COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

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 SUR-CREDIT	)	**Case No. 2020-00349**

AND

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 SUR-CREDIT	)	**Case No. 2020-00350**

SUPPLEMENTAL DIRECT TESTIMONY OF JAMES OWEN ON BEHALF OF JOINT INTERVENORS

Tom FitzGerald
Kentucky Resources Council, Inc.
P.O. Box 1070
Frankfort, KY 40602
(502) 551-3675
FitzKRC@aol.com
Counsel for Joint Intervenors Kentucky Solar Energy Society, Kentuckians For The Commonwealth, Mountain Association (Case No. 2020-00349), and Metropolitan Housing Coalition (Case No. 2020-00350)

July 13, 2021

I. Introduction and Overview

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

A: James Owen, Executive Director, Renew Missouri Advocates d/b/a Renew Missouri ("Renew Missouri"), 409 Vandiver Dr. Building 5, Suite 205, Columbia, MO 65202.

Q: Are you the same James Owen who previously offered testimony in this case?

A: Yes.

Q: What is the purpose of your testimony?

A: My testimony will outline key principles regarding evaluating the value of solar provided by customers to the Company in order to guide the Commission in setting a fair, just and reasonable compensation rate. The Commission's recent Order noted that "the record is insufficient to support a finding that the NMS-2 export compensation rate is fair, just and reasonable, the Commission finds that a decision regarding NMS-1 and NMS-2 should be deferred to afford the parties the opportunity to develop a thorough, robust record with sufficient evidence to support a finding that KU's proposed Tariff NMS-2 rates are fair, just and reasonable." The Commission also reiterated that the burden of proof on a net metering successor rate falls on the applicant but invited other parties to add to the record. While I did not offer testimony regarding the NMS tariff sheets in this case, I previously provided testimony related to net-metering in Kentucky Power Company's rate case where the Commission recently approved a successor rate.

Q: What do you recommend to the Commission in this case?

A: Under Senate Bill 100 ("the Net Metering Act"), the Commission has significant authority to ensure that customers have an opportunity to install solar on their own properties and to be compensated fairly for the energy they provide to the grid. The Commission should

refrain from approving changes to NMS tariffs until there has been thorough Cost-Benefit Analysis that accounts for all of the benefits that net metering provides to the grid and to the utility.

II. Best practices to determine value of solar

Q: Why is a Cost-Benefit Analysis important before the Commission sets compensation rates for solar?

A: There has been a nationwide push on the part of electric utilities to diminish the growth of customer-owned and customer-sited distributed generation, specifically with photovoltaic ("PV") solar energy systems. This effort is based on the mistaken claim that customers with distributed generation are being unfairly subsidized by all other ratepayers because they are paying less of their fair share of "fixed costs." In fact, an appropriately conducted Cost-Benefit study may in fact show that solar customers provide benefits that subsidize the utility and other ratepayers. I will explain these competing arguments around cross-subsidization in my discussion of "the Value of Solar" below. I commend the Public Service Commission for continuing to take steps to ensure customers receive fair treatment and compensatory credit for the energy they produce. Further, I provide this testimony to highlight some other studies where the Commission can look to for "best-practices."

Q: Do you believe the Company is entitled to its proposed changes in order to serve the statutory goal of reducing intra-class subsidies?

A: No. The Net Metering Act, which went into effect on January 1, 2020, clearly provides the Company with the right "to implement rates to recover from its eligible customer-generators all costs necessary to serve its eligible customer-generators, including but not limited to fixed and demand-based costs, without regard for the rate structure for

customers who are not eligible customer-generators."[1] However, the statute also grants the Commission broad authority to determine the rate at which to compensate customer-generators for their generation, or what the statute refers to as a "dollar-denominated bill credit."[2] Thus, it is in the Commission's discretion to determine what rate will provide the Company with all of its fixed and demand-based costs. In setting this rate in this case and all other related cases, the Commission should ensure it is accounting for all costs and benefits associated with customer-owned solar energy systems.

Additionally, the Commission should hold utilities to their full burden of proof and require them to produce substantial evidence for all of the costs and benefits that each solar system contributes to the utility's system. The Company should be required to assess the system-wide benefits or savings experienced due to solar, which include: reduced transmission and distribution losses; reduced congestion at stressed nodes and distribution points along the grid; peak load reductions or shifts; reduced costs along the fuel supply line; reduced environmental liabilities and/or environmental compliance costs; avoided generation capacity investments; reduced grid support services; improved grid resiliency; and others. These savings and benefits extend beyond the simple "cost of electric service" to the particular customer-generator. It is my opinion that the Company has not met its burden of proving that its proposed rate is an equitable figure for compensating customer generators.

Q: How should the Commission consider costs and benefits when setting the compensation rate?

