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Issues:	Solar subscription program, Customer access to bill data
Witness:	Philip Fracica
Sponsoring Party:	Renew Missouri Advocates
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Case Nos.:	ER-2018-0145/ER-2018-0146
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MISSOURI PUBLIC SERVICE COMMISSION

ER-2018-0145 / ER-2018-0146

REBUTTAL TESTIMONY

OF

PHILIP FRACICA

ON BEHALF OF

RENEW MISSOURI ADVOCATES

July 27, 2018

Renew MO Exhibit No. 404
Date 9-25-18 Reporter TC
File No. ER-2018-0145 & 0146

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service	))))	File No. ER-2018-0145
In the Matter of KCP&L Greater Missouri Operations Company's Request for Authority To Implement a General Rate Increase for Electric Service	))))	File No. ER-2018-0146

AFFIDAVIT OF PHILIP FRACICA

STATE OF MISSOURI)
) **ss**
COUNTY OF BOONE)

COMES NOW Philip Fracica, and on his oath states that he is of sound mind and lawful age; that he prepared the attached rebuttal testimony; and that the same is true and correct to the best of his knowledge and belief.

Further the Affiant sayeth not.

Philip Fracica

Subscribed and sworn before me this 27th day of July 2018.

Notary Public

MATTHEW PATTERSON
Notary Public, Notary Seal
State of Missouri
Boone County
Commission # 11274306
My Commission Expires 01-19-2020

My commission expires: 1-19-20

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REBUTTAL TESTIMONY OF PHILIP A. FRACICA

Case No. ER-2018-0145/0146

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Philip A. Fracica. My business address is 409 Vandiver Drive Building 5 Suite 205, Columbia, Missouri, 65202.

Q. By whom and in what capacity are you employed?

A. I am employed by Renew Missouri Advocates (DBA Renew Missouri) as a Policy Organizer.

Q. Are you the same Philip Fracica who filed direct testimony in this case?

A. Yes.

Q. What is the purpose of your rebuttal testimony in this proceeding?

The purpose of my rebuttal testimony in this proceeding is to respond to KCPL's and GMO's Proposed Solar Subscription Tariffs to encourage the companies to reassess the price of their solar subscription project through an RFP process and based on existing or upcoming utility solar subscription programs in Missouri. I also address that the Companies proposal would be improved with the addition of a low-income component. Lastly, I am commenting support of the Office of Public Counsel's "Green Button" testimony and for the use of the company's CIS upgrades to implement a similar program for customers.

II. Solar Subscription Pilot Tariff Concerns

Q. Please describe your concerns with the Solar Subscription Pilot as proposed by the Companies.

A. While I applaud the Companies' interest in putting forward a project aimed at pursuing renewable resources and providing customers the opportunity to participate, there are a few areas where the proposal can be improved. First, the companies should include a low-income component to the subscription project. I described in my direct testimony that a low-income component will allow customers to access the benefits of solar energy who may otherwise be unable to participate.

The second concern I have relates to the companies' solar subscription price, which I believe to be inappropriately high compared to existing or upcoming solar projects in Missouri. Ultimately, the subscription price should be based on the results from a competitive and open RFP process to ensure customers are realizing the greatest benefit possible.

Q. Why should KCPL and GMO incorporate a low-income component to the solar subscription program?

A. Various program design models that have been adopted in other states offer a low-income component to subscription programs and the companies should consider these in their own program. I outlined several options in my direct testimony including using other funding sources to "buy-down" any premiums and exempting qualifying customers from additional charges. Based on the actions in Docket No. EW-2019-0002 relating to solar rebates, I also believe the Commission has an interest in helping Missourians get access to renewable energy in an equitable way. In that docket, the Commission staff's draft rule attempts to target solar rebates to help low-income communities, multifamily

dwellings, and high poverty areas gain access to solar. Renew Missouri supports and actively works on helping these aforementioned communities gain access to clean energy programs to lower their energy burden but, importantly, I believe low-income community solar offerings are a more readily available option and are much easier for customers to navigate.

