BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the General Investigation to Examine Issues Surrounding Rate Design for Distributed Generation Customers.	)))	Docket No. 16-GIME-403-GIE

REPLY COMMENTS OF WESTAR ENERGY, INC. AND KANSAS GAS AND ELECTRIC COMPANY REGARDING COST-BASED RATES FOR CUSTOMERS WITH DISTRIBUTED GENERATION

COME NOW Westar Energy, Inc. and Kansas Gas and Electric Company (collectively referred to as "Westar") and file their Reply Comments in the above-captioned docket. In support of its comments, Westar states:

I. Introduction

1. Westar filed its Initial Comments in this docket on March 17, 2017, to (1) discuss why customers with distributed generation (DG) should be charged a different, cost-based rate, (2) explain why the Commission should allow utilities to implement a three-part rate with a demand charge for private DG customers, (3) demonstrate that private DG customers do not, as a generic matter, provide verifiable, quantifiable system benefits other than displacing other energy when they export energy into the system, and (4) discuss how the implementation of a three-part rate for private DG customers can help foster the development of solar as an energy resource over the long-term. Westar provided the Affidavits of Ahmad Faruqui, Ashley Brown, and Jeffrey Martin in support of its Initial Comments.

2. A number of other parties also filed Initial Comments in the docket: Staff, Citizens' Utility Ratepayer Board (CURB), Kansas City Power & Light Company (KCP&L), Empire District Electric Company (Empire), Midwest Energy, Inc. (Midwest), Sunflower Electric Power Corporation and Mid-Kansas Electric Company, LLC (Sunflower), Southern Pioneer Electric Company joined by the Kansas Electric Cooperatives (Southern Pioneer and KEC), Cromwell

Environmental, Inc. (Cromwell), Climate + Energy Project (CEP), United Wind, Inc. (United Wind), and Brightergy, LLC (Brightergy).

II. Executive Summary

3. The majority of the parties filing comments in the docket – Staff, CURB, KCP&L, Empire, Midwest, Sunflower, Southern Pioneer and KEC, and Westar – agreed that the current rate structure for private DG customers is not cost-based and creates a subsidy from non-DG customers in favor of private DG customers. The majority of the parties – Staff, CURB, KCP&L, Empire, Southern Pioneer and KEC, Sunflower, and Westar – also agreed that private DG customers should be placed in a separate rate class and many of the parties – Staff, KCP&L, Midwest, Sunflower, and Westar – believe that the use of a three-part rate with a demand charge would help to correct the inequities in the current rate structure.

4. The exceptions to this are Cromwell Environmental, Cromwell, CEP, United Wind, and Brightergy. However, none of these parties offer any substantive basis that justifies continuation of the current, non cost-based rate structure for private DG customers. Instead, they simply argue that the Commission should continue to study the issue and delay any action that would correct the existing problems. As is discussed below and in the Reply Affidavits of Ahmad Faruqui, Ashley Brown, and Jeffrey Martin, attached hereto, there is no reason for the Commission to delay taking action on this issue and acting now will actually help foster the long-term development of DG, including private solar.

5. These parties also suggest that the Commission should conduct a value of solar study and argue that the benefits of solar, including societal benefits, should be considered in the ratemaking process. However, as is discussed below and in the attached Reply Affidavits, no state Commission has used a value of solar study as a basis for setting rates. Brown Reply Affidavit, at

p. 14. Additionally, the benefits suggested by these parties are all either de minimis, not quantifiable, or not distinguishable from the benefits provided by utility-scale utility renewable resources.

6. With respect to societal benefits such as reduction of CO_2 emissions, if the Commission decided to change its prior approach and consider societal benefits in the ratemaking process – an approach the Commission has expressly rejected in prior decisions, it would be unduly discriminatory and costly to only consider the societal benefits of private DG and not of other utility-scale resources available to serve all customers. The "value of solar" approach to societal benefits – where societal benefits are only considered when valuing private DG and not for other resources – results in traditional customers paying extra to purchase environmental benefits they could get much more cheaply from other sources (i.e., from utility scale renewable resources). As Mr. Brown explains in his Reply Affidavit,

> a "value" approach to the societal benefits of DG that leads to traditional customers paying extra to purchase environmental benefits they could get much more cheaply elsewhere makes no sense. Those seriously concerned about climate change and air pollution ought to think hard about whether they risk exhausting the general public's limited appetite to spend money on these issues if they channel that money disproportionately towards a technology which is extremely inefficient in addressing them, when much more cost effective measures are available.

Brown Reply Affidavit, at p. 12.

III. The rate charged for service provided to private DG customers must be adjusted to be cost-based and non-discriminatory and to eliminate subsidies.

A. DG customers are partial requirements customers with different load characteristics than non-DG residential customers and should be charged based on a different rate structure.

7. DG customers are partial requirements customers with different, and less predictable, load characteristics than non-DG residential customers and, thus, private DG

customers should be placed in a separate class. As Westar discussed in its Initial Comments, the current two-part rate structure is both unduly discriminatory and inequitable when applied to private DG customers because it does not recover the costs private DG customers impose on the system and shifts costs to customers without distributed generation. The majority of the commenting parties agree with these conclusions. Martin Reply Affidavit, at p. 3.

8. In fact, Cromwell's Initial Affidavit actually support this conclusion as well. As Dr. Faruqui explains,

> Cromwell provided data which highlights the problem associated with Westar's current two-part rate for DG customers which three-part rates are intended to address. Table 3 of the Cromwell filing shows a DG customer with lower consumption but the same peak demand as a non-DG customer.[1] That low load factor is a characteristic consistently shared by DG customers. By installing rooftop solar PV systems, DG customers reduce their total energy consumption but do little to change their maximum demand or system peak-coincident demand, and therefore largely do not reduce their dependence on the grid or the utility's installed generation capacity and its associated costs. A three-part rate would do a better job than the current rate of recovering these costs associated with that dependence.

Faruqui Reply Affidavit, at p. 2.

9. Midwest Energy suggests that private DG customers should not be placed in a separate rate class and, instead, utilities should make rates for all residential customers more cost-based by the use of a three-part rate. *See* Midwest Energy Initial Comments, at p. 5.

10. Westar agrees that rates for all residential customers could be made more cost-based by use of a three-part rate because the current two-part rates are mismatched with how Westar and other utilities actually incur costs. Martin Reply Affidavit, at p. 3. However,

[1] Cromwell Direct Comments, page 5, para. 13.

Midwest's suggestion is beyond the scope of this docket. The purpose of this docket is to address rate design only for private DG customers and Westar has focused on that issue. *Id.*

11. Additionally, customers with private DG will also be more likely to be able to adapt to and understand a three-part rate and modify their consumption patterns in response to a demand charge because those customers are "more knowledgeable about energy efficiency, energy production, and kW versus kWh than the average residential customer." Brown Reply Affidavit, at pp. 3-4. This is at least in part because customers with private DG have "made a conscious decision to not only generate their own power, but also to commit very substantial amounts of money into controlling their expenses for electricity." *Id.*

12. Finally, as Dr. Faruqui and Mr. Brown discuss, there is clear justification for separation of customers with private DG into a separate rate class. *See* Faruqui Reply Affidavit, at pp. 1-2; Brown Reply Affidavit, at pp. 2-3. They have a different load profile than customers without DG. Brown Reply Affidavit, at pp. 2-3. Mr. Brown explains that

> in volumetrically recovered rates, much of the cost of providing service to a partial requirements DG customer is left uncovered by those for whom the costs were incurred. Such a customer might have a very low net usage, but a high peak demand during sunset hours (for example), resulting in a high cost to serve that customer that is not captured under a traditional rate structure. DG customers, under volumetrically defined rates, are not paying their full share of the fixed and demand costs they impose on the system, despite the fact that their self-generation does nothing to reduce the fixed and demand charges the utility incurs for serving them. The three-part tariff proposed in this docket resolves that problem, because DG customers will pay their fair share of fixed and demand charges, thereby ending the practice of shifting the burden for paying those revenues to non-DG customers.

Brown Reply Affidavit, at p. 2. The fact that rates could be improved for all residential customers does not change the conclusion that customers with private DG should be in a separate rate class.

13. Cromwell argues that there are large variations in the usage patterns of customers with private DG and that does not lend itself to generalizations about their usage or the grouping of those customers in a separate rate class. Cromwell Initial Comments, at pp. 3-6. Dr. Faruqui explains that this assertion by Cromwell does not "account for the fact that DG customers are truly distinct from non-DG residential customers and have a different associated cost of service than other residential customers." Faruqui Reply Affidavit, at p. 1. These different characteristics include "a monthly load factor for DG customers that is significantly different from the residential class average, the regular export of electricity to the power grid, and volatile and intermittent energy needs. These are not characteristics that DG customers share with other residential customers." *Id*. at pp. 1-2.

14. Additionally, load diversity is not a reason to include or exclude customers from a rate class – customers within any rate class "will exhibit some degree of load diversity." Faruqui Reply Affidavit, at p. 2. Rate classes are created when a group of customers have certain common characteristics that "drive the costs they impose on the system, in spite of load diversity." *Id*.

15. United Wind argues that a separate rate class for all customers with private DG is not appropriate because wind resources can actually help reduce peak demand and because wind DG resources have a different load profile than solar. United Wind Initial Comments, at ¶ 10. Even if United Wind's assertions that wind DG has peak shaving potential were true, that would not "set DG wind customers apart from other DG partial requirements customers in a way that requires a separate class or rate." Brown Reply Affidavit, at p. 4. This is because "[a]ll distributed generation customers remain the same in the key respect that a rate that bundles fixed and demand costs into a variable energy charge is likely to result in a failure to collect the cost of service to the customer." *Id*. However, as Mr. Brown discusses, in Westar's service territory, wind generation

does not occur in significant amounts at the time of system peak demand. Brown Reply Affidavit, at p. 16.

16. With a three-part rate, the bills of wind DG customers may vary from the bills of solar DG customers but that "demonstrates why such a rate design is beneficial." *Id*. at p. 5. If a customer's wind resource offsets some portion of his or her peak demand, that customer will see "a double savings under a three-part rate – not only a savings in terms of a reduction of kWh purchased, but a savings in terms of a lower demand charge." *Id*. This is because the costs imposed on the system to meet the peak demand of a customer with distributed wind generation would be lower. *Id*.

17. Additionally, most – if not all – of United Wind's customers are rural agricultural businesses who are commercial customers (not residential customers) and who are presumably already paying a three-part rate. Westar's proposal in this docket would have no effect on these customers. Martin Reply Affidavit, at pp. 3-4.

B. The Commission should not delay acting to correct the unreasonable subsidy that currently exists from non-DG customers to customers with private DG.

18. Cromwell, United Wind, and CEP argue that the current low levels of rooftop solar adoption in Kansas mean that the Commission should delay making changes to the DG rate. They also suggest that the industry is in its infancy and, as a result, could be more sensitive to regulatory changes. *See* Cromwell Initial Comments, p. 1; United Wind Initial Comments, p. 4; CEP Initial Comments, p. 5. Both of these assertions are erroneous.

19. First, the suggestion that the solar industry is in its infancy is incorrect. The comments filed by Cromwell and CEP demonstrate that this is not the case when they state that the total installed price for residential PV has fallen dramatically since 2008 and that solar has become a significant source of employment across the country. *See* Cromwell Initial Comments,

at p. 2; CEP Initial Comments, at pp. 2-3. As Dr. Faruqui explained, the rooftop solar industry is not a "newly emerging industry." Faruqui Reply Affidavit, at p. 6. "Rooftop PV costs have come down significantly over the last several years, and the solar industry has grown at the same time." *Id*. at pp. 6-7. An infant industry, on the other hand, would be not yet "widely deployed, and not yet to have realized the kind of cost savings available through mass production and the learning-by-doing available only through experience." Brown Reply Affidavit, at p. 7.

