BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of a Working Case to Explore	)	
Emerging Issues in Utility Regulation	)	Case No. EW-2017-0245

RESPONSE OF KANSAS CITY POWER & LIGHT COMPANY AND KCP&L GREATER MISSOURI OPERATIONS COMPANY TO COMMISSION QUESTIONS

Kansas City Power & Light Company ("KCP&L") and KCP&L Greater Missouri Operations Company ("GMO") (collectively, "KCP&L" or "the Company") hereby submit comments to the issues addressed in the Missouri Public Service Commission's ("Commission") *Order Seeking Responses Regarding Distributed Energy Resource Issues, and Scheduling a Workshop Meeting* issued on September 6, 2017.

INTRODUCTION

KCP&L welcomes the opportunity to continue to participate in the discussion surrounding the topics of interest to both the Commission and Staff.

Prior to offering the Company responses, it is important to note that the topic of Distributed Energy Resources ("DER") has many policy implications. Conversations about DER are occurring at the Federal, State, Regional Transmission Organization, Utility, and Customer levels. The interrelationship of these perspectives creates a complicated issue that should be explored with precision. The Company understands that these questions are meant to continue the discussion of DER within the State, however, these questions are general and leave room for broad interpretation. The Company has endeavored to interpret these questions as openly as possible and provide responses that fit a plain understanding of the Emerging Issue Workshop. Going forward, the Company welcomes continued and specific discussion of these issues and how the State may best complement and promote the efforts put forth by all of the stakeholders.

RESPONSES

What are the current levels of distributed energy resources (energy efficiency, distributed generation, demand-response, etc) in Missouri?

To begin, the Company believes it is important to provide a definition of Distributed Energy Resources ("DER"). This step is not as straightforward as it might seem. DER is a developing concept, based in part on time tested technologies but incorporating many emerging technologies. As such, it is common to see announcements of new products and technologies that expand the definitions placed on DER. For the purpose of this response, the Company looks to the National Association of Regulatory Utility Commissioners ("NARUC") and their report, Distributed Energy Resources Rate Design and Compensation ("Manual"),

> A DER is a resource sited close to customers that can provide all or some of their immediate electric and power needs and can also be used by the system to either reduce demand (such as energy efficiency) or provide supply to satisfy the energy, capacity, or ancillary service needs of the distribution grid. The resources, if providing electricity or thermal energy, are small in scale, connected to the distribution system, and close to load. Examples of different types of DER include solar photovoltaic (PV), wind, combined heat and power (CHP), energy storage, demand response (DR), electric vehicles (EVs), microgrids, and energy efficiency (EE).[1]

Admittedly, the Company has had some reservation including EE in the definition of DER, but agrees with the further clarification offered by NARUC on the matter. NARUC adds, "This Manual includes EE as a resource, even though some may not. However, EE programs do effectively shift or shave load, or both, which certainly can fit within the view of acting as a resource, especially if the load shift can be predicted or scheduled."[2] The Company supports inclusion of EE when the criteria of predictability or being schedulable is added to the definition.

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[1] National Association of Regulatory Commissioners, Distributed Energy Resources Rate Design and Compensation, A Manual Prepared by the NARUC Staff Subcommittee on Rate Design ("NARUC Manual"), November 2016, page 45.

[2] Id. page 50.

In responding to the question presented by the Commission, the Company offers the following responses:

- Energy Efficiency ("EE") Levels – EE levels are defined utilizing reporting sources from the Company's recent Missouri Energy Efficiency Investment Act ("MEEIA") Programs.

Energy Savings (kWh)	**KCP&L**	**GMO**	**Total**
Cycle 1 – Net Verified[3]	188,992,755	214,411,282	403,404,037
Cycle 2 – Gross Reported[4]	166,089,331	82,810,809	248,900,140

- Demand-Response ("DR") Levels – DR levels are defined utilizing reporting sources from the Company's most recent MEEIA Programs.