[1] KRS 278.465.2(5)
[2] KRS 278.465.2(4)

A: I recommend that the Commission require a comprehensive Cost-Benefit Analysis to study all the costs and benefits of distributed solar on Kentucky's electric grid. At a minimum, the Analysis should consider all financial costs and benefits that occur systemwide as a result of integrating distributed generation onto the grid, backed by significant and thorough data. In addition, the Commission should carefully consider whether cost impacts outside of utilities' cost of electric service should be factored in as a matter of public policy (e.g. the value of local job creation, customer autonomy, reduced environmental impacts, etc.). The Commission should refrain from approving any utility's proposed compensation rate until such a Cost-Benefit Analysis is conducted with full opportunity for review and input by stakeholders. The Commission's decision to require additional testimony here is a beneficial part of that process, but I caution that the fact that the utility holds all of the information needed to complete a robust analysis within the allocated timeframe is an additional challenge especially if the process to gain information is an adversarial endeavor.

Q: How have other states approached the issue of assessing the costs and benefits of distributed solar for purposes of customer-generator compensation?

A: The concept of the Value of Solar has been a topic of conversation in the United States for more than a decade. Many states have taken it upon themselves to solicit and conduct studies of all the costs and benefits of integrating distributed solar onto the grid. More often than not, these studies conclude that solar provides a net benefit to a utility's system, more than making up for the added costs to the grid or the reduced fixed costs paid by each customer-generator. These studies have led experts to conclude that the economic benefits of net metering actually outweigh the costs and impose no significant cost increase for non-

solar customers. This conclusion obviously flies in the face of the common utility argument that solar customers receive a cross subsidy from non-solar ratepayers.

Many states have conducted Value of Solar studies of one form or another. States that have existing studies include: Arizona (2016 and 2013); Arkansas (2017); California (2016, 2013, 2012, 2011, 2010, 2005); Colorado (2013); Florida (2005); Hawaii (2014); Iowa (2016); Louisiana (2015); Massachusetts (2015); Maine (2015); Mississippi (2013); North Carolina (2014); Nevada (2017, 2014); New Jersey and Pennsylvania (2012); New York (2012 and 2008); South Carolina (2015); Texas (2014), including for the cities of San Antonio (2013) and Austin (2006); Utah (2014); Vermont (2014); Virginia (2014); and Wisconsin (2016).[3] Other states have conducted dockets and processes for establishing a Value of Solar methodology or framework, such as: Minnesota (2014); Rhode Island (2015); and New York (2016). In addition to state studies, several cities and utilities have conducted their own and the majority of studies arrive at a value for solar kWhs that is higher than the average retail rate for electricity in the jurisdiction.

The party conducting the study seems to matter as well. Studies conducted by utilities typically find a lower value for solar, although usually still more than the retail cost of electricity. In 2016, Frontier Group and Environment America's Research and Policy Center published a meta-analysis of sixteen value-of-solar studies, and found that studies that left out societal benefits valued solar, on average, at 14.3 cents per kilowatt-hour, compared to 22.9 cents for those studies that at least accounted for greenhouse gas emissions.[4]

[3] Solar Energy Industries Association, "Solar Cost-Benefit Studies," Available at: https://www.seia.org/initiatives/solar-cost-benefit-studies

[4] Gideon Weissman and Bret Fanshaw, "Shining Rewards: The Value of Rooftop Solar Power for Consumers and Society." October 2016, Frontier Group and Environment America Research and Policy Center. Available at:

There are numerous resources to aid regulators in determining how to design a Value of Solar study. I recommend a resource from the National Renewable Energy Laboratories (NREL), which has published a program design guide for regulators that includes considerations for conducting a study and implementing its findings.[5] I also recommend the methodology and resources contained in the previously filed testimony of Karl Rábgao including the Hayibo and Pearce, Review of the Value of Solar Methodology with a Case Study of the U.S. VOS.[6]

Q: What does the Commission need to do to appropriately value solar customer's energy contributions?

A: As I mentioned above, the electric utility has greater visibility and access to much of the required data and information to determine a fair and reasonable compensation rate. An important step in determining the rate is to order the company to provide its own figures for the inputs the Commission wishes to be considered that interested parties are able to review and offer suggested modifications. Based on the Commission's Order as I understand it, concurrent with this testimony the utility is required to submit supplemental testimony related to avoided energy cost, ancillary services cost, generation capacity cost, transmission capacity cost, distribution capacity cost, carbon cost, environmental compliance cost, job benefits. These components would follow the Commission's Order in the Kentucky Power Company case. If the Company does not provide that information, the

https://environmentamerica.org/sites/environment/files/reports/AME%20ShiningRewards%20Rpt%20Oct16%201.1.pdf

[5] Mike Taylor, Joyce McLaren, Karlynn Cory, Ted Davidovich, John Sterling, Miriam Makhyoun, "Value of Solar: Program Design and Implementation Considerations." The National Renewable Energy Laboratories, March 2015. Available at: https://www.nrel.gov/docs/fy15osti/62361.pdf . See also *National Standard Practice Manual For Benefit-Cost Analysis of Distributed Energy Resources AUGUST 2020.* *www.nationalenergyscreeningproject.org/national-standard-practice-manual/*

[6] Hayibo, K.S. and Pearce, J.M., *A Review of the Value of Solar Methodology with a Case Study of the U.S. VOS,* Renewable and Sustainable Energy Reviews 137 (2021).