20. Second, the fact that there is a lower level of rooftop PV deployment in Kansas actually means that this is the ideal time for the Commission to act to correct the existing subsidy. As Mr. Brown explains, the "timing of good rate design is like the Chinese proverb about planting a tree – the best time to do it was 20 years ago; the second best time is now." Brown Reply Affidavit, at p. 6.

21. There are significant benefits to correcting the DG rate design before rooftop PV is adopted in larger numbers. *See* Faruqui Reply Affidavit, at p. 6; Brown Reply Affidavit, at pp. 6-8. Those benefits include:

- Lower levels of adoption make it easier to address issues like grandfathering of existing DG customers. The "impacts of grandfathering on customers – and the contentiousness of the issue – grow as more customers adopt rooftop PV." Faruqui Reply Affidavit, at pp. 5-6.

- Customer education is easier before higher adoption levels – and a greater split between customers who are grandfathered and those who are not – occur. "It is easier to educate customers about their rate options when the vast majority are in a similar situation than when they have become bifurcated." *Id*.

- Correcting the DG rate design now provides certainty to customers who are considering investing in private DG. *Id*. at p. 6; Brown Reply Affidavit, at p. 6; Martin Reply Affidavit, at p. 4. Change to DG rate design is inevitable because "net metering with flat volumetric rates is not sustainable." Faruqui Reply Affidavit, at p. 6. Providing clarity with respect to the rate design now will "give clarity to those customers considering investing in solar and should help encourage further growth of that industry in Kansas." Martin

Reply Comments, at p. 5. Customers who install private DG are "making a large investment, and it is important to set rules that stabilize the long term, rather than changing the rules mid-stream." Brown Reply Affidavit, at p. 6.

- The decision to change rate design does not "get easier or less controversial once many homeowners have made significant investments in private rooftop solar systems. Once that happens, the already difficult discussion of cross subsidies becomes even more complicated." Brown Reply Affidavit, at p. 6. Acting now will ensure that the minimum number of customers who have already installed private DG systems will be impacted by the change.[2] Martin Reply Comments, at p. 5. That number will continue to grow the longer the Commission waits to make a decision regarding rate design. *Id*.

22. United Wind argues that the size of the current subsidy from customers without DG to customers with private DG is small compared to other factors that impact customers' bills. United Wind Initial Comments, at p. 3. This argument is misleading. The fact is that the subsidy exists and that it will continue to grow as solar installations grow and "should be addressed while it is still practical and less disruptive to do so." Faruqui Reply Affidavit, at p. 6.

23. Cromwell argues that there is a statutory cap on net metering participation in Kansas of 1% and that cap will limit any negative consequences of the problems with the existing rate design for customers with private DG. *See* Cromwell Initial Comments, at p. 1. As Dr. Faruqui explains, implicit in Cromwell's argument is an assumption that "the participation cap is firm." Faruqui Reply Affidavit, at p. 7. However, in other states, as participation has approached these caps, "the caps have consistently been raised to accommodate additional participation." *Id*.; *see also* Brown Reply Affidavit, at p. 8. The figure below, replicated from page 8 of Dr. Faruqui's

[2] Under the settlement agreement approved by the Commission in the 15-115 Docket, DG customers that had installed and connected their DG systems to Westar's system prior to October 28, 2015, are grandfathered under the "Residential Standard Service" tariff; however, DG customers who install and connect their DG systems on or after October 28, 2015, take service under the "Residential Standard DG" tariff and will be impacted by any tariff change that is implemented as a result of this docket. *See* Martin Reply Affidavit, at p. 4.

Reply Affidavit, demonstrates this trend with respect to caps and the persistent increase that has occurred across the country.

2.1 Program Caps Have Increased Over Time

Many PUCs and state legislatures have modified net metering program caps over time. In the early 2000s, program caps were generally at 1% or less of peak demand, while today, a much wider range of program caps exist, with a number of caps at 5% of peak demand or more (Figure 3). Although states define program caps in numerous ways, Figure 3 shows that caps, once instituted, have always increased over time. In addition, a number of states that had policies initially without caps have instituted them over time. Text Box 3 highlights a number of recent efforts to expand net metering program caps; other ongoing efforts to limit net metering have focused on how net metered systems are compensated, rather than on the program cap. For example, Arizona Public Service in 2013 proposed adding a fixed fee to net metered customers' bills. Kansas and Oklahoma enacted legislation in 2014 that could add charges to net metered customers' bills (H.B. 2101 and S.B. 1456, respectively).

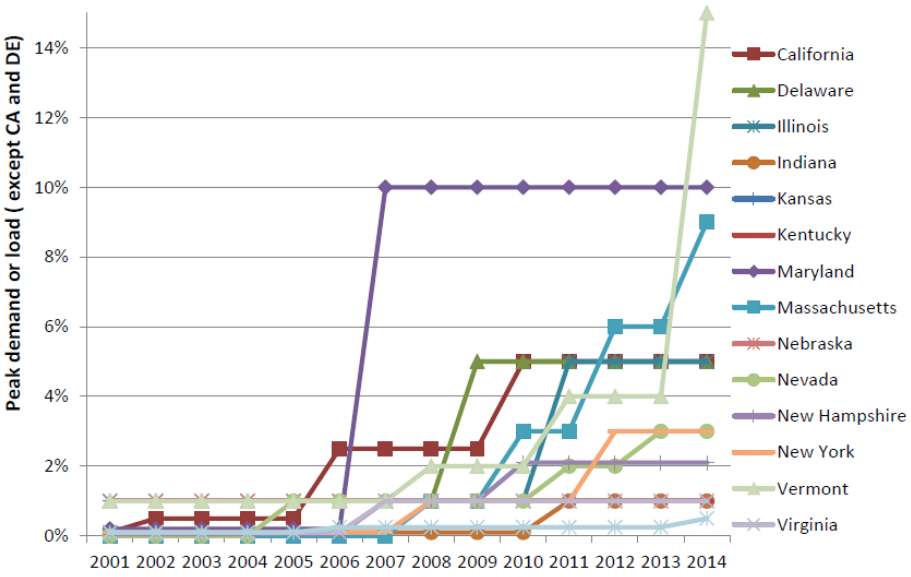

Figure 3. Major revisions to net metering program caps, 2001–2014

Source: J. Heeter, R. Gelman, L. Bird, "Status of Net Metering: Assessing the Potential to Reach Program Caps," September 2014.

24. Given this history in other states, a cap is "not a very effective way to protect non-solar consumers, as far as setting a real limit on the amount of subsidization of a given resource." Brown Reply Affidavit, at p. 8. Rather,

> a cap is a signal of coming rate uncertainty. It is far better to have a proper rate structure, such as a three-part rate, that does not require a cap, because it is inherently just and reasonable, and therefore, sustainable over time, not matter how many customers participate. If rate are set properly, imposing costs on cost-causers and

> eliminating subsidies – the level of market participation by solar will find its appropriate level without the need for artificial caps.

Brown Reply Affidavit, at pp. 8-9.

IV. A three-part rate with a demand charge is the appropriate rate structure for customers with private DG and a value of solar study is not necessary for the Commission to make this determination.

25. As Westar explained in its Initial Comments, the use of a three-part rate for private DG customers addresses the issues that currently exist with respect to the two-part rate and private DG customers. Staff, Sunflower, and KCPL all support the use of a three-part rate with a demand charge for customers with private DG. Several other parties agree that the rate paid by customers with private DG needs to be adjusted but make different suggestions regarding rate structures that would help address the existing problems. Cromwell, CEP, and Brightergy do not address any rate design options substantively and instead argue that the Commission should take more time to study possible rate design options and delay implementation of any new rate design.

A. A Kansas-specific study is not necessary for the Commission to design reasonable, cost-based rates for customers with private DG.

26. Cromwell, CEP, and Brightergy argue that the Commission should delay taking any action in this docket and conduct a Kansas specific study of the benefits that private DG provides. However, a Kansas specific study is not going to change the conclusion that a three-part rate with a demand charge is appropriate for private DG customers because the factors on which this conclusion is based are not state specific.

27. No study is required for the Commission to take steps to mitigate the existing cross subsidy and implement a rate design change such as the three-part rate proposed by Westar. "The notion of a study relates to the argument that there should be a study of the 'value of solar,' a concept that is not directly relevant to a rate design change, but rather seeks to ascribe value to

private DG in excess of the value of the generation utilities can provide to their customers at utility scale." Martin Reply Affidavit, at pp. 5-6. Three-part rates are designed to "reflect the utility's underlying cost structure. They account specifically for the costs that the utility is allowed to recover through rates, and nothing more. As such, Westar's cost of service study provides the foundation necessary to develop a three-part rate. There is no additional research or data that is needed to develop such a rate for residential DG customers." Faruqui Reply Affidavit, at p. 3. A Kansas-specific VOS study will "not change the underlying principles that support the transition to a three-part rate structure." *Id*.

28. The factors that Cromwell lists that would be included in a Kansas-specific study[3] may be relevant to "projections about the future expansion of solar in Kansas;" however, none of these factors are relevant with respect to the rates the utility charges DG customers for its distribution, transmission, energy, demand generation capacity and customer service." Brown Reply Affidavit, at p. 9.

29. For example, the amount of sunlight in Kansas may be a very relevant factor for a customer deciding whether to invest in solar. However, when designing rates for that customer, the question is "how to fairly charge customers for the costs they impose on the system, while recognizing any actual savings to the utility provided by DG. A three-part rate can accomplish this, regardless of how much sunlight (much less sunlight specific to Kansas) it available." *Id*. at p. 10. In fact, a three-part rate would capture many of the potential benefits of rooftop PV listed by Cromwell, including avoided energy/fuel, energy losses/line losses, and avoided capacity. Faruqui Reply Affidavit, at p. 4.

[3] Cromwell lists factors including "amount of sunlight, diversity of generation capacity of affected utilities, state incentives or disincentives, wholesale market prices, fluctuations in fuel price and changes in the demand curve for each utility." Cromwell Initial Comments, at p. 7.

B. A time-of-use rate is not a substitute for a three-part rate with a demand charge.

30. Brightergy argues that a time-of-use (TOU) volumetric charge would be an appropriate alternative to a three-part rate with a demand charge. *See* Brightergy Initial Comments, at p. 4. This assertion is incorrect. A TOU rate is not a substitute for a demand charge and does not address the problems with the existing two-part rate being used today.

31. As Dr. Faruqui explains, there are three types of costs:

> customer-related, capacity-related, and energy-related. Volumetric TOU rates can capture the energy-related costs if they vary by time of day, by day of the week, by month, and by season. Customer-related costs are costs that are driven by the number of customers on the system and include costs related to providing metering, billing, and customer service (such as staffing of call centers) and they will sometimes also include the cost of installing the line drop from the nearest pole and sometimes also the cost of nearest pole transformer. Capacity-related costs consist of those costs that are related to distribution, transmission, and generation. Transmission and generation capacity are sized based on expected peak demand. Distribution costs are going to depend in part on the customer's connected load (which can be approximated by the customer's non-coincident demand) and the customer's peak demand at the time of the distribution system peak.

Faruqui Reply Affidavit, at p. 5.

32. A rate based on a purely volumetric TOU charge, without a demand charge, would still recover customer-related and capacity-related costs through a volume-based rate, just as the current two-part rate does. Id. As a result, reductions in volume are "still likely to result in unrecovered fixed costs that are redistributed in a utility's next rate case." *Id.*

33. However, "volumetric TOU charges and demand charges can be viewed as complements rather than substitutes . . . An economically efficient rate would capture the costs of the grid with demand charges and the costs of energy with an energy-based time-of-use rate." *Id.*

Rates that combine a volumetric TOU charge with a demand charge are fairly standard practice in the industry for commercial and industrial customers. *Id*.