Demand Savings (kW)	**KCP&L**	**GMO**	**Total**
Cycle 1 – Net Verified	54,236	68,333	122,569
EE Demand	34,275	40,857	75,132
DR Demand	19,961	24,476	47,437
Cycle 2 – Gross Reported	53,826	70,179	124,005
EE Demand[3]	28,346	21,621	49,967
DR Demand[4]	25,480	48,558	74,038

Please note that while the Company's Clean Charge Network ("CCN"), the EV charging system, has demand response capability, it is not included in the totals above.

[3] MEEIA Cycle 1 for KCP&L-MO was effective for 7/6/2014-12/31/2015. MEEIA Cycle 1 for GMO was effective 1/26/2013-12/31/2015. Net verified energy and demand savings are presented for Cycle 1.

[4] MEEIA Cycle 2 for KCP&L-MO and GMO became effective 4/1/2016. Gross savings are shown for 4/1/2016-6/30/2017. Cycle 2 is approved to be effective through March 30, 2019 for both KCPL-MO and GMO. Gross reported energy and demand savings are presented for Cycle 2. Savings have not been yet verified and finalized through the Evaluation, Measurement, and Verification (EM&V) process.

- Distributed Generation ("DG") Resource Levels – DG levels for the Company include net metering, Company-deployed DG, known generation connected to the grid at the distribution voltage level, and battery storage.

DER Capacity, MW DC	**KCP&L**	**GMO**	**Total**
Customer Owned	29.11	28.80	57.91
Utility Owned	0.20	4.60	4.80
Total	29.31	33.40	62.71

For the purpose of this response, the Company did not include customer-owned, emergency back-up generation. Also, as our systems do not include vehicle-to-grid functionality, we did not report any detail concerning EV in the DG category.

Should previous Commission policy decisions regarding demand-response aggregation be reconsidered?

The Company does not believe the policy decisions established in EW-2010-0187 need to be reconsidered at this time. In that case, the Commission determined that "Demand response load reductions of customers of the four Missouri electric utilities regulated by the Commission are prohibited from being transferred to ISO [Independent Transmission System Operators] or RTO [Regional Transmission Organizations] markets directly by retail customers or third party ARCs [Aggregators of Retail Customers]."[5]

The Company asserts that although technologies and the environment around demand aggregation have changed since the Commission action, efforts taken by electric utilities have changed as well. The most significant change is the inclusion of demand response programs

[5] EW-2010-0187, Order Temporarily Prohibiting the Operations of Aggregators of Retail Customers, Effective March 31, 2010.

within the MEEIA programs. This additional support and promotion has served to make demand aggregation an integral part of Company load planning and operation.

The Company has observed actions taken by other utilities, some in restructured states, and other RTOs to address demand aggregation. The Company believes these same actions have been noticed and considered within SPP, and in our assessment, SPP appears satisfied that the existing tariffs and policies are appropriate.

Should a model state tariff be designed?

We do not believe a model state tariff is needed. The Company believes the individual electric utilities are in a good place to judge their respective needs and approach the Commission if tariffs are needed.

Should changes be made to the Integrated Resource Planning (IRP) process to accommodate increased use of distributed energy resources?

Not at this time. The current IRP rules have proven to be flexible and accommodating to new demand side technologies. Whether through the review processes, screenings, or forecasting efforts associated with the current IRP rules, DER deployment can be incorporated and is already being considered within the planning process.

What information about distributed energy resources do the Regional Transmission Organizations need? What information do the utilities have? And what information are the utilities providing to the Regional Transmission Organizations?

As noted by SPP during its recent presentation to the Commission, currently there are no ongoing policy discussions related to DER. There is, however, an ongoing debate in the stakeholder process regarding how to comply with a FERC order related to reporting certain DERs. SPP is in the best position to inform this Commission on its needs for information in this area.

The Company has limited information regarding DER. Specifically, the Company maintains information concerning the installed capacity of customer generation resources and energy consumed at those locations.

SPP currently does not request information related to individual retail customer generating resources.

Is any new behind-the-meter technology or hardware needed to accommodate or facilitate the development of distributed energy resources?