A low-income component in a community solar project offers access to customers while avoiding certain practical barriers that prevent low-income customers from enjoying the benefits of a solar rebate. These barriers include lack of property ownership, underlying safety issues with the property, capital restrictions, or inability to access financing, and an energy inefficient low-income multifamily housing stock. Given the complexities surrounding these different barriers, a solar subscriber program with a low-income component is much more likely to expand access to renewable energy in a manner that allows low-income customers to participate. KCPL and GMO have an opportunity in these rate cases to pursue this kind of program and set the pace for the other IOUs in the state to follow.

Q. Your second criticism relates to the companies' solar subscription price. Why do you believe the price to be inappropriately high?

A. Compared to existing or upcoming solar projects, the KCPL and GMO solar subscription rates are higher than we had hoped. Due to the size of the project, location, and solar industry improvements that have occurred since other Missouri utilities already constructed solar systems for a lower premium solar price I am skeptical of the pricing proposed by KCPL and GMO.

Q. How does KCPL and GMO's Solar Subscription Pilot Tariff pricing compare to Boone Electric Cooperative's and Independence Power & Light's Solar Subscription Programs?

A. Boone Electric Cooperative based out of Columbia, Missouri, has been operating its Community Solar Project since August 2016. The project is 100 kW and consists of 400 320-watt panels. The program allows for members to subscribe per panel and a kWh from the facility costs 15.95¢. This is slightly higher than the current kWh price, it results in a $1.54-$3.35 per panel premium monthly charge or $2.65 on average. While this model is different than the one proposed by KCPL and GMO, the premium charge is comparable to KCP&L's proposed premium of 15.9¢. Notably, Boone's system is 98% smaller than KCPL's and GMO's proposed system. The project size is significant because as project size increases, the price per MWh decreases due to economies of scale. A study done by the Brattle Group in 2015 identified the economies of scale of utility-scale solar and found that "The projected levelized cost of energy from utility-scale PV in 2019 ranges from $66/MWh to $117/MWh (6.6¢/kWh to 11.7¢/kWh) across the scenarios considered, while residential-scale PV energy costs $123/MWh to $193/MWh (12.3¢/kWh to 19.3¢/kWh) for a typical residential-scale system owned by the customer."[1]

[1]Tsuchida, Bruce, et al. "Comparative Generation Costs of Utility-Scale and Residential-Scale PV in Xcel Energy Colorado's Service Area." *Www.brattle.com*, The Battle Group, July 2015, Page 7,files.brattle.com/system/publications/pdfs/000/005/188/original/comparative_generation_costs_of_utility-scale_and_residential-scale_pv_in_xcel_energy_colorado's_service_area.pdf?1436797265.

The study looked at utility-scale solar as anything beyond 5 MW and would apply to the companies considered scale for this tariff. As you can see above, there is a significant cost benefit to utility-scale solar as opposed too residential solar. In comparing the economies of scale to Boone Electric's solar program and the companies' proposed program, they should not have an almost identical premium when there is a significant difference in scale between these projects.

Separately, Independence Power & Light (IPL) currently has 14.7 MW of solar available via its community solar program. This program is unique due to the inclusion of both residential and C&I customer classes in one program. For C&I customers, IPL is limiting individual customers subscription to 33% of the solar capacity of the total program. All customers are limited to 40% of their average monthly energy usage, as determined by IPL. For each kW registered, the customer will receive, on average, 144 kWh in solar output. Currently, customers are charged an additional fixed fee of $2.37 per monthly billing cycle per subscribed kW. This may change in the future to a price of 1.65 cents/kWh for solar energy (which is equivalent to $2.37 per kW subscribed) and customers are guaranteed that their annual cost to participate will not increase in the future. IP&L customers receive the energy output from subscribed panels and the energy output is offset on the customers' bill as a way of virtual net metering. IP&L customers will see a $2.37 per block bill charge or a 1.65 cents/kWh charge in the future. Compared to KCP&L & GMO's premium average of 1.997-7.17 cents/kWh, there is a large difference.