C. Other rate design options.

34. Several parties suggest alternative rate designs, such as access charges or stand-by charges, that might help address the existing cross-subsidy and make rates for customers with private DG more cost-based. While Westar does not object to these approaches as they certainly achieve a similar end of removing or reducing the cross subsidy, Westar prefers the three-part rate with a demand charge because it is the most appropriate solution today. *See* Martin Reply Affidavit, at p. 6.

V. Any alleged benefits of private DG are either de minimis, not quantifiable, or not distinguishable from the benefits provided by utility-scale utility renewable resources and should not be considered in the ratemaking process.

35. As Westar explained in its Initial Comments, the Commission's Order opening this docket indicates that any discussion of costs or benefits caused or provided by private DG customers will be limited to costs/benefits that "may decrease the utility's **cost of providing service**." Order Opening Docket, at ¶ 8 (emphasis added). This language precludes discussion or consideration of any alleged external, non-quantifiable benefits attributable to DG.

36. Because the benefits of private DG suggested by Cromwell, United Wind, Brightergy, and CEP are all either de minimis, not quantifiable, or not distinguishable from the benefits provided by utility-scale utility renewable resources, those benefits should not be considering in the ratemaking process. In its Initial Comments, Staff agreed with this conclusion and explained that a three-part rate will effectuate consideration of any relevant benefits. Staff Initial Comments, at p. 16; *see also* Faruqui Reply Affidavit, at p. 4 ("many of the potential benefits

of rooftop PV listed in CEP's direct comments would be captured through a three-part rate, if the DG customer is indeed able to provide them").

A. Societal benefits of private DG should not be considered in the ratemaking process.

37. CEP suggests that "societal benefits" are important for the Commission to consider when designing rates for customers with private DG. CEP Initial Comments, at pp. 6-7. However, consideration of societal benefits for private DG would be inconsistent with Commission precedent and would be discriminatory if only considered for private DG resources and not in a resource neutral manner, leading to an unnecessarily high cost for customers to "purchase" these benefits.

38. First, consideration of societal benefits in the ratemaking process is inconsistent with previous Commission orders where the Commission indicated it would not consider the value of externalities because they were very difficult to quantify. In previous dockets, the Commission has made it clear that it does not believe externalities – such as indirect environmental and health benefits – should be considered when evaluating programs proposed by utilities. The Commission does not rely on the societal test when evaluating energy efficiency programs proposed by utilities because "attempting to quantify such indirect societal environmental and health benefits is difficult" and the "analysis may also be viewed as less closely related to the Commission's policy objectives arising from its statutory duty and role as a regulator of utility rates." *In the Matter of a General Investigation Regarding Benefit-Cost Analysis and Program Evaluations for Energy Efficiency Programs, Order Setting Energy Efficiency Policy Goals, Determining a Benefit-Cost Test Framework, and Engaging a Collaborative Process to Develop Benefit-Cost Test Technical Matters and an Evaluation, Measurement, and Verification Scheme*, Docket No. 08-GIMX-442-GIV, at ¶ 36 (June 2, 2008) (emphasis added); see also *In the Matter of a General Investigation of*

Energy-Efficiency Policies for Utility Sponsored Energy-Efficiency Programs, Order, Docket No. 12-GIMX-337-GIV, at ¶ 15 (March 6, 2013) (stating that quantifying indirect societal environmental and health benefits is difficult and the societal test is vague).

39. Second, it would be discriminatory for the Commission to consider the value of one type of generation resource available to serve customers – private DG – but not consider the value of all other resources the utility has to serve customers, including utility-scale renewable generation. The inclusion of "externalities in an assessment of the value of solar would need to be accompanied by a similar assessment of the externalities associated with all other potential energy resources. It does not make sense to only focus the externalities associated with rooftop solar." Faruqui Reply Affidavit, at p. 4.

40. Although utility scale renewables provide the same societal benefits that renewable DG provides, the Commission has never allowed an adder for the value of societal benefits to the cost of renewable generation constructed by a utility. In fact, as Westar indicated in its Initial Comments, the Commission expressly denied such an adder – despite the fact that it is contemplated by Kansas statute – when requested by Westar for the first set of wind farms we constructed. *See* Final Order, *In the Matter of the Petition of Westar Energy, Inc. and Kansas Gas and Electric Company (collectively "Westar") for Determination of the Ratemaking Principles and Treatment that Will Apply to the Recovery in Rates of the Cost to be Incurred by Westar for Certain Electric Generation Facilities and Power Purchase Agreements under K.S.A. 2003 Supp. 66-1239*, Docket No. 08-WSEE-309-PRE, pp. 39-40 (Dec. 27, 2007).

41. Societal values such as those mentioned by CEP are likely "available at a much lower price from other sources (for example, large-scale solar and wind installations provide carbon-free electricity at much lower cost than private rooftop solar)." Brown Reply Affidavit, at

p. 11. The appropriate price to be paid for a given benefit "should always be considered within the wider context of whether other resources might be able to offer the same values at lower cost." *Id*. The "'value' approach to the societal benefits of DG that leads to traditional customers paying extra to purchase environmental benefits they could get much more cheaply elsewhere makes no sense." *Id*. at p. 12. Customers have the right to receive a just and reasonable cost-based price for their energy and should not be required to pay more for one type of resource, which is valued using a method that is not being applied to any other utility resources. Martin Reply Affidavit, at p. 7.

B. *A value of solar study is not necessary for the Commission to make a determination in this docket.*

42. Several of the parties argue that the Commission should conduct a Kansas-specific value of solar study before making a decision on rate design for customers with private DG. However, as discussed above, a Kansas-specific study will not change the conclusion that a three-part rate is appropriate for private DG customers. "Modernizing the rate design for customers with private DG does not require a study, or a determination of the 'value of solar.'" Martin Reply Affidavit, at p. 6.

43. Additionally, value of solar studies have been shown to be highly subjective with the results being very predictable based on the author of the study. These studies "fail by their own standards, because they are inherently so complex and require so many judgment calls about parameters and inputs that even the best-intentioned studies are inevitably subjective and controversial." Brown Reply Affidavit, at p. 13. Mr. Brown explains that value of solar studies

> are inherently so complex and require so many judgment calls about parameters and inputs that even the best-intentioned studies are inevitably subjective and controversial. If reasonably complete, value of solar studies are extraordinarily complex and, to be done correctly, these studies require a great deal of time and expense. Moreover, the results, no matter how honestly derived, are always going to be highly subjective, full of debatable and contentious

> assumptions, and subject to severe criticism by any number of interest groups.

Id. at p. 13; *see also* Faruqui Reply Affidavit, at pp. 3-4.

44. No state Commission has used a value of solar study as a basis for setting rates. Brown Reply Affidavit, at p. 14. Instead, regulators have preferred either cost-based or market-based rates to a "value" type of analysis. *Id*. at p. 15. However, to the extent the Commission decides there is a reason to treat private DG resources differently from utility scale renewable resources and consider their value, data is available from a number of other sources including a variety of studies, federal data on sun exposures, and solar production estimating tools and no additional study is necessary in this docket. *See* Martin Reply Affidavit, at p. 8.

45. Rather than further delaying taking steps to correct the cross-subsidy, Westar recommends that the Commission leave customers with private DG in a separate class and establish a more cost-based rate for those customers at this time. In each future rate case, the utilities will conduct and file a class cost of service (CCOS) study, with private DG customers separated into their own class, and all intervening parties will have the ability to study the data and substantiate their own positions and conclusions. Martin Reply Affidavit, at p. 8. A CCOS study is a very detailed, specific study that will capture all measurable costs and benefits of the DG class without substantial additional cost and without further delay. "If a meaningful level of costs or benefits do become quantifiable in the future, subsequent CCOS studies will reflect this and the rate design implemented in each rate case can change over time as the class changes." *Id*.; *see also* Faruqui Reply Affidavit, at p. 3 ("Westar's cost of service study provides the foundation necessary to develop a three-part rate. There is no additional research or data that is needed to develop such a rate for residential DG customers").

VI. Conclusion

46. Westar requests that the Commission (1) find that private DG customers should be charged a cost-based rate different from the current two-part rate utilized now because the current rate structure coupled with net metering is not cost-based, creates inequitable subsidies, and actually deters development of solar as a long-term, sustainable resource, (2) find that a three-part rate with a demand charge is an appropriate, reasonable, and cost-based rate for private DG customers, (3) find that the alleged benefits associated with DG are not quantifiable and do not provide a sufficient basis to retain the status quo rate structure and resulting cross-subsidy for private DG customers, and (4) authorize utilities to implement a three-part rate for private DG customers through a compliance filing at the conclusion of this docket.

Respectfully submitted,

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ATTORNEYS FOR
WESTAR ENERGY, INC.
KANSAS GAS AND ELECTRIC COMPANY

VERIFICATION

STATE OF KANSAS)
) ss.
COUNTY OF DOUGLAS)

Cathryn J. Dinges, being duly sworn upon her oath deposes and says that she is one of the attorneys for Westar Energy, Inc. and Kansas Gas and Electric Company; that she is familiar with the foregoing **Reply Comments**; that the statements therein are true and correct to the best of her knowledge and belief.

Cathryn Dinges
Cathryn J. Dinges

SUBSCRIBED AND SWORN to before me this 5th day of May, 2017.

Donna G. Quinn
Notary Public

My Appointment Expires: 8/28/2020

Donna G. Quinn
NOTARY PUBLIC–STATE OF KANSAS
MY APPT EXP: 8/28/2020

CERTIFICATE OF SERVICE

I hereby certify that on this 5th day of May, 2017, the foregoing **Reply Comments** were electronically served on all parties of record.

Cathryn Dinges
Cathryn J. Dinges

Reply Affidavit of Jeff Martin
Docket No. 16-GIME-403-GIE

I. Introduction

My name is Jeff Martin and I am same person who filed an Affidavit in Support of Westar Energy, Inc.'s (Westar) Initial Comments in the above-referenced docket. The purpose of my Reply Affidavit is to provide Westar's overall response to the initial comments from other parties in the docket and to address, more specifically, initial comments regarding (1) whether a separate, differentiated rate schedule is appropriate for residential customers with private distributed generation (DG), (2) whether the Commission should act now to correct the subsidy that exists from non-DG customers to private DG customers or whether there is some reason for delay, (3) what the appropriate rate structure is to correct the existing subsidy, and (4) whether the Commission should consider any alleged "benefits" of private DG when setting rates.

II. Westar's Overall Response to Initial Comments

Westar was pleased to see that a majority of the commenting parties agree on many of the issues to be decided in this docket and have offered constructive solutions for the Commission to consider when working to correct the subsidy that currently exists from non-DG residential customers in favor of customers with private DG. The majority of the parties filing comments in the docket – Staff, Citizens' Utility Ratepayer Board (CURB), Kansas City Power & Light Company (KCP&L), Empire District Electric Company (Empire), Midwest Energy, Inc. (Midwest), Sunflower Electric Power Corporation and Mid-Kansas Electric Company, LLC (Sunflower), Southern Pioneer Electric Company joined by the Kansas Electric Cooperatives (Southern Pioneer and KEC), and Westar – agree that the current rate structure for private DG customers is not cost-based and creates a subsidy from non-DG customers in favor of private DG customers. The majority of the parties – Staff, CURB, KCP&L, Empire, Southern Pioneer and

KEC, Sunflower, and Westar – also agree that private DG customers should be placed in a separate rate class and many of the parties – Staff, KCP&L, Midwest, Sunflower, and Westar – believe that the use of a three-part rate with a demand charge would help to correct the inequities in the current rate structure. The exceptions to this are Cromwell Environmental, Inc. (Cromwell), Climate + Energy Project (CEP), United Wind, Inc. (United Wind), and Brightergy, LLC (Brightergy). However, none of these parties offer any substantive basis that justifies continuation of the current, non-cost-based rate structure for private DG customers. Instead, they simply argue that the Commission should continue to study the issue and delay any action that would correct the existing problems. As discussed below and in the Reply Affidavits of Dr. Ahmad Faruqui and Ashley Brown, there is no need for the Commission to delay taking action on this issue. Instead, acting now will likely help foster the long-term development of DG, including private solar.

