillary services cost should be a component of the export rate and the cost should be forward-looking. Development of a quantification of this component requires additional discovery because there is not an equivalent market price referent to use in this case. Having said that, the PJM pricing used for the Kentucky Power Company could be used as a reasonable proxy for the Companies' avoided ancillary service costs as it represents a market-based measure for the cost of those services.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF AVOIDED GENERATION CAPACITY COST SUGGEST?

A. The Companies indicated in their most recent Integrated Resource Plan ("IRP") that the next capacity resource would be a natural gas combined cycle ("NGCC") station. I have not been able to locate an equivalent Net CONE for that particular potential addition from the IRP. However, I am aware that PJM establishes minimum offer prices for NGCC units for each annual auction, which provide a transparent measure of capacity cost and value. The Kentucky Power Company rate derivation uses a combustion turbine and the result is slightly different. While Case No. 2020-00174 is closed, I disagree with the value used for Net CONE for Kentucky Power Company. I disagree because the rates established for the Kentucky Power Company are actually based on the Minimum Offer Price, which is only 90 percent of Net CONE. In my view, the full Net CONE stated in terms of unforced capacity ("UCAP") is the appropriate number. My preliminary analysis also suggests that a representative effective capacity for solar can be developed using the Companies' LOLP study, but further discovery on this point *could* be used to perform a more robust evaluation.[4]

I recommend that the effective solar capacity determination be based on a representative solar production profile (e.g., using PVWatts) weighted according to hourly LOLP where hourly LOLPs are translated to a percentage of total LOLP over the entire

[4] For instance, LOLP patterns could vary based on the time horizon used in the evaluation and ELCC can be based on "marginal" ELCC for each new capacity increment, or a static ELCC applicable to the current state of the system. It is not clear whether such a more elaborate analysis would produce different results or whether such an evaluation can be performed with available data.

year.[5] Each hourly percentage is multiplied by the forecasted hourly solar capacity factor (kWh/kW) and the result is summed to create the LOLP weighted effective solar capacity. For instance, if a given hour is associated with 1% of the total sum of LOLP for a year, and modeled solar production during that hour produces a capacity factor of 50%, that 50% capacity factor is weighted at 1%. This calculation is completed for each hour of the year, and the sum of the weighted capacity factors over an entire year (8,760 hours) determines the effective solar capacity contribution. My preliminary analysis based on the Company's LOLP study incorporated into its cost of service study produces a solar ELCC of 58.14 percent of nameplate capacity.

The capacity rate should be calculated in the same manner as for Kentucky Power Company, in the form of a capacity value per kW divided by annual energy produced per kW. That rate must be grossed up for demand losses assuming that the facilities are connected at secondary voltage, which I assume at 5 percent. A preliminary calculation which is subject to revision based upon the results of discovery is a capacity rate of $0.0357/kWh. This is based on the PJM Net CONE for an NGCC for the 2020/2021 through 2022/2023 capacity auction years. Again, this is a preliminary calculation.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF AVOIDED TRANSMISSION CAPACITY COST SUGGEST?

[5] PVWatts production profiles do not include an adjustment for daylight savings time ("DST") which influences the capacity contribution in particular during summer late afternoon hours. A PVWatts profile must be shifted to one hour later in the day in March and shifted back to one hour earlier in November if the LOLP study states time in relation to prevailing time (i.e., the time on a clock incorporating DST).

A. The Companies use a cost allocation method for transmission that is highly unusual. I do not believe that solar output at the time of the maximum non-coincident class demand is the proper measure of solar's ability to avoid transmission costs. More commonly, transmission costs are allocated using the same allocator as production costs because both are incurred to serve load at the time of system peaks. In this case, the timing of peaks and value/cost of production capacity is measured in terms of LOLP. I recommend the use of an LOLP weighting to determine the effective solar capacity or in the alternative the use of a 6CP or 12 CP methodology. Again, my preliminary LOLP calculation produces a weighted solar capacity factor of 58.14 percent. A 6CP assessment produces an effective solar capacity factor of 35.92 percent.