Behind the meter technology can serve to enhance the deployment of DER. For example, we are seeing the role Smart Inverters can play with respect to distributed solar generation. Smart Inverters provide features beyond the conversion direct current produced by solar panels into alternating current provided by a normal inverter, including collection of data, providing reactive power support to regulate voltage and frequency, and provide the ability to ride through momentary grid disruptions without tripping offline. As DER penetration levels increase, such functions are necessary for the grid operators to optimize DER deployments, better control the grid[6] and ensure better grid operations. Utilities in jurisdictions with high penetrations of solar, such as Hawaii, Arizona, Nevada, and California, are working to develop rules and standards to incorporate smart inverter technology into their systems.[7]

Batteries are another technology to consider. These devices do not contribute "new" energy, but provide the ability to retain and release later, impacting the customers' demands on the energy grid or producing a new source of revenue for that customer. Most DER, if cost beneficial, may result in benefit to both the utility and the customer. Utility investment, or co-

[6] https://energy.gov/eere/success-stories/articles/eere-success-story-epri-lays-foundation-smart-inverter-technology

[7] https://www.greentechmedia.com/articles/read/a-state-by-state-snapshot-of-utility-smart-solar-inverter-plans#gs.k0l6618

funding, provides greater opportunity for the utility to leverage the DER asset for grid benefits. Also, there are many behind the meter technologies emerging that could benefit from co-managed utility operation.

Will any distribution system upgrades be required to accommodate or facilitate the development of distributed energy resources?

Yes, it is likely that the distribution systems will need to receive upgrades in response to expanded DER deployment. Recent efforts around Grid Modernization[8] provide some insight into the work expected. Further, examples have already been observed resulting from the growth of net metering. Distribution systems, once designed for moving energy one-way, from a centralized generation source to the remote customer, are now being used to pass energy produced from DG systems upstream.

Electric Power Research Institute ("EPRI") has identified a number of likely areas of modification that can be expected with DER penetration.[9] Those are:

- Line Reconductoring
- Transformer Upgrades or Adjustment
- Voltage Upgrade
- Voltage Regulation
- Smart Inverters
- Protection Systems
- Communications and Control

EPRI further notes that DER can impact the bulk power system.[10] Those impacts are:

- Resource Adequacy
- Flexibility Assessment
- Operational scheduling and Balancing

[8] "Grid Modernization" is a term associated with The Grid Modernization Initiative (GMI) initiated by the U.S. Department of Energy to create the "grid of the future". Within this initiative, participants are seeking to improve Resilience, Reliability, Security, Affordability, Flexibility, and Sustainability of the energy grid. More information may be found at https://energy.gov/under-secretary-science-and-energy/grid-modernization-initiative .

[9] *The Integrated Grid: A Benefit-Cost Framework.* EPRI, Palo Alto, CA: 2015. 3002004878, Section 6.

[10] Id, Section 7

- Transmission System Performance and Deliverability
- Transmission Expansion

The precise challenges introduced by DER can be specific and vary from circuit to circuit and differ from utility to utility. However, the Company is certain that beyond general Grid Modernization, improvements in communication and control infrastructure will be needed. A common requirement of DER technologies is the need to communicate and interact. Whether it be for coordination or simply for data sharing, the Company anticipates a universal need for increased communication within the grid. This need would be met by new or enhanced software and hardware systems, interconnected to existing grid controls and DER, and used by the Company to more actively monitor, control, and integrate DER into the operation function.

What process should be developed to provide for resource accreditation, including consideration of capacity factors?

Within the Company's current operation, resource accreditation occurs in one context, identifying loads of generation sources within the SPP. The Company believes existing accreditation processes are adequate given the current sizes and types of DER being deployed. Currently, when used for SPP purposes, resource accreditation processes are defined and would be applied regardless of the location or owner of the resource. However, since DER has typically been represented by small retail systems, smaller than those monitored by the SPP, they have been treated as a "load modifier". If the treatment of DER were to change, the change would need to occur within the SPP to ensure consistent application across the SPP footprint. This regional approach would ensure all participants have consistent rules, avoiding the potential for jurisdictional differences.