III. A separate and differentiated rate schedule is needed for private DG customers

As I indicated in my Initial Affidavit, private DG customers are partial requirements customers of the serving utility – intermittently generating some or all of (and potentially, more than) their energy needs while relying on the serving utility for some or all of their requirements when their systems are not producing sufficiently (e.g., cloudy days and at night). DG customers also rely on the serving utility's facilities when they use the electric system to sell private DG production in excess of their energy needs. Because of the way that two-part rates are designed – with a large portion of utility fixed costs being recovered through the variable component of a customer's bill – when private DG customers generate electric energy with their resources and reduce their consumption of energy generated by the serving utility, they also avoid paying for a portion of the fixed and already incurred costs associated with generation, transmission, distribution and customer service, even though they continue to rely on some or all of those

systems. This results in a cross-subsidy from non-DG customers in favor of customers who can afford to install private DG at their homes. For all of these reasons, Westar – and a majority of the commenting parties – have concluded that private DG customers should be placed in a separate customer class and charged a rate that is more cost-based than what they are charged today.

Midwest argues that private DG customers should not be placed in a separate rate class and, instead, utilities should make rates for **all** residential customers more cost-based by the use of a three-part rate. Westar agrees that rates for all residential customers could be made more cost-based by use of a three-part rate because the current two-part rates are mismatched with how Westar and other utilities actually incur costs. However, Midwest's suggestion is beyond the scope of this docket. The purpose of this docket is to address rate design only for private DG customers and Westar has focused on that issue. Additionally, as Dr. Faruqui and Mr. Brown discuss, there is clear justification for separation of customers with private DG into a separate rate class. They have a different load profile than customers without DG and they are also generating their own power and – at times – sending it to the grid, unlike other residential customers. The fact that rates could be improved for all residential customers does not change the conclusion that customers with private DG should be in a separate rate class.

United Wind argues that a separate rate class for all customers with private DG is not appropriate because wind resources can actually help reduce peak demand and because wind DG resources have a different load profile than solar. However, as Mr. Brown discusses, private DG customers with wind resources are still partial requirements customers and any reduction in the customer's peak that occurs due to a wind resource would be recognized through a three-part rate with a demand charge. In fact, most – if not all – of United Wind's customers are rural agricultural businesses who are commercial customers (not residential customers) and who are presumably

already paying a three-part rate. Westar's proposal in this docket would have no effect on these customers. Additionally, as Mr. Brown points out, in Westar's case, generation from wind resources does not occur in appreciable amounts during high demand periods in the summer.

IV. There is no reason to delay acting to make rates for customers with private DG more cost-based and to correct the unreasonable subsidy that currently exists from non-DG customers to customers with private DG

Cromwell, CEP, United Wind and Brightergy argue that the solar industry is in its infancy and, as a result, may be more sensitive to regulatory changes. They also suggest that Kansas does not yet have a significant number of DG resources so there is no need to act quickly to address the problems existing with rate design for customers with private DG. Dr. Faruqui and Mr. Brown explain that the costs of private solar have decreased significantly, confirming that the industry is not really in its infancy.[1] This price decrease is confirmed by the initial comments filed by Cromwell and CEP. This is the perfect time to address the issues that exist as a result of the current rate design for customers with private DG. All of Westar's customers who have installed private DG since October 2015 have been placed on the separate Residential DG Tariff as ordered by the Commission and will not be grandfathered to an old rate when the rate design for customers with private DG is established.[2] Since October 2015, the number of customers with private DG on Westar's system has grown from about 250 to over 500. These customers and any new customers with private DG added in the future all face uncertainty with respect to the rate they will pay for

[1] Despite this fact, private DG customers continue to get a 30% income tax credit on their federal income taxes, which is a large incentive to keep the solar industry growing.

[2] Under the settlement agreement approved by the Commission in the 15-115 Docket, DG customers that had installed and connected their DG systems to Westar's system prior to October 28, 2015, are grandfathered under the "Residential Standard Service" tariff; however, DG customers who install and connect their DG systems on or after October 28, 2015, take service under the "Residential Standard DG" tariff and will be impacted by any tariff change that is implemented as a result of this docket.

electric service in the future. This lack of clarity reduces the ability of customers considering installing private DG to make an economic evaluation of the investment and on solar installers' ability to make sales. Providing clarity with respect to the rate design now will give clarity to those customers considering investing in solar and should help encourage further growth of that industry in Kansas. Additionally, only about 250 customers – those who have installed private DG and connected to Westar's system since October 2015 – will be impacted by a rate design change now. That number of impacted customers will continue to grow the longer the Commission waits to make a change.

V. A three-part rate with a demand charge is the appropriate rate structure for private DG customers.

As I indicated in my initial affidavit, a three-part rate for private DG customers will modernize the current rate design to better match fixed charges to fixed costs and variable charges to variable costs, thereby reducing or eliminating the cross subsidy from non-DG customers to customers with private DG. Staff, Sunflower, and KCPL all support the use of a three-part rate with a demand charge for customers with private DG. Several other parties agree that the rate paid by customers with private DG needs to be adjusted but make different suggestions regarding rate structures that would help address the existing problems. Cromwell, CEP, and Brightergy do not address any rate design options substantively and instead argue that the Commission should take more time to study possible rate design options and delay implementation of any new rate design.

In response to Cromwell's, CEP's, and Brightergy's suggestion that the Commission should delay any change and conduct a Kansas specific study, Dr. Faruqui and Mr. Brown explain that a Kansas specific study is not going to change the conclusion that a three-part rate with a demand charge is appropriate for private DG customers because the factors on which this

conclusion is based are not state specific. No study is required for the Commission to take steps to mitigate the existing cross subsidy and implement a rate design change such as the three-part rate proposed by Westar. The notion of a study is based on the argument that there should be a study of the "value of solar," a concept that is not directly relevant to a rate design change, but rather seeks to ascribe value to private DG in excess of the value of the generation utilities can provide to their customers at utility scale. It would be discriminatory for the Commission to consider the value of one type of generation resource available to serve customers – private DG – but not consider the value of all other resources the utility has to serve customers, including utility-scale renewable generation. Additionally, customers have the right to receive a just and reasonable cost-based price for their energy and should not be required to pay more for one type of resource, which is valued using a method that is not being applied to any other utility resources.

Several parties suggest alternative rate designs, such as access charges or stand-by charges, that might help address the existing cross-subsidy and make rates for customers with private DG more cost-based. While Westar does not object to these approaches as they certainly achieve a similar end of removing or reducing the cross subsidy, we prefer the three-part rate with a demand charge because we believe it is the most appropriate solution today.[3] We are flexible in the actual design of a three-part rate and will continue working with the other parties to create a structure that works to eliminate the current cross subsidy.

[3] Dr. Faruqui and Ryan Hledik of The Brattle Group discuss the strengths and weaknesses of the various rate design options in the presentation attached hereto.

VI. Claimed Benefits do not Justify the Subsidy to Private DG Customers at the Expense of non-DG Customers

As I discussed in my initial affidavit, any alleged benefits of private DG are either de minimis, not quantifiable, or not distinguishable from the benefits provided by utility scale renewable resources. As a result, any alleged value of solar should not be considered in the ratemaking process. Staff agrees with this conclusion and explains that a three-part rate will effectuate consideration of any relevant benefits because the demand charge will reflect in the DG customers' bill any reduction in the customer's demand achieved through use of private DG.

Several of the parties argue that societal benefits are important to value in order to compensate customers with private DG properly. As Westar explained in its Initial Comments, consideration of societal benefits in the ratemaking process is inconsistent with previous Commission orders where the Commission indicated it would not consider the value of externalities because they were very difficult to quantify. It would also be inconsistent with the Commission's treatment of all other generating resources. Although utility scale renewables provide the same societal benefits that renewable DG provides, the Commission has never allowed an adder for the value of societal benefits to the cost of renewable generation constructed by a utility. In fact, as Westar indicated in its Initial Comments, the Commission expressly denied such an adder – despite the fact that it is contemplated by Kansas statute – when requested by Westar for the first set of wind farms we constructed. The most reasonable, non-discriminatory approach for the Commission to take in this docket is to treat all resources the same and exclude consideration of societal benefits from the ratemaking process.

Cromwell, CEP, Brightergy, and United Wind also argue that the Commission should conduct a Kansas specific study to determine the "value of solar." Those parties also have the

option of presenting their own study in this docket and not asking the Commission and its Staff to carry the burden of the time and cost related to such an undertaking. However, as I indicated above, modernizing the rate design for customers with private DG does not require a study, or a determination of the "value of solar." The cross-subsidy can be mitigated and better cost transparency achieved by reallocating the costs of the current two-part rate to a three-part rate design that includes a demand charge – as was recommended by several parties including Commission Staff. Additionally, as Mr. Brown discusses, value of solar studies have been shown to be highly subjective with the results being very predictable based on the author of the study. To the extent the Commission wishes to consider any "value of solar" factors, data is available from a number of other sources including a variety of studies, federal data on sun exposures, and solar production estimating tools. To the extent the Commission decides there is a reason to treat private DG resources differently from utility scale renewable resources and consider their value, the Commission can make its determination of value utilizing these existing resources.

Rather than further delaying taking steps to correct the cross-subsidy, Westar recommends that the Commission leave customers with private DG in a separate class and establish a more cost-based rate for those customers at this time. In each future rate case, the utilities will conduct and file a class cost of service (CCOS) study, with private DG customers separated into their own class, and all intervening parties will have the ability to study the data and substantiate their own positions and conclusions. A CCOS study is a very detailed, specific study that will capture all measurable costs and benefits of the DG class without substantial additional cost and without further delay. If a meaningful level of costs or benefits do become quantifiable in the future, subsequent CCOS studies will reflect this and the rate design implemented in each rate case can change over time as the class changes.

A Comparison of DG Rate Design Options

PREPARED FOR

Westar

PREPARED BY

Ahmad Faruqui
Ryan Hledik

April 10, 2017

THE Brattle GROUP

DG rate design options

Several rate design elements are commonly considered in initiatives to reform rates for residential DG customers.

Demand charge: A charge based on a customer's maximum kW demand over a specified time period – typically the monthly billing cycle

Fixed charge: Westar's current rate already includes a fixed monthly charge. The fixed charge could be increased to more fully recover fixed- and demand-related grid costs.

Capacity charge: A charge can be levied based on the installed capacity of a DG system. The result is an additional fixed monthly charge for DG owners, with the size of that charge being determined by the customer's generation capability. One-time capacity charges are sometimes referred to as interconnection charges.

Minimum bill: The minimum bill ensures that all customers will pay a minimum threshold amount each month. For instance, with a minimum bill of $50/month, a customer whose bill would have been $30 under the existing rate for a given month would be billed $50 for that month. The minimum bill does not apply if the customer's bill exceeds the threshold.

Time-of-Use (TOU) volumetric charge: The variable charge can be modified to include time-differentiated prices, with a higher price being charged during on-peak hours and a lower price during off-peak hours, reflecting the corresponding variation in utility capacity and energy costs by on-peak and off-peak periods

Evaluating the DG rate design options

	Strengths	Weaknesses	Incentive for efficient consumption	Cost reflectivity of price signal	Simplicity of design	Revenue adequacy
Demand charge	Significant improvement in representation of grid costs, provides strong incentive for price response	Will require customer education; may require new billing system, depending on design	4	3	3	3
Fixed charge	Ensures fixed cost recovery, reflects sunk grid investment costs, simple to understand	Does not account for individual customer grid usage, provides no signal for peak demand reduction	1	2	4	4
Capacity charge	Similar to fixed charge, with added benefit of being more closely tied to magnitude of customer's need for backup from grid	Similar to fixed charge	1	2	4	4
Minimum bill	Ensures some fixed costs are recovered from customers with extremely low usage	Very unlikely to provide sufficient fixed cost recovery; shares other disadvantages of fixed charge	1	1	4	1
TOU	Provides price signal to reduce peak demand; improvement in represenation of generation costs	Price signal can only reflect coincident peak period and does not capture customer max demand; volumetric charge is less likely to provide full cost recovery than demand charge	4	3	3	2

4 = Strong
3 = Good
2 = Modest
1 = Weak

Notes:

Table represents advantages of moving from a flat volumetric rate for DG customers to a rate which incorporates the design elements shown. Assessment assumes rate design elements are incorporated in isolation. Design elements could be offered in combination to achieve greater benefits (e.g. demand charge to recover grid costs and TOU charge to recover generation costs). There are many ways to design a rate and scores shown are subject to design of each element; relative scores could vary depending on the specific design choices that are made.