Q. How does Ameren Missouri's Solar Subscription Tariff compare to KCPL's and GMO's Solar Subscription Pilot?

A. Ameren Missouri's program has a few key differences to the KCPL and GMO program related to the pricing difference between the two programs. Ameren Missouri's proposed program is a 1 MW or 1000 kW solar system. The program's initial fee will cost $25 per 100 kWh-subscribed blocks. Similar to KCPL's and GMO's program, subscribers cannot exceed 50% of their annual energy usage. For residential customers it will cost $13.95 per 100 kWh and small general service customers will be charged $13.09 per 100 kWh, under Ameren Missouri's program. One key component to keep in mind is the difference in electric rates between the utilities. KCPL and GMO generally have higher rates per kWh compared to Ameren Missouri ranging from $.0031 to $.348 between both residential and small general service rate classes.

Additionally, KCPL's and GMO's program does not have a fee per subscribed block like Ameren Missouri's proposed solar program. Ameren Missouri is requiring a $25 fee per block that can help reduce the payback period for participants by paying down some of the initial project costs via the one-time fee. It could be worthwhile for KCPL and GMO to evaluate charging this kind of a fee to help reduce the carrying charge needed to finance the shortfall between the LCOE and discounted annual revenue requirements. If KCPL and GMO were able to charge $25 (or more) per block at approximately 10,000 blocks, the company could recover most or all of the costs that would be covered with the proposed adder that is built into KCPL and GMO's LCOE calculations, found in

response to staff's DR No. 0220. Based on the companies' solar revenue requirement model, the adder would allow for KCPL to recover $267,927. Comparatively, if the company charged a $25/block initial fee to participants for at least 10,000 blocks (as Ameren plans to), the company would receive $250,000 from the outset. This could then bring down the company's calculated LCOE to without the adder to $.116 per kWh, which in turn would lower the Solar Subscription Premium down to $.154 per kWh. With that said, I believe that the company should consider allowing subscribing customers the option to pay an initial up-front fee in place of the adder fee included with the companies calculated LCOE to receive a lower premium.

If no change is made to KCPL's proposal, for the summer months, KCPL and GMO solar subscribers would be paying an average premium of 1.997 cents per kWh, per block and 3.85 cents per kWh, per block, respectively. For the same period, Ameren Missouri solar subscribers would pay an average premium of 1.37 cents per kWh. For the winter months, KCPL and GMO have a slightly higher average premium at 7.17 cents and 7.15 cents per kWh while Ameren's average premium was 6.575 cents per kWh. You can review my comparative analysis of the difference of Ameren, KCPL, and GMO's residential rates from the premium solar subscription rate below at Figure 1. The seasonal low and high values were included for your reference.

Figure 1: Utility Residential Rate and Solar Premium Rate Difference Comparison

Utility Solar Price (all values in cents/kWh)		Summer Rate Average Difference	Winter Rate Average Difference	Summer Low	Summer High	Winter Low	Winter High
KCPL	15.9	1.997	7.17	0.984	3.01	3.669	9.339
GMO	15.9	3.85	7.1583	3.85	3.85	5.275	8.1
Ameren	13.95	1.37	6.575	1.37	1.37	5.2	7.95

KCPL and GMO should consider lowering their premium to be at an equivalent rate or at a comparatively lower rate to Ameren's premium charge. When one includes the additional factors highlighted further on in this testimony, the relative premiums for KCPL and GMO should be concerning.

Q. What does comparing the KCPL and GMO proposal to similar programs offered by other utilities in the state reveal?

A. KCPL and GMO's gross subscriber rate as well as the net premium embedded in that rate, as proposed, will be higher than other prices and premiums for similar programs across the state. Importantly, there are some key differences between these projects that should make KCPL's and GMO's project more cost competitive than those other projects rather than less.

One advantage that KCPL and GMO have over Ameren Missouri is the benefit of a better solar resource profile as illustrated in NREL's Solar Resource Map of Missouri below in Figure 2.