<u>Are there any other issues related to distributed energy resources that should be brought to the Commission's attention?</u>

Yes, the Commission should begin to focus attention of the rate designs related to DER deployment. To date, net metering represents the primary DER-related technology and has the biggest issue regarding rate making: cost shifting. Turning again to the Manual, NARUC addresses cost shifting, saying,

> "In the case of DER, often the billing determinants are lowered to mitigate the pressure on revenue collection effected by lower sales. Thus, the decline in usage would effectively be shifted to other customers when the billing determinants are reset to account for the decreased revenue received from the DER customers."[11]

NARUC then concludes its commentary, saying.

> "In sum, under the traditional ratemaking model and commonly used rate design, if the utility passes its relevant threshold of DER adoption, the utility may face significant intra-class cost shifting and erosion of revenue in the short run. If left unaddressed, the utility could face pressures in the long term that might prevent it from recovering its sunk costs, which are necessary to provide adequate service."

This issue has been explored in other jurisdictions. In Arizona, Arizona Public Service filed an Application before the Arizona Corporation commission for approval of a Net Metering Cost Shift Solution.[12] The amount of cost shifting observed was identified in the testimony of Charles Miessner,

> "We can only estimate this amount at this time because a precise amount would require rebilling all 18,000 solar customers and calculating their specific bill savings. However, in general terms, using the bill savings estimates for the representative residential customer, the annual costs shifted to other customers is approximately $800 using the average costs in rates and $1,000 using the short term marginal costs. With 18,000 solar

[11] NARUC Manual, page 67.

[12] Docket E-1345A-13-0248, Filed July 12, 2013.

> rooftop systems currently installed on APS's system, the total costs shifted to other customers are in the range of 15 to 20 million dollars per year."[13]

Closer to the KCP&L jurisdiction, Westar provided similar testimony in a proceeding before the Kansas Corporation Commission. Dr. Ahmed Faruqui with Brattle, on behalf of Westar, in his comments for the General Investigation to Examine Issues Surrounding Rate Design for Distributed Generation Customers[14], testified to the following,

> "Under the current regime in which DG and non-DG residential customers pay the same rates, the shortfall in revenue associated with DG customers means that residential rates will need to be increased in order to fully recover the costs of the power grid. As a result, non-DG customers will pay for both their use of the power grid as well as that of the DG customers' use of the power grid, to the extent the DG customers are not contributing to their fair share of the grid costs because of the nature of the current two-part rate design that applies to all residential customers today.
>
> The extent of this unintended cross-subsidy will depend on a number of factors, such as the number of customers adopting PV, the average size of PV installation, and the rate structure and level. A survey of studies in other jurisdictions designed to quantify the magnitude of this cost shift found that it could amount to between approximately $400 and $1,800 per DG customer per year. This is summarized in Figure 4, with supporting details in Appendix B. While the magnitude of the subsidy in Westar's service territory may differ from these estimates due to differences in customer and cost characteristics across utilities, there is little doubt that such a subsidy exists under the current rate structure."[15]

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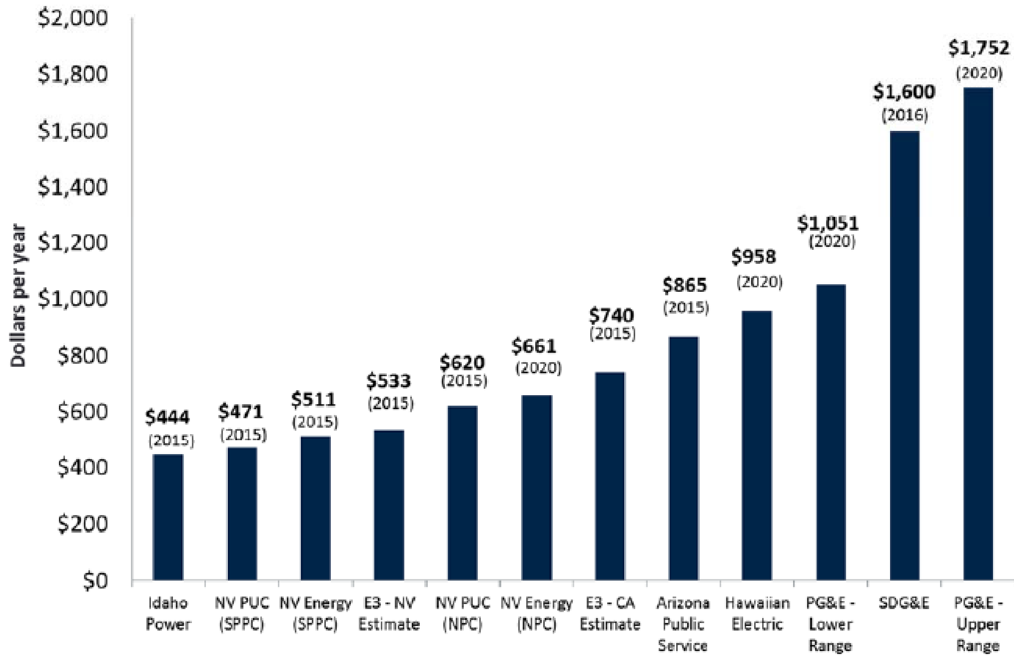
[13] Docket E-1345A-13-0248, Direct Testimony of Charles Miessner, Filed July 12, 2013, page 15, line 20.