An additional DG compensation option: Buy-all/sell-all

Aside from changing the rate design, a separate option being considered in some jurisdictions is the "buy-all/sell-all" approach

With this approach, consumption and DG output are metered separately. Customers pay the retail rate for all of their consumption and are separately paid for their DG output at a rate that is considered to reflect the value of the solar output. There is no agreement on how to measure the latter. This is akin to setting a feed-in tariff for distributed generation and comes with all the attendant issues and controversies.

Strengths

- Can address the DG cross-subsidy without changing the structure of the retail rate
- Can be transparent
- Cost-based (when well designed)

Weaknesses

- Does not explicitly include an incentive for peak demand reductions and economically efficiency electricity consumption
- Establishing the payment for DG output is often a contentious exercise; the payment can become exaggerated through inclusion of compensation for externalities

Demand charge design: coincident peak versus non-coincident peak

There are many ways to design a demand charge, but the vast majority of existing residential demand charges fall into two categories

Non-coincident peak (NCP): The demand charge is based on the customer's maximum demand over the entire billing cycle. Thus, the demand measurement could occur on any day, at any time. This is sometimes also referred to as the customer's "billing demand."

Coincident peak (CP): Demand is measured only during peak hours of the day (e.g. 2 pm to 7 pm on weekdays). The demand charge is based on the maximum demand measured during these hours over the course of the billing cycle. The peak period is defined to align with the hours that drive the capacity costs that are being recovered through the demand charge. Sometimes maximum demand is computed daily and averaged over the month.

Relative advantages of each demand charge design option

NCP demand charge

- The most common form of a residential demand charge
- Most appropriate for recovering distribution grid costs, which are local in nature and more directly tied to an individual customer's maximum demand
- Would not require billing system upgrade since this is the design of Westar's current Peak Management rate

CP demand charge

- Most appropriate for recovering costs related to system peak demand, such as generation and transmission capacity
- Provides a predictable window of time for customers to manage demand
- Peak period accounts for residential demand diversity by establishing demand charge based on a measure of class or system peak

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the General Investigation to Examine Issues Surrounding Rate Design for Distributed Generation Customers.	)))	Docket No. 16-GIME-403-GIE

REPLY AFFIDAVIT OF JEFF MARTIN

STATE OF KANSAS)
) ss.
COUNTY OF SHAWNEE)

Jeff Martin, being first duly sworn on his oath, states:

1. My name is Jeff Martin. I am the Vice-President, Regulatory Affairs for Westar Energy, Inc.

2. Attached hereto and made a part hereof for all purposes is my Reply Affidavit on behalf of Westar Energy, Inc. having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that the information contained in my Reply Affidavit is true and accurate to the best of my knowledge, information and belief.

Jeff Martin

Subscribed and sworn before me this 1st day of May, 2017.

Donna G. Quinn
Notary Public

My Commission expires: 8/28/2020

Donna G. Quinn
NOTARY PUBLIC—STATE OF KANSAS
MY APPT EXP: 8/28/2020

Reply Comments of Dr. Ahmad Faruqui in Kansas Generic Docket on Distributed Generation Rate Design

PREPARED ON BEHALF OF

Westar Energy

May 5, 2017

THE Brattle GROUP

Table of Contents

I. Introduction

I previously filed comments in this proceeding on behalf of Westar.[1] I am now submitting my reply comments which address some of the direct comments made by intervenors in this proceeding. Specifically, I am responding to comments made by Brightergy, The Climate+Energy Project (CEP), Cromwell Environmental, and United Wind.

My reply comments are organized around the following four points:

- It is appropriate to create a three-part rate specifically for DG customers
- A "Value of Solar" study is not a necessary prerequisite for proceeding with DG rate reform
- A time-of-use (TOU) energy charge is not a substitute for a demand charge
- It is appropriate to change the DG rate design now

For the reasons discussed below and in my direct comments, I continue to support Westar's proposal to create a three-part rate structure for residential distributed generation (DG) customers in its service territory.[2]

II. It is appropriate to create a three-part rate specifically for DG customers

Cromwell Environmental states that it is premature to develop separate rates for DG customers.[3] Cromwell's support for its statement is a suggestion that DG customers have load profiles that are as diverse as those of other utility customers.[4] There are several problems with this assertion.

Cromwell's general statement about DG customer load diversity does not account for the fact that DG customers are truly distinct from non-DG residential customers and have a different associated cost of service than other residential customers. I discussed these characteristics in my direct comments. The characteristics include a monthly load factor for DG customers that is significantly different from the residential class average, the regular export of electricity to the

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1 Affidavit of Dr. Ahmad Faruqui in Kansas Generic Docket on Distributed Generation Rate Design, prepared on behalf of Westar Energy, March 17, 2017.

2 My affidavit focuses specifically on customers with rooftop solar photovoltaic (PV) systems. Throughout my affidavit, I refer to customers with rooftop PV systems as DG customers.

3 Cromwell Direct Comments, page 7, para. 19.

4 Ibid., page 3, para. 10.

power grid, and volatile and intermittent energy needs. These are not characteristics that DG customers share with other residential customers.

Load diversity itself is not a reason to include or exclude customers from a rate class. Customers within any rate class will exhibit some degree of load diversity. Rate classes are created to account for the characteristics that are common to those customers and which drive the costs they impose on the system, in spite of load diversity. For instance, Westar offers the Small General Service, Medium General Service, and Large General Service rate schedules to differentiate commercial and industrial customers based on size. The customers within those classes exhibit load diversity, just as would customers in a residential DG class.

In making its point about load diversity, Cromwell provided data which highlights the problem associated with Westar's current two-part rate for DG customers which three-part rates are intended to address. Table 3 of the Cromwell filing shows a DG customer with lower consumption but the same peak demand as a non-DG customer.[5] That low load factor is a characteristic consistently shared by DG customers. By installing rooftop solar PV systems, DG customers reduce their total energy consumption but do little to change their maximum demand or system peak-coincident demand, and therefore largely do not reduce their dependence on the grid or the utility's installed generation capacity and its associated costs. A three-part rate would do a better job than the current rate of recovering these costs associated with that dependence.

By focusing only on monthly consumption and demand, the example provided by Cromwell in Table 3 of its direct comments masks an important distinction of DG customers.[6] It hides the fact that solar customers export electricity to the grid at times when the output from their PV system is greater than the demand for electricity in their homes. In some cases, this export level could even exceed the customer's maximum demand for electricity, thus increasing their need for grid capacity relative to a case where they had not installed rooftop PV. Cromwell's focus only on net monthly consumption hides this phenomenon, and is at the core of the problem with net metering with traditional two-part rates.

III. A "Value of Solar" study is not a necessary prerequisite for proceeding with DG rate reform

Several intervenors suggest that a Kansas-specific study on the value of solar (VOS) is needed before moving forward with DG rate reform.[7] While research can be helpful in understanding the costs and benefits of solar generation in Kansas, and helpful in integrated resource planning

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5 Cromwell Direct Comments, page 5, para. 13.

6 Ibid.

7 Cromwell Direct Comments, page 8, para. 20; Brightergy Direct Comments, page. 3; United Wind Direct Comments, page 3, para. 5; CEP Direct Comments, page 4.

studies, there are several reasons why a VOS study should not be viewed as being a prerequisite to transitioning to a three-part rate for DG customers.

Three-part rates are designed to reflect the utility's underlying cost structure. They account specifically for the costs that the utility is allowed to recover through rates, and nothing more. As such, Westar's cost of service study provides the foundation necessary to develop a three-part rate. There is no additional research or data that is needed to develop such a rate for residential DG customers.[8]

As I discussed in my direct comments, there is broad support for three-part rates in the academic literature on utility regulation.[9] Three-part rates recover costs in a manner that is economically efficient and fair, and they provide customers with an incentive to consume electricity in a way that will reduce their electricity bills and also reduce overall system costs. A new VOS study in Kansas will not change the underlying principles that support the transition to a three-part rate structure.

VOS studies themselves present a number of challenges that limit their overall usefulness in DG rate reform proceedings. First, studies on the costs and benefits of solar produce an extremely wide range of results, even within a single jurisdiction. In my direct comments, for instance, I cited 12 studies which found that the DG subsidy embedded in current rate designs around the U.S. ranges from $444 to $1,752 per DG customer per year. United Wind, in its direct comments, cited a Brookings Institute study which identified 10 studies to develop methodologies to value DG and net metering.[10] A study by The Rocky Mountain Institute which surveyed 15 VOS studies found that the benefits of rooftop solar range from significantly below to significantly above the average retail rate.[11]

This range of results from VOS studies can largely be explained by the fact that the studies are, for practical reasons, heavily dependent on many assumptions. Potential benefits such as avoided distribution costs due to possible peak demand reductions from solar PV, for instance, are often based on anecdotal information rather than on detailed engineering studies, which would be expensive and time-consuming. Other assumptions in the VOS studies are subject to similar uncertainty.

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8 Initially, I would recommend establishing a DG rate that is revenue neutral to the residential class as a whole. Over time, once sufficient data is available on the cost to serve DG customers, I would recommend establishing a cost allocation that is specific to that class of customers.

9 Faruqui Direct Comments, pages 12-13.

10 United Wind Direct Comments, page 3, para. 5.

11 Lena Hansen, Virginia Lacy, Devi Glick, "A Review of Solar PV Benefit & Cost Studies," prepared by Rocky Mountain Institute, September 2013.

One particular assumption that tends to drive differences in the conclusions of VOS studies is the assumed value of emissions reductions. The inclusion of this assumption is problematic for two reasons. First, assigning an appropriate value to avoided carbon emissions is fraught with controversy and is not something that the KCC has, thus far, elected to address. Second, assigning an environmental value to rooftop solar implicitly credits solar for this benefit without providing similar credit to other resources that could potentially provide the same benefit at lower cost. While rooftop solar certainly has the potential to reduce greenhouse gas emissions, other resources like utility scale renewable generation, nuclear generation and energy efficiency can also provide these benefits. Efficient gas-fired power plants provide these benefits relative to coal-fired units. The inclusion of externalities in an assessment of the value of solar would need to be accompanied by a similar assessment of the externalities associated with all other potential energy resources. It does not make sense to focus only on the externalities associated with rooftop solar.

The "value" of solar is in fact not particularly relevant in a discussion of the appropriate rate design for DG customers. Rates are designed to recover costs fairly and efficiently. They are not designed to reward customers for services that they provide outside of the utility's cost structure. A well-designed three-part rate will automatically reward customers in the form of bill reductions if they are able to reduce costs. For instance, a significant reduction in peak demand would decrease the long-term need for new investments in capital intensive infrastructure, which would be reflected in a reduced demand charge on the customer's bill.

Along these lines, many of the potential benefits of rooftop PV listed in CEP's direct comments would be captured through a three-part rate, if the DG customer is indeed able to provide them. These include avoided energy/fuel, energy losses/line losses, and avoided capacity.[12] Other cited benefits, such as reduced wear and tear on fossil generation assets, are not clear benefits at all. In fact, an increase in demand volatility and in load ramping in the evening hours resulting from the variability of DG generation could increase these costs, rather than decrease them, since it could put additional strain on the operation of the thermal units.