Figure 2: NREL Solar Resource Map of Missouri[2]

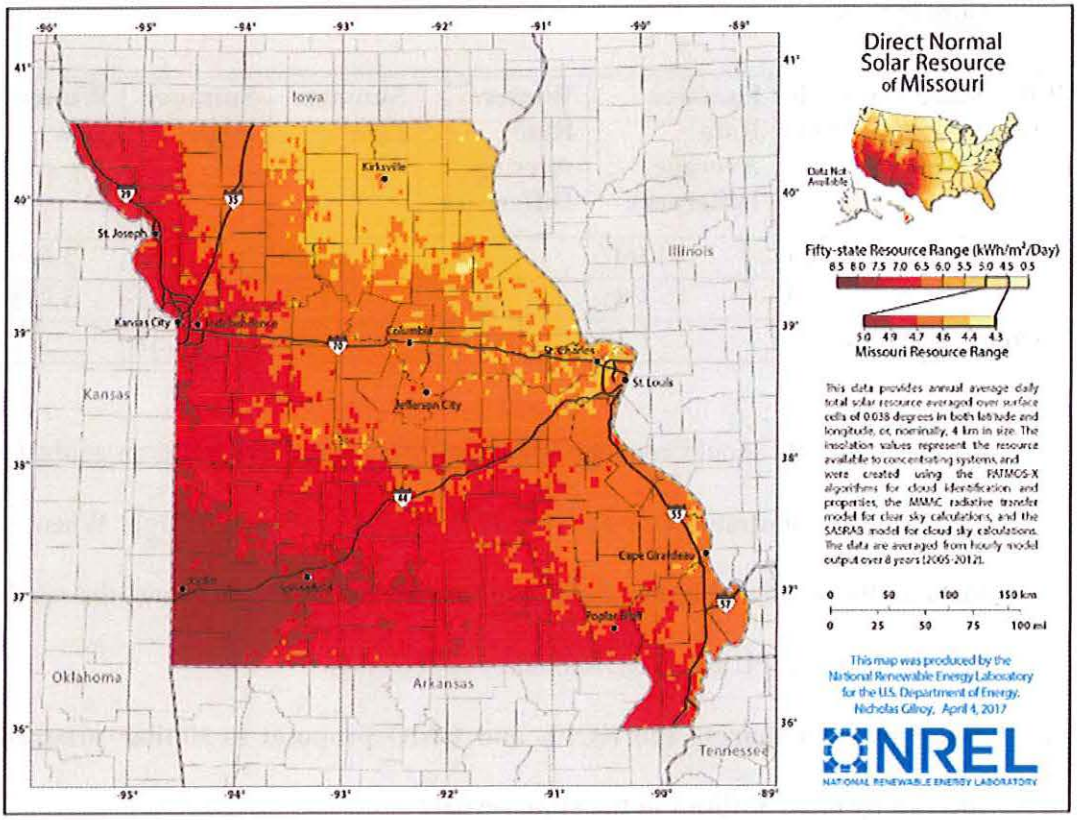

Figure 2 shows the solar resource range for the state of Missouri. This map shows that the solar insolation is higher in the western part of the state as compared to the eastern part of the state, meaning that KCPL and GMO will have a higher solar production or kWh output when compared to Ameren Missouri's system.

Another advantage that KCPL and GMO should have is the size, or scale, of the project. Based on trends in utility-scale solar prices and from recent

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[2] Gilroy, Nicholas. "NREL Solar Maps." *Research Team Engineers a Better Plastic-Degrading Enzyme | News | NREL*, National Renewable Energy Laboratory , 4 Apr. 2017, www.nrel.gov/gis/solar.html.

Purchase Power Agreements ("PPAs") prices for solar, the Commission should expect the proposed project to be even more cost competitive.