[14] Docket 16-GIME-403-GIE

[15] Docket 16-GIME-403-GIE, Affidavit of Dr. Ahmad Faruqui in Kansas Generic Docket on Distributed Generation Rate Design, March 17, 2016, page 7 and 8.

Figure 4: Rooftop PV Cost-Shift Estimates ($ per PV customer per year)



Notes: Year indicates date of cost-shift estimate, which is sometimes a forecast. In some cases, reported estimates were converted to annual dollars per NEM customer for comparison purposes. The PG&E ranges are calculated using assumptions from the California Public Utilities Commission's Public Modeling Tool. PPC and NPC refer to Sierra Pacific Power Company and Nevada Power Company service territories respectively.

In the Kansas proceeding, the Kansas Corporation Commission recently issued an order acknowledging this cost shifting is occurring and supporting the position that alternate rate designs could be proposed to alleviate this shifting. For Missouri, this issue will need to be resolved consistent with statutes currently limiting the rate designs that can be deployed uniquely to net metering customers. Paragraph 3(2) of Section 386.890, RSMo Supp. 2007, states that the utility must,

> (2) Offer to the customer-generator a tariff or contract that is identical in electrical energy rates, rate structure, and monthly charges to the contract or tariff that the customer would be assigned if the customer were not an eligible customer-generator but shall not charge the customer-generator any additional standby, capacity, interconnection, or other fee or charge that would not otherwise be charged if the customer were not an eligible customer-generator;

This is further codified in 4 CSR 240-20.065(4)(B) and states,

> (B) A tariff or contract shall be offered that is identical in electrical energy rates, rate structure, and monthly charges to the contract or tariff that the customer would be assigned if the customer were not an eligible customer-generator but shall not charge the customer- generator any additional standby, capacity, interconnection, or other fee or charge that would not otherwise be charged if the customer were not an eligible customer generator.

While these provisions have provided protection to net metering customers while the law was new and the industry was in development, they are now ensuring a subsidy to net metering customers and the expense of non-net metering customers. If the Commission wishes to move toward rate designs that are more balanced and account for the impact to non-net metering customers, this limitation must be resolved or the Commission should entertain more balanced rate designs that would be applied to all customers.

CONCLUSION

The Company appreciates the opportunity to provide comments and participate in this continuing dialog on industry issues and has endeavored to interpret these questions as openly as possible and provide responses that fit a plain understanding of the Emerging Issue Workshop. DER technologies are an important part of the energy grid and represents a growing area of focus for the electric utility. Establishing a proper environment at the Federal, State, Regional Transmission Organization, Utility, and Customer levels for these resources will be important to ensure benefit for all stakeholders. Efforts should seek to enable beneficial technologies, where applicable, ensure cost based compensation for participants, and limit subsidy provided by non-participants. KCP&L welcomes continued and specific discussion of these issues.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I do hereby certify that a true and correct copy of the foregoing document has been hand delivered, emailed or mailed, postage prepaid, this 20th day of October, 2017, to all counsel of record.

/s/ Roger W. Steiner

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