IV. A time-of-use (TOU) volumetric charge is not a substitute for a demand charge

Brightergy suggests that a TOU volumetric charge would be an appropriate alternative to a demand charge.[13] However, purely volumetric TOU rates have several disadvantages relative to three-part rates; disadvantages which are similar to those in the current two-part rate offering.

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[12] CEP Direct Comments, page 6.

[13] Brightergy Direct Comments, page. 4

There are three types of costs: customer-related, capacity-related, and energy-related. Volumetric TOU rates can capture the energy-related costs if they vary by time of day, by day of the week, by month, and by season. Customer-related costs are costs that are driven by the number of customers on the system and include costs related to providing metering, billing, and customer service (such as staffing of call centers) and they will sometimes also include the cost of installing the line drop from the nearest pole and sometimes also the cost of nearest pole transformer. Capacity-related costs consist of those costs that are related to distribution, transmission, and generation. Transmission and generation capacity are sized based on expected peak demand. Distribution costs are going to depend in part on the customer's connected load (which can be approximated by the customer's non-coincident demand) and the customer's peak demand at the time of the distribution system peak.

Thus, a rate based on a purely volumetric TOU charge would recover customer-related and capacity-related costs through a volume-based rate. Reductions in mere volume are still likely to result in unrecovered fixed costs that are redistributed in a utility's next rate case. Well-designed demand charges have the potential to more closely align the rate structure with the cost structure.

That said, volumetric TOU charges and demand charges can be viewed as complements rather than substitutes. TOU rates are most appropriately used to reflect the time-variation in the cost of energy. They are rarely used to reflect time-variation in the cost of the grid (demand). An economically efficient rate would capture the costs of the grid with demand charges and the costs of energy with an energy-based time-of-use rate. This is fairly standard practice in the industry for commercial and industrial customers. The primary barrier to doing this for residential customers historically has been a lack of the necessary metering infrastructure. However, with the rollout of smart meters and the common requirement that DG customers require a separate meter, that barrier is no longer applicable in DG rate reform.

V. It is appropriate to change the DG rate design now

Several intervenors have suggested that current low levels of rooftop solar adoption in Westar's service territory are reason to delay changes to the DG rate.[14] In fact, the opposite is true.

There are significant benefits to correcting the DG rate design before rooftop PV is adopted in larger numbers. At limited levels of adoption it is easier to address issues such as grandfathering of existing DG customers into the current DG rates policy. The impacts of grandfathering on

[14] Cromwell Direct Comments, page 1, para. 2; United Wind Direct Comments, page 4, para. 7; CEP Direct Comments, page 5.

customers - and the contentiousness of the issue - grow as more customers adopt rooftop PV.[15] The same also applies to customer education. It is easier to educate customers about their rate options when the vast majority are in a similar situation rather than when they have become bifurcated.

Correcting the DG rate design now also provides more certainty to customers who may be considering investing in rooftop PV. For the various reasons I discussed in my direct comments, net metering with flat volumetric rates is not sustainable and will require a change to the DG compensation mechanism. This inevitable change is occurring in other jurisdictions throughout the U.S., where net metering policies are being ended (e.g., Arizona, Hawaii) and/or the underlying DG rate structure is being modified (e.g., Nevada). Reforming the DG rate now will take some of the uncertainty out of the decision-making process for customers who are considering whether or not to invest in rooftop solar.

It is important to respond to some specific comments that intervenors made on this topic in their direct comments. United Wind cited a Lawrence Berkeley National Laboratory (LBNL) study, pointing to a conclusion in the study that the DG-related cost shift has a smaller impact on residential customer bills than other factors such as fluctuations in the price of natural gas.[16] The problem is that United Wind is taking the findings of the LBNL study out of context. LBNL compares the DG cost shift to several factors that are market driven (e.g., fluctuations in fuel prices, capital expenditures). However, the DG cost shift is an issue that needs to be actively addressed and corrected by regulators before it becomes a bigger issue. Whether or not the DG cost shift is small relative to swings in the price of natural gas is irrelevant – the fact remains that net metering with flat volumetric rates creates an unintended and hidden cross-subsidy that distorts price signals for residential customers. The cost shift will grow as solar installations grow and should be addressed while it is still practical and less disruptive to do so.

CEP similarly argues that the level and pace of adoption should influence the KCC's decision in reforming DG rates.[17] Cromwell states that the solar industry is in its "infancy."[18] While the market penetration of rooftop solar may currently be low in Westar's service territory, I would not agree with the characterization of the rooftop solar industry as a newly emerging industry. In fact, SolarCity (a well-known, established national rooftop solar developer) was recently acquired by Tesla at a price tag of $2.6 billion. Rooftop PV costs have come down significantly over the last several years as noted by several parties in this case, and the solar industry has

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[15] In the case of Westar, the Commission has already proactively addressed the grandfathering issue in Westar's most recent rate case.

[16] United Wind Direct Comments, page 3, para. 5. and Barbose, G., "Putting the Potential Rate Impacts of distributed Solar into Context," LBNL January 2017.

[17] CEP Direct Comments, page 4.

[18] Cromwell Direct Comments, page 1, para. 3.

grown at the same time. The number of DG installations in Westar Energy's service area, while limited, has doubled since the filing of the 2015 rate case. In addition, the federal government continues to subsidize solar installations by providing homeowners with a 30% tax credit.

A point argued by Cromwell is that the 1% net metering participation cap in Kansas will limit the negative consequences of net metering with flat volumetric rates.[19] However, implicit in this statement is an assumption that the participation cap is firm. In fact, as participation has approached these caps in other states, the caps have consistently been raised to accommodate additional participation. This "cap inflation" trend is illustrated in a 2014 study by the National Renewable Energy Laboratory (NREL).[20] Figure 1 below is excerpted from the NREL study and illustrates the persistent increase in the participation cap among existing state net metering policies. Note the caption to the figure, which states that "*caps, once instituted, have always increased over time*."

[19] Cromwell Direct Comments, page 1, para. 2. It is worth pointing out that the existence of a participation cap itself is an implicit acknowledgement that net metering policies are not sustainable.

[20] Heeter, J., et al., "Status of Net Metering: Assessing the Potential to Reach Program Caps." NREL September 2014.

Figure 1: NREL Analysis of Net Metering Program Cap Inflation

2.1 Program Caps Have Increased Over Time

Many PUCs and state legislatures have modified net metering program caps over time. In the early 2000s, program caps were generally at 1% or less of peak demand, while today, a much wider range of program caps exist, with a number of caps at 5% of peak demand or more (Figure 3). Although states define program caps in numerous ways, Figure 3 shows that caps, once instituted, have always increased over time. In addition, a number of states that had policies initially without caps have instituted them over time. Text Box 3 highlights a number of recent efforts to expand net metering program caps; other ongoing efforts to limit net metering have focused on how net metered systems are compensated, rather than on the program cap. For example, Arizona Public Service in 2013 proposed adding a fixed fee to net metered customers' bills. Kansas and Oklahoma enacted legislation in 2014 that could add charges to net metered customers' bills (H.B. 2101 and S.B. 1456, respectively).

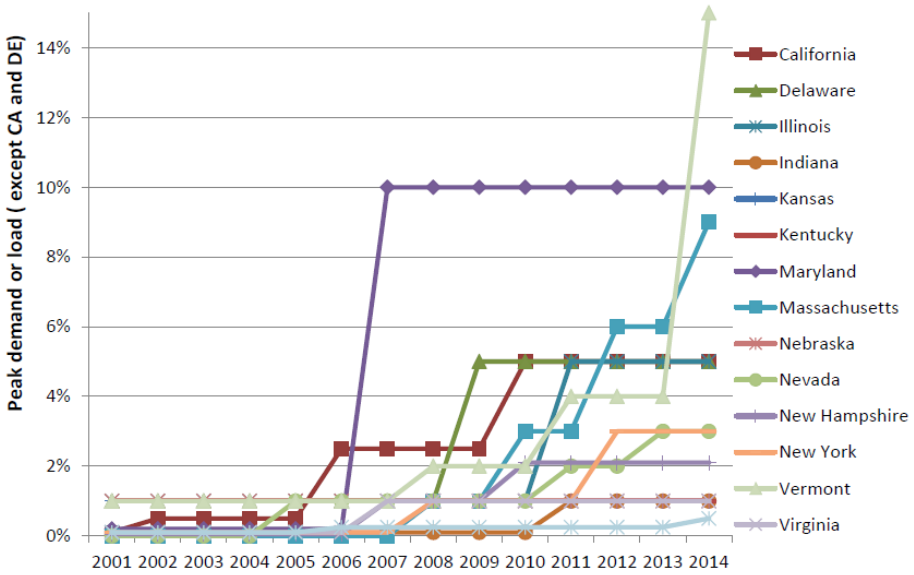

Figure 3. Major revisions to net metering program caps, 2001–2014

Source: J. Heeter, R. Gelman, L. Bird, "Status of Net Metering: Assessing the Potential to Reach Program Caps," September 2014.

Massachusetts is a state where the net metering cap was recently raised and serves as a useful case study for highlighting the cap inflation issue. In 2008, Massachusetts passed the Green Communities Act which established an official net metering incentive with an installed cap of 1% of a utility's peak load.[21] In recent years, as the economics of distributed PV have improved, the state legislature has made continued revisions to their caps to meet the increased solar penetration. In August 2014, the MA senate passed bill 2214 which increased NEM caps from 6%

[21] Heeter, J., et al., "Status of Net Metering: Assessing the Potential to Reach Program Caps." NREL September 2014, page 10.

to 9%.[22] These caps were quickly reached as one utility hit the new cap in the spring of 2015, just months after the cap was raised. In response, Governor Charlie Baker signed a bill on April 11th 2016 which increased the total cap to 15%.[23] Some see the increase of caps as a short-term fix where a longer-term net metering reform is needed. In Massachusetts, the cap has been raised a total of four times in the past seven years without significant changes to the incentive structure.

A second example of a state that has increased the net metering cap many times in recent years is Vermont. In 1997, the Vermont legislature passed H.605 which allowed net metering in Vermont and set an initial 1% cap on installations. In the past ten years, Vermont has increased the cap three times. The cap increased dramatically in the spring of 2014 when the Vermont House passed H 702, which increased the net metering cap from 4% of retail peak load to 15% of retail peak load. Before the passage of this cap increase, Vermont had filled 92% of its state-wide cap. In spite of this increase, however, with the rapid growth of distributed PV, Vermont quickly brushed up on its new caps. While it was originally expected that Vermont would reach the cap again sometime in 2019, it has been reported that one utility had already reached its cap by late 2015 with more caps triggered in 2016.[24,25] These results led to additional action by policy makers who redesigned the incentive program and eliminated the cap entirely in 2017.[26]

Given the soft nature of the net metering caps, it is not sufficient to simply assume that Kansas's cap will limit the impacts of the DG cost shift in the future. The experience of other states suggests that there will be political pressure to raise the cap. Rather than propagating an inefficient compensation mechanism through flat volumetric rates, it makes sense to redesign DG rates in a manner that reflects underlying system costs.

VI. Conclusion

As I discussed in my direct comments and in these reply comments, net metering with flat volumetric rates amounts to an outright subsidy from non-DG customers to DG customers. The aggregate subsidy will grow as the number of DG customers grows, encouraged by the subsidy. A transition to three-part rates for DG customers would address this issue and ensure that costs are being recovered from customers in a way that is equitable and cost-based.

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22 Massachusetts set different caps for the public and private sector. The percentages reported here include the total statewide cap.

23 See: http://www.masslive.com/politics/index.ssf/2016/04/gov_charlie_baker_signs_solar.html

24 Heeter, J., et al., "Status of Net Metering: Assessing the Potential to Reach Program Caps." NREL September 2014, page 17.