Transmission costs may be calculated based on unit costs derived by dividing net demand-related cost of service by the associated class demand allocator for each Company in order to produce a $/kW amount. This unit cost amount is then multiplied by the effective solar capacity percentage, which de-rates the unit cost according to the solar contribution to peak. This solar unit value is then divided by modeled annual system production per kW to produce a $/kWh rate. This rate is grossed up for demand losses assuming that facilities are connected at secondary voltage, which I assume are at 5 percent. The resulting preliminary rates under an LOLP methodology are $0.01989/kWh for KU and $0.01037/kWh for LG&E. Under a 6CP methodology the rates are $0.00812/kWh for KU and $0.00782/kWh for LG&E.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF AVOIDED DISTRIBUTION CAPACITY COST SUGGEST?

A. I have not produced a preliminary analysis of this cost component, but I note that on a conceptual level, the unit cost-based methodology (with gross up for demand losses) that I identify for transmission costs can also be used for distribution costs. I recommend that the effective capacity contribution for the purposes of distribution costs be based on expected solar production during a rate class's highest load hours. For that purpose, I recommend that the calculation be made for hours where the class load is within 10% of the maximum hourly class load. For instance, if maximum class load during any hour was 2,000 MW, the calculation would use all hours where class load was greater than 1,800 MW.

Q. HOW DO YOU RECOMMEND THAT ESCALATION RATES BE ARRIVED AT?

A. For the distribution and transmission components I recommend that cost escalators be developed based on historic trends in demand-related transmission and distribution rate base. An annual average can be constructed by looking back to one or more previous rate cases and dividing the amounts of increases from rate case to rate case by the difference in timing of the associated test years. For example, a 15% increase in transmission plant in service relative a prior rate case corresponding to a 22-month difference in the test year would translate to an annualized increase of 8.18%. I suggest that the lookback period include at least two prior rate cases.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF AVOIDED CARBON COST AND AVOIDED ENVIRONMENTAL COMPLIANCE COST SUGGEST?

A. I attempted to develop specific recommendations on a per kWh dollar basis for carbon costs and environmental compliance costs. I reviewed the KU and LG&E IRP as part of my analysis. The CO2 rate calculated in Case No. 2020-00174 for KPC is based on

projected future CO2 emissions by KPC. I was unable to locate a similar projection in the Companies' IRP, which would be necessary to perform a similar calculation. I also note that the Companies' IRP uses a low projected future CO2 cost based upon a low carbon price scenario from a 2016 analysis.[6] In my view, the Companies' cost assumption in its IRP is outdated, understated, and should be revisited for the purpose of defining the NMS-2 rate.

The avoided environmental compliance cost rate is difficult to quantify without a detailed analysis that projects forward the environmental compliance costs for the Companies by year and separates them out into residential and non-residential segments. Further complicating the analysis is the fact that the current environmental cost factor varies by month and is a percentage of the bill for residential accounts rather than $/kWh amount. It would be reasonable for the Commission to utilize a levelized per kWh dollar amount.

Q. WHAT IS YOUR RECOMMENDATION FOR JOB BENEFITS AS A COMPONENT FOR THE COMPANIES' NET METERING EXPORT RATES.

A. The Companies' net metering export rates do not account for jobs or economic benefit even though behind the meter solar projects have been demonstrated as providing substantial and quantifiable job and economic impacts. In Case No. 2020-00174 the Commission observed that KPC's "net metering export rate did not account for the jobs or economic benefit provided by eligible customer-generators, including their maintenance and

[6] The Companies refer to this as the high CO2 Price scenario, but the values used are actually a low CO2 pricing scenario from the report they cite as the source.

installation."[7] The Commission also observed that it has previously considered "the economic benefit of rate proposals, including their ability to induce incremental job impacts."[8] The Commission directed KPC "to evaluate job benefits and economic development as an export rate component for Kentucky Power's next rate case filing."[9] There is no valid reason for the Companies to ignore the substantial and quantifiable job and economic impacts when determining their net metering export rates. The Commission should likewise require the Companies to evaluate job benefits and economic development as an export rate component for their next rate case filings. The evaluation should be forward-looking and calculate benefits on a per kWh basis.

Q. WHY SHOULD THE DEVELOPMENT OF A JOB BENEFITS COMPONENT BE DELAYED AND NOT ESTABLISHED IN THESE CASES?

A. Job Benefits should be a component of an export rate, but the evidence in these cases is insufficient to quantify a value. The Companies approached the development of net metering export rates through a very narrow focus and failed to conduct sufficient research in several areas including job benefits. In Case No. 2020-00174 the Commission recognized that there are "unique economic circumstances in Kentucky Power's service territory."[10] Likewise, the economic circumstances in the service territories of KU and LG&E are also unique and have not yet been studied.