Q. What are the benefits from utility-scale solar as shown by recent Power Purchase Agreements?

A. Building solar systems at scale provides a cost benefit and utility-scale solar is at an even lower price than residential community solar. In NREL's Solar PV System Benchmark report for Q1 2017, they found that fixed-tilt utility-scale systems cost $1.34/Wac and $1.44/Wac for on-axis tracking utility-scale systems when looking at systems larger than 2 MW. This trend is expected to continue this year as NREL addressed in their report "[o]verall, modeled PV installed costs declined, year over year, in Q1 2017 for all three sectors, as they have done each year since we began modeling PV system costs."[3] While this NREL report is from a research perspective, real market data on utility-scale solar systems through PPAs can offer additional support. The Rocky Mountain Institute (RMI) summarized some data from recent projects in New Mexico and Colorado to provide a comparative example of PPA prices for utility-scale solar in 2018. RMI is working with the Otero County Electric Cooperative (OCEC) to help bring on a 3.9 MW Solar System that will save all members money by reducing OCEC's wholesale energy costs[4]. The PPA for this system was set at $45/MWh or

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[3] Fu, Ran. "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2017." *Https://Www.nrel.gov/*, National Renewable Energy Laboratory, Sept. 2017, www.nrel.gov/docs/fy17osti/68925.pdf, Pg. 3-4.

[4] Zeranski, Todd, and Kevin Phelan. "New Mexico Cooperative Signs Record-Low U.S. Contract for Distributed Solar Energy - ENGIE Distributed Solar." *SoCore Energy*, Rocky Mountain Institute, 21 Feb. 2018, www.socoreenergy.com/new-mexico-cooperative-signs-record-low-u-s-contract-distributed-solar-energy/.

$.045/kWh for a 25 year period without an escalator. RMI is currently developing another solar PPA in Eastern Colorado for a 2 MW system. It has been priced at $50/MWh or $.05/kWh also for a 25 year period without an escalator.

While neither of these examples are in Missouri and both are in states with stronger solar resource profiles, RMI also modeled production output for Missouri using the NREL System Advisor model for solar insolation. RMI looked at a 3 MW system for Kansas City, MO, and estimated a PPA price of $56-$59/MWh or $.056-$.059/kWh. These prices are based on current solar PPA pricing being seen, but this can be influenced by a few different factors. This price could increase due to solar module tariffs, it could further decrease due to economies of scale beyond 3 MW, and it could decrease if global solar module prices continue to decline, as is projected by NREL. After reviewing recently agreed-to on-site PPA pricing for utility-scale solar, I believe the company can see a lower LCOE for the proposed solar system by having a competitive RFP for a third-party developer to construct the system.

With the declining cost of solar systems, the benefits of economies of scale, and the general location of the system, KCPL and GMO's subscription rate is higher than necessary. Based on all of this, I am concerned that KCPL's and GMO's proposed subscriptions are over-priced which may lead to slow adoption or otherwise hinder the success of the program. Rather than rely on unrealistic figures, the ultimate subscription price should be determined after considering responses to an open and competitive RFP process to construct the system.

III. Customer Access to Bill Data

Q. Why should customers be able to access their bill data?

A. As an advocate for clean energy access, I am in support of the Office of Public Counsel's recommendation for the company to pursue a "Green Button" program as proposed in Geoff Marke's Direct Testimony.

Q. What does OPC propose for the "Green Button"?

A. OPC proposes the adoption of the Green Button software to allow customers to access, share, and download their smart meter usage data to send it to third parties offering smart thermostats, remote home control programs, or rooftop solar systems. It is currently being used by multiple utilities as OPC cited in testimony.

Q: Why should the Commission support this proposal by OPC?

A. After reviewing this program, it would be beneficial for KCPL and GMO customers to have easier access to their billing data in order to share it with third parties who can offer assistance or advice on energy upgrades the customer may make to their property. If KCPL is able to offer this access to customers under their new CIS program, I encourage them to promote it. Data access will help customers more easily work with contractors to invest in energy efficiency programs or in a net-metered solar system. This data will be even more important for customers now with the upcoming solar rebates being offered and will also make it easier for customers to participate in utility sponsored energy efficiency programs.

Q. Does this conclude your rebuttal testimony?

A. Yes.