25 See: http://www.pressherald.com/2015/10/25/after-rapid-growth-vermont-close-to-net-metering-energy-cap/

26 See: http://programs.dsireusa.org/system/program/detail/41

The purpose of introducing three-part rates is not to "hurt" the rooftop solar industry but to remove distortions in the price signal and provide customers with an incentive to manage their electricity consumption in an efficient manner. Whether or not to subsidize residential rooftop solar is a decision for the KCC. However, such subsidies, if they are provided, should be transparent and should happen outside the rate design for energy, generation capacity, transmission, distribution and customer service provided by the utility (an example of this is the federal income tax credit which at 30% represents a large and significant incentive for customers to install DG). The purpose of rates is to accurately reflect the underlying cost structure and, accordingly, Westar's proposal to introduce a three-part rate represents a significant improvement in DG rate design.

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the General Investigation to Examine Issues Surrounding Rate Design for Distributed Generation Customers.	)))	Docket No. 16-GIME-403-GIE

REPLY AFFIDAVIT OF AHMAD FARUQUI

STATE OF California)
) ss.
COUNTY OF San Francisco)

Ahmad Faruqui, being first duly sworn on his oath, states:

1. My name is Ahmad Faruqui. I am a Principal with The Brattle Group.

2. Attached hereto and made a part hereof for all purposes is my Reply Affidavit on behalf of Westar Energy, Inc. having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that the information contained in my Reply Affidavit is true and accurate to the best of my knowledge, information and belief.

Ahmad Faruqui

Subscribed and sworn before me this 2nd day of May, 2017.

Notary Public

My Commission expires: 08/14/2017

EZEQUIEL VILLALOBOS
Commission # 2034751
Notary Public - California
San Francisco County
My Comm. Expires Aug 16, 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of San Francisco
Subscribed and sworn to (or affirmed) before me this 2 day of May, 2017, by Ahmad Faruqui, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

Signature _____ (Seal)

Reply Affidavit Ashley C. Brown

Docket No. 16-GIME-403

May 2017

Introduction

My name is Ashley Brown and I am the same person who filed an Affidavit in Support of Westar Energy, Inc.'s (Westar) Initial Comments in the above-referenced docket. The purpose of my Reply Affidavit is to address, more specifically, initial comments regarding (1) whether a separate, differentiated rate schedule is appropriate for residential customers with private distributed generation (DG), including wind customers, as well as solar customers; (2) whether the Commission should act now to correct the subsidy that exists from non-DG customers to private DG customers or whether there is some reason for delay, (3)whether there is a need for a Kansas-specific study to address the "value of solar" for Kansas; (4) the limitations of "value of solar" analysis generally; and (5) how a three-part rate is in the long-term interest of the development of distributed generation in Kansas.

Benefits of three-part rates: Does this mean they should be used for all customers?

As provided in the Commission's Order opening this docket, the scope of this generic docket is limited to residential DG rate design for partial requirements customers, therefore my comments in response to this question are intended to be general in nature and responsive to Midwest Energy's initial comments.

One perspective on three-part rates which, because of the carefully defined scope of the docket I did not address in my original comments was raised by Midwest Energy in its initial

comments. Midwest suggests that three-part rates should be used for all customers, as a means of most accurately reflecting and charging for the cost of service to each customer. Midwest notes that they collect "significant fixed costs via a variable charge," (6) and suggests that this leads to improper price signals for all customers, suggesting "rate designs for residential customers that can incorporate time and demand elements in addition to total kilowatt-hours used." Although my testimony does not address the broader issues as to whether three part tariffs should be applicable to all residential customers, the fact that Midwest raised those questions does highlight the importance of laying out why applying three part tariffs is critical in regard to the subset of customers to whom this docket is applicable, namely, DG customers.

Two points are worth making here about why a three-part rate is urgent for DG customers who are, unlike non DG customers, effectively, partial , rather than full requirements customers. First, as I explained in greater detail in my original testimony, and as Dr. Faruqui explains in his testimony, in volumetrically recovered rates, much of the cost of providing service to a partial requirements DG customer is left uncovered by those for whom the costs were incurred. Such a customer might have a very low net usage, but a high peak demand during sunset hours (for example), resulting in a high cost to serve that customer that is not captured under a traditional rate structure. DG customers, under volumetrically defined rates, are not paying their full share of the fixed and demand costs they impose on the system, despite the fact that their self-generation does nothing to reduce the fixed and demand charges the utility incurs for serving them. The three-part tariff proposed in this docket resolves that problem, because DG customers will pay their fair share of fixed and demand charges, thereby ending the practice of shifting the burden for paying those revenues to non-DG customers.

Second, contrary to the contention that paying a three-part tariff is too burdensome and complex to impose of solar DG customers, it is reasonable to expect that DG customers may be especially capable of responding to such a three-part rate. In discussing the possibility of a three-part rate, concerns are typically raised that the average residential customer cannot understand demand charges or cannot respond to demand charges. Regardless of whether one accepts those concerns for the average residential customer, neither concern should be applicable to a partial requirements DG customer. First, DG customers are more knowledgeable about energy efficiency, energy production, and kW versus kWh than the average residential customer, because DG customers have made a conscious decision to not only generate their own power, but also to commit very substantial amounts of money into controlling their expenses for electricity. A critical element of that decision was selecting the kW size of the system. Second, the greater degree of knowledge of DG customers regarding energy and demand also provides them with the knowledge and ability to modify their consumption patterns so as to moderate energy demand in response to a demand charge. In addition, the DG system itself provides a form of hardware that enables the partial requirements customer to shift demand (e.g., pre-cooling) or offset demand (e.g., confining use of all resistance heating equipment to periods when DG is producing) on the utility system. Finally, while the cost of demand management hardware may be a valid concern for many customers, DG customers have already demonstrated the financial ability to procure hardware options when they purchased or leased their DG systems. Hardware for moderating demand is available at a much lower cost than the life-cycle cost of an average PV system.

Again, the focus on partial requirements DG customers in this docket is appropriate because the case to make the change is based on the subsidy that results from the difference between consumption patterns of DG and non-DG customers. Whether or not a three-part rate for non-DG customers is appropriate is a less pressing question, because traditional, volumetrically based, rate designs do not create, or have the same potential to create, cross subsidies that add to the burdens non-DG customers would have to bear under the status quo.

Distributed Generation from Wind: Would the same three-part rate work for both wind and solar?

The comments of United Wind add an interesting wrinkle to my discussion of three-part rates for rooftop solar partial requirements customers. As Jason Kaplan, commenting on behalf of United Wind, Inc., points out, in the Kansas context, wind may play a significant role in distributed generation. Kaplan goes on to argue that wind "provides load leveling and peak shaving opportunity…as wind energy in Kansas…increases in strength in the evening hours, as solar PV ramps down due to the setting sun."

While I have not personally examined daily wind production patterns in Kansas, I will, for the purposes of this discussion and the purposes of this affidavit, assume here that Mr. Kaplan is correct in what he says about wind's peak shaving potential. This is potentially interesting for utility planning purposes; however, it does not, absent some very compelling evidence that I have not seen in this case, set DG wind customers apart from other DG partial requirements customers in a way that requires a separate class or rate. All distributed generation customers remain the same in the key respect that a rate that bundles fixed and

demand costs into a variable energy charge is likely to result in a failure to collect the cost of service to the customer. A three-part rate, with a fixed, demand, and variable component, is a significantly more accurate rate for these customers. If Mr. Kaplan is correct about the patterns of wind production versus those of solar, the bills of wind DG customers could well differ from solar DG customers under a three-part tariff, but that may well demonstrate why such a rate design is beneficial. That is because the good news for wind DG customers is that if it is in fact the case that wind generation will tend to offset the customer's peak demand, wind customers may stand to see a double savings under a three-part rate—not only a saving in terms of a reduction of volumetric kWh purchased, but a savings in terms of a lower demand charge, based on lower costs imposed on the system to meet the peak demand of customers with distributed wind power.

Questions of timing: Why act now?

Another claim in some of the comments has to do with timing. Both Cromwell Environmental and the Climate and Energy Project suggest that action is "premature," or at least not urgent, given the currently low penetration of premises-specific rooftop solar in Kansas.

The point here seems to be that whatever cross-subsidy exists cannot amount to much, in gross terms, since it is currently awarded to so few customers—therefore, the implication is, the state can wait to address relevant rate design issues until significantly more customers commit to private rooftop solar systems.

The argument that it makes sense to wait until a large number of customers are utilizing private DG before addressing a flawed rate should be rejected out of hand. The timing of good rate design is like the Chinese proverb about planting a tree—the best time to do it was 20 years ago; the second best time is now. All customers (including private rooftop solar customers and potential private rooftop solar customers) benefit from predictable, cost-based rates. Customers who install rooftop solar are making a large investment, and it is important to set rules that stabilize the long term, rather than changing the rules mid-stream. I can say, based on my experience in numerous states, that this discussion does not get easier or less controversial once many homeowners have made significant investments in private rooftop solar systems. Once that happens, the already difficult discussion of cross subsidies becomes even more complicated. The Commission and the parties are no doubt aware of the political ramification and the regulatory repercussions of this issue in other states. The argument also conveniently, and self servingly, ignores the fact that solar panel costs are in rapid decline, and the cross subsidy is clearly no longer appropriate, if, in fact, it ever was, in the face of the dramatically declining costs of solar. Kansas regulators should be commended in their foresight in setting this docket to deal proactively with these issues.

Questions of timing: Is rooftop solar in its infancy?

The initial comments of Cromwell Environmental state that the solar industry "Is still in its infancy, and consequently can be volatile, with disproportionate response to regulatory policy." (1) There are two parts to this statement, and it may be helpful to address them separately.

First, on the question of whether the rooftop solar industry is in its "infancy," the later comments of Cromwell Environmental itself and of Ms. Barnett from the Climate and Energy Project demonstrate that rooftop solar is not an infant industry in the sense the term is usually used. An "infant" industry is typically understood not yet to be widely deployed, and not yet to have realized the kind of cost savings available through mass production and the learning-by-doing available only through experience. There may be arguments for providing extra support to true infant industries with initial cost burdens to overcome to attain commercial viability. Such subsidies, if they are well advised at all, should never become permanent features of the marketplace. That not only creates price and market distortions, but also discourages efforts to boost efficiency, innovate, and attain full commercial viability. Rooftop solar is no longer an infant industry in this sense. Indeed, Cromwell and the Climate and Energy Project essentially make this very point when both state in their comments that the total installed price for residential PV has fallen dramatically since 2008 and that solar has become a significant source of employment across the country.

The second part of Cromwell Environmental's claim is that as a result of being an infant industry, rooftop solar "can be volatile with disproportionate response to regulatory policy." That, of course, may well be true, and rooftop solar industry's development in Kansas may respond to regulatory policy, but that is precisely why the regulatory policy should be driven by economic reality and future objectives of innovation and increased productivity and efficiency. Net metering, as I pointed out in my initial comments, was developed in an era when there were few alternatives for pricing DG and when solar costs were prohibitively high. Neither of those circumstances is reflective of today's environment, and rates designed for a decidedly

different economic environment have no relevance to today's formulation of regulatory policy. Market-based incentives for innovation and improvement, mindful of the current and evolving economics of DG, should drive today's regulatory policy. The appropriate focus should be on making solar energy a mainstream energy resource for Kansas' and the nation's energy needs, and not on short-term commercial interests of any particular parties. The long-term objective of moving solar energy into the mainstream is ill-served by antiquated pricing structures.

Questions of timing: Does the Kansas 1% cap protect Kansas electricity consumers from any significant cost related to rooftop solar cross-subsidies?