[7] Order dated June 30, 2021, pp. 37 and 38.
[8] Id.
[9] *Id*.
[10] Id.

At the present, since the Job Benefits component cannot be reliably quantified, I recommend that the Commission consider Job Benefits as a qualitative factor in its decision-making. Such an approach would be similar to how generally accepted principles of ratemaking that defy easy quantification (e.g., gradualism, understandability to customers) are considered in the ratemaking process. I emphasize that simply because a given benefit category is difficult to quantify is not sufficient reason for it to be ignored or otherwise assigned a null value.

With respect to future proceedings, I recommend that the Commission direct the Companies to conduct an evaluation of Job Benefits of customer-sited solar for review in their next rate cases. That evaluation should consistent with the methodology employed in the value of solar study produced for the Maryland Public Service Commission as referenced in the Direct Testimony of KYSEIA Witness Benjamin D. Inskeep.

Q. DO YOU HAVE ANY RECOMMENDATIONS CONCERNING THE NETTING PERIOD?

A. Yes. The Commission should adopt the monthly netting regime that it adopted for Kentucky Power Company. Net metering tariffs among the various utilities should share as much common ground as possible and this is one aspect that can be rendered common without creating complications from a ratemaking standpoint. Real-time export rates can make predicting customer savings close to impossible. An all export rate would significantly increase the complexity of the NMS-2 rate design relative to a monthly netting regime.

Q. DO YOU HAVE ANY COMMENTS CONCERNING TRANSFERRING, CLOSING, OR CREATING A NEW ACCOUNT?

A. The Commission's June 30, 2021, Order observes that if only one spouse's name is listed on the account and the couple divorces, or if the spouse whose name is the only name on the account passes away, a spouse whose name is not on the account and who stays in the house must create a new account.[11] The existing account is closed and for a premise that is served under NMS-1 or NMS-2, any accumulated credits would not be transferable or eligible for a cash refund upon the closing of the account.

The Commission is justified in its concerns regarding the fairness of such a process, and it is plausible that other circumstances could arise with respect to account administration procedures that elicit similar concerns (e.g., a transition from one renter to another with no gap in service). For that reason, I urge the Commission to establish a general policy that accumulated credits may run with the premises on which they were generated. Furthermore, any account that has previously been enrolled in net metering should be automatically enrolled in net metering when a new customer takes service at the same service address without requiring a new interconnection or net metering application.[12]

III. SQF and LQF TARIFFS

[11] Order dated June 30, 2021, p. 44.

[12] This recommendation stems my personal knowledge of an instance where a home on which a net-metered solar facility was installed was disenrolled in net metering upon the creation of a new electric account for a renter at the same address. As a consequence, the new electric account was not provided with net metering credits for a period of time after the transfer despite the fact that it was eligible for net metering.

Q. WHAT DOES YOUR PRELIMINARY ANALYSIS OF COGENERATION AND SMALL POWER PRODUCTION QUALIFYING FACILITES SUGGEST?

A. I understand that the Commission has extended the proceedings to allow for the development of a thorough and robust record on the Companies proposed revisions. My opinion remains that the Companies' proposed SQF and LQF tariffs are not fair, just and reasonable. In my prior testimony I made a number of recommendations concerning the Companies' proposed SQF and LQF tariffs, and I continue to support these recommendations. Most critically, the Companies SQF and LQF tariffs fail to account for their true long-term costs of capacity and the added line loss costs that transmission connected centralized generation incurs due to the physical reality of the electricity delivery system.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

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AFFIDAVIT OF JUSTIN BARNES
VERIFICATION

JURISDICTION)
)
County of Wise, Virginia)

The undersigned, Justin Barnes, being first duly sworn, states the following: The prepared Testimony attached thereto constitute the testimony of Affiant in the above-styled cases. Affiant states that he would give the answers set forth in the 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.

Name of Witness

SABRINA STEWART MULLINS
NOTARY PUBLIC
REG. #7100596
MY COMMISSION EXPIRES
5/31/2023
COMMONWEALTH OF VIRGINIA

SUBSCRIBED AND SWORN to before me on this 13th day of July 2021. by Justin R Barnes

NOTARY PUBLIC

My Commission Expires: 5/31/2023