Commission should order it to produce that analysis. Once the parties have that specific data the stakeholders will be able to test and benchmark those figures against others in the industry – including the recent Kentucky Power rates – to evaluate the reasonableness of any compensation rate.

Additionally, in holding the company to its burden of proof I recommend the Commission require the company to produce evidence for the costs and benefits of solar, including: reduced transmission and distribution losses; reduced congestion at stressed nodes and distribution points along the grid; peak load reductions or shifts; reduced costs along the fuel supply line; reduced grid support services; and improved grid resiliency.

Q. Regarding the avoided cost of carbon emissions, do you recommend any changes from how this component was treated in the Kentucky Power Company case?

A. Yes. The cost of carbon should be updated from the pricing used in the Kentucky Power case, to correspond to the most up-to-date science and federal policy. A detailed discussion of the social cost of carbon can be found in a recent report from the United States Government's Interagency Working Group ("IWG") on Social Cost of Greenhouse Gases, *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates underExecutiveOrder13990(February2021).*[7]

The document from the IWG explains the need to consider a range of discount rates when considering the social cost of carbon and other greenhouse gases. As stated in the *Technical Support Document*, "The three discount rates selected by the IWG in 2010 are centered around the 3 percent estimate of the consumption interest rate published in OMB's

[7] Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990, February 2021.* Available at: https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

Circular A-4 in 2003. That guidance was based on the real rate of return on 10-year Treasury Securities from the prior 30 years (1973 through 2002), which averaged 3.1 percent. Over the past four decades there has been a substantial and persistent decline in real interest rates..."[8] Table 1 shows the Social Cost of CO2 from 2020 – 2050, under three discount rates.[9]

Table 1: Social Cost of CO_2, 2020 – 2050 (in 2020 dollars per metric ton of CO_2)[31]

	Discount Rate and Statistic			
Emissions Year	5% Average	3% Average	2.5% Average	3% 95th Percentile
2020	14	51	76	152
2025	17	56	83	169
2030	19	62	89	187
2035	22	67	96	206
2040	25	73	103	225
2045	28	79	110	242
2050	32	85	116	260

Based on the guidance in the IWG document, I therefore recommend that the 3 percent discount rate be used for estimating the cost of carbon in the net metering analysis. (Note, this would also be consistent with the environmental discount rate used in the Minnesota Value of Solar Methodology.)[10]

Using the 3 percent discount rate would lead to a price on carbon starting at $51 in 2021. Note that such pricing is realistic in the global energy market. In the European Union Emissions Trading System, the carbon price was $49.78 as of July 12, 2021.[11]

[8] Ibid, p.19.
[9] Ibid, p. 24 for Table 1 that is included here.
[10] Minnesota Department of Commerce, Division of Energy Resources, *Minnesota Value of Solar: Methodology*, April 1, 2014, p. 21. See https://mn.gov/commerce-stat/pdfs/vos-methodology.pdf.
[11] https://carbonpricingdashboard.worldbank.org/map_data

Q: Do you have other recommendations concerning the calculation of the avoided cost of carbon?

A: Yes. In the NEM Analysis performed by the Commission in the Kentucky Power Company case, in the "Carbon IRP" tab, a discount rate of 7 percent is used. As discussed in the previous section, a 3 percent discount rate is more appropriate when determining the avoided cost of carbon. This is consistent with the recommendation provided by Hayibo and Pearce,[12] which specifically used the environmental discount rate provided in the IWG's Social Cost of Carbon report, and in the Minnesota VOS Methodology.[13]

Q: If the companies are not able or willing to produce the data needed to determine the full range of costs and benefits in this case, what should the Commission do if it wants to set a compensation rate other than 1:1 net-metering?

A: In the absence of the company producing a thorough cost benefit analysis, and understanding that the Commission may believe it is necessary to establish a value to replace the 1:1 kWh netting, the Commission should follow the suggestions in the supplemental testimony of Karl Rábago that the Commission utilize default values and range of values contained in the Hayibo and Pearce study.[14]

Q: Does this conclude your testimony?

A: Yes.

[12] Hayibo, K.S. and Pearce, J.M., *A Review of the Value of Solar Methodology with a Case Study of the U.S. VOS*, Renewable and Sustainable Energy Reviews 137 (2021) 110599, p.4.
[13] Minnesota Department of Commerce, p.21.
[14] Hayibo, K.S. and Pearce, J.M., *A Review of the Value of Solar Methodology with a Case Study of the U.S. VOS*, Renewable and Sustainable Energy Reviews 137 (2021).

VERIFICATION

The undersigned, James Owen, bring first duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony and that the information contained therein is true and correct to the best of her information, knowledge, and belief, after reasonable inquiry.

James Owen

Subscribed and sworn to before me by James Owen this 13th day of July, 2021.

Notary Public

My commission expires Feb 27, 2024

CLYDE E. McCLAIN
Notary Public – Notary Seal
STATE OF MISSOURI
Greene County
My Commission Expires Feb. 27, 2025
Commission #17301881