Cromwell Environmental's comments raise another issue I did not address in my initial comments—the existing Kansas legislative "cap" of 1% solar market penetration, after which utilities have the right to refuse connection. Dr. Faruqui also discusses this 1% cap at pages 6-8 of his reply affidavit. A few things are worth noting here. First, the Legislature's decision to impose a "cap" on the policy is itself an acknowledgement that a cost shift exists, that may only be tolerable if the number of beneficiaries is limited. Unfortunately, experience elsewhere has demonstrated that such "caps" on participants in subsidies rarely are sustained. Instead, intense political pressure is applied to raise such a cap once the limit is reached. Debates over raising the cap are almost always hotly contested and highly politicized matters. Thus, enforcing a cap is always very difficult, and leaves the regulatory arena vulnerable to political manipulation by parties seeking special treatment.

A "cap," then, is not a very effective way to protect non-solar consumers, as far as setting a real limit on the amount of subsidization of a given resource. Rather, a cap is a signal

of coming rate uncertainty. It is far better to have a proper rate structure, such as a three-part rate, that does not require a cap, because it is inherently just and reasonable, and, therefore, sustainable over time, no matter how many customers participate. If rates are set properly – imposing costs on cost-causers and eliminating subsidies – the level of market participation by solar will find its appropriate level without the need for artificial caps.

Are Kansas-specific studies needed to establish that a three-part rate would be appropriate for Kansas's distributed generation customers?

In arguing for the need for a Kansas-specific study, Cromwell Environmental lists several factors that might be expected to be distinct to Kansas: "amount of sunlight, diversity of generation capacity of affected utilities, state incentives or disincentives, wholesale market prices, fluctuations in fuel price and changes in the demand curve for each utility." It is important to point out that while all these factors might be very relevant to projections about the future expansion of solar in Kansas, none of these factors are relevant with respect to the rates the utility charges DG customers for its distribution, transmission, energy, demand generation capacity and customer services. To the extent the factors are relevant, they are relevant only to the regulator's determination of what other utility customers should be required to pay (as utility power purchase expense) for energy the utility is required to purchase from DG providers in lieu of purchasing or generating from another source. What Cromwell has enumerated are factors that drive results within a market design, but are irrelevant to the market design itself. In effect, Cromwell confused market design criteria with market outcomes. In fact, its comments reveal a mindset that is focused on the market outcome Cromwell desires – which reflects its partiality

and preference for specific outcomes (i.e., picking winners and losers) – rather than designing tariffs to promote productivity, innovation, and fairness to all participants.

Thus, for example, the amount of sunlight might be a very relevant consideration for a customer deciding whether to invest in solar. However, the economic and policy question at hand is how to fairly charge customers for the costs they impose on the system, while recognizing any actual savings to the utility provided by DG. A three-part rate can accomplish this, regardless of how much sunlight (much less sunlight specific to Kansas) is available. Conversely, wholesale market prices and fluctuations in fuel price will be reflected in the three-part rate itself, since these factors are embedded in the energy charge portion of the rate, or recoverable through an energy cost adjustment mechanism.

Is there a need for a Kansas-specific study to assess the "value of solar" for Kansas?

No. Among some of the comments that advocate for a Kansas-specific study, the reasoning is that there may be additional benefits provided by DG, beyond the energy benefits, that should be evaluated and compensated, and that these may have values particular to Kansas that need to be understood. It is important to note that Kansas is part of the SPP regional market, and the context of that regional market is much more relevant to many of the issues in this case than is any state specific study because the actual price of energy is established in the regional market within the SPP footprint, and that pricing does not vary when electrons cross state boundaries. Beyond that, one of the benefits of our federal system in the U.S. is that we can learn from the experiences in other states and not repeat mistakes that have already been made elsewhere. Most, if not all, of the issues being addressed in this matter are not unique to Kansas,

and, absent some demonstration that Kansas is truly unique in matters relevant to this case, no Kansas specific study is necessary in order to resolve the issues at hand.

More specifically, "value of solar" studies are unhelpful, whether undertaken as general exercises or with reference to a specific state. As I explained in my earlier comments, one problem is that many of the values proposed for solar (or other forms of distributed generation) are either imaginary or very dependent on specific circumstances (e.g., time of production, location of assets, resources being displaced, etc.) and hence not susceptible to generalized "value" analysis. For such a study to have any serious merit, it must have a very high degree of granularity, which, having read many "value of solar" studies, I have found to be completely lacking.

Beyond that, however, there is an even more fundamental problem, which is that some of the "values" may be available at a much lower price from other sources (for example, utility-scale solar and wind installations provide carbon-free electricity at much lower cost than private rooftop solar). Thus, the appropriate price to be paid for a given benefit (such as low or zero carbon emissions) should always be considered within the wider context of whether other resources might be able to offer the same values at lower cost. This kind of analysis, the critical market context, is notably absent from most, if not all, of the "value of solar" studies I have reviewed.

To give some examples, many of the "societal benefits" that are suggested for inclusion in value analysis of distributed renewable energy (usually private rooftop solar, but potentially also small-scale wind) need to be considered in this larger context. For example, the Climate & Energy Project comments mention "avoided criteria pollutants," "avoided CO2 emission cost"

and “other environmental factors,” as among the potential benefits that should be considered in valuing the benefits of DG in Kansas. Even making the hypothetical assumption that Kansas determines that all of these potential values, including externalities, are important and well worth ratepayer support, if reduction of CO2 and other pollutants is a significant objective (a decision that the state has not made), pursuing this objective through attributing additional value to rooftop solar energy is a highly inefficient and unnecessarily expensive approach. As discussed in more detail in my original comments, the most recent Lazard study of the comparative costs of different energy sources continues to show private rooftop solar as an order of magnitude more expensive as a means of carbon reduction than utility-scale solar PV or wind.[1]

Thus, a “value” approach to the societal benefits of DG that leads to traditional customers paying extra to purchase environmental benefits they could get much more cheaply elsewhere makes no sense. Those seriously concerned about climate change and air pollution ought to think hard about whether they risk exhausting the general public’s limited appetite to spend money on these issues if they channel that money disproportionately towards a technology which is extremely inefficient in addressing them, when much more cost effective measures are available. Unfortunately, “value of solar” studies (especially focused specifically on the value of distributed solar, as they often are) are generally structured so that the question of whether other, cheaper options are available does not come up.

To be clear, no societal adder has been allowed in past rate making in Kansas for utility-owned renewable generation (in fact, Westar made a request for such an adder – as allowed by

[1] See the discussion in my original comment, p. 36. The Lazard study referred to is *Lazard’s Levelized Cost of Energy Analysis – Version 10.0.*

statute - to support its construction of early wind farms, and was denied by the Kansas Corporation Commission). It may, however, on a purely hypothetical, conceptual basis, be worth considering how a policy maker or regulator might approach valuing or monetizing the environmental benefits of low carbon electricity in setting rates for energy resources. The external benefits being sought would have to be explicitly defined and the analysis would need to be designed in a way that is resource neutral, rewarding efficient reduction of pollutants, not privileging a specific technology. That is not at all what the solar advocates in this proceeding are seeking. Rather, they are asking for adders for private rooftop solar only, regardless of the fact that it is a more expensive way to attain the desired environmental results. This again reveals a mindset that is focused on selling a specific product rather than achieving the stated social goal of protecting the environment in a cost-effective way. Succinctly stated, the solar advocates are asking for a preference for the technology they seek to promote without regard to the impact that preference would have on attaining the desired social benefit.

Why are value of solar studies unhelpful?

Value of solar studies, in addition to steering policymakers away from a perspective that would help them evaluate different options for reaching policy goals, fail by their own standards, because they are inherently so complex and require so many judgment calls about parameters and inputs that even the best-intentioned studies are inevitably subjective and controversial. If reasonably complete, value of solar studies are extraordinarily complex and, to be done correctly, these studies require a great deal of time and expense. Moreover, the results, no matter how honestly derived, are always going to be highly subjective, full of debatable and contentious assumptions, and subject to severe criticism by any number of interest groups. Policymakers

treat such studies with the skepticism they generally deserve. Louisiana's value of solar study never made it out of draft.[2] In Maine, the value of solar study that (using extremely dubious methodology, including assuming solar in Maine offset carbon emissions from coal plants in New York that are not even part of the same dispatch area) found a very high "value" of solar was followed by regulatory action to gradually but significantly reduce the very same net energy metering subsidy.[3]

No state Commission has used a "value of solar" study as a basis for setting rates. The only state that even authorized using "value of solar" on a conceptual basis was Minnesota, and even there, "value" pricing has never been implemented and deployed. There is good reason why

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[2] In Louisiana, David Dismuke's study, which attributed a negative value to solar, after considering the cost of inputs such as publicly funded subsidies, was so controversial it never made it out of draft—despite the fact that Dismukes must have put enormous effort to get the details right in the face of data limitations posed by Louisiana's old fashioned meters-- for example, by combining GPS coordinates with weather data to extrapolate likely levels of rooftop solar energy production at different hours of the day. *See* Dismukes, Davide E. *Estimating the Impact of Net Metering on LPSC Jurisdictional Ratepayers.*

[3] For more information on the recent Maine PUC action, see http://www.pressherald.com/2017/01/31/puc-strikes-middle-ground-in-solar-incentives/ The Maine study I refer to is by Grace, Robert C., Philip M. Gruenhagen, Benjamin Norris, Richard Perez, Karl R. Rabago, and Po-Yu Yuen. *Maine Distributed Solar Valuation Study.* Prepared for the Maine Public Utilities Commission. Revised April 14, 2015. *Available online at::* http://www.maine.gov/mpuc/electricity/elect_generation/documents/MainePUCVOS-ExecutiveSummary.pdf. The study came up with a very high "value" of 33.7 cents/kWh, roughly double the retail electricity tariff in the state, for distributed solar which included, among other dubious findings, 9.6 cents/kWh of value for avoided emissions. Much of this estimated value came from avoided SO2 and NOx emissions from supposed avoided coal plant emissions—however, the appendix acknowledges the different (and in my view much more plausible) assumptions about marginal emissions reductions would have reduced these numbers by factors of five and ten, respectively (see pp. 83-84 of the Maine study). Value studies are riddled with these kinds of small, technical analytical choices that make a big difference in the findings and make it very hard for non-experts to evaluate how robust the resulting numbers are.

regulators have long preferred either cost-based or market-based rates to "value" analysis. Either of these approaches to pricing yields results that are much more robust, reliable, and fair to customers. For Kansas to embark on a "value" study will only cause delay, expense, and additional controversy, without resulting in any helpful clarity. Fortunately, such a study is not needed to establish a fair rate for DG customers. Basic principles of rate design are all that is necessary—and these are well documented in works like those identified by Staff in its initial comments.

A three-part rate is in the long-term interest of the development of distributed generation in Kansas.

When thinking about rate design for partial requirements DG customers, the common proposition that support for net metering and/or inflated value analysis is "pro" DG and advocacy of a three-part rate is "anti" DG is simply wrong. Despite my skepticism about wide-ranging "value of solar" claims, particularly for private DG as it is currently implemented, DG, both wind and solar has some very real benefits and long-term potential. The marginal costs of producing this energy are zero. If one looks at environmental externalities, the carbon emissions from the actual process of producing this energy itself, without taking the full cycle and secondary effects into consideration, are also zero. Significantly, the costs of solar panels themselves have declined in recent years, adding to the potential long term attractiveness of solar. Those are very real benefits that it would be valuable to capture.

In its current, most common, configuration, however, wind and solar production has some drawbacks that inhibit it from delivering the full value it might potentially offer. Wind and solar PV production is intermittent and thus requires backup from other generators and cannot

be relied on to be available when called upon to produce energy. Simply stated, wind and solar DG is not dispatchable. Its energy value is entirely dependent on when it is produced, which in Kansas, as well as most, if not all of the U.S., is for the most part not coincident with peak demand, which occurs as the sun is setting and solar generation is declining. Moreover, because of intermittency and unavailability at peak, the capacity value of solar DG is, at best, marginal. Wind, too, despite differences in production profile, faces similar challenges in reliably serving peak demand—a fact recognized explicitly in the SPP, where capacity ratings for new solar DG and wind generation facilities are designated at 10% and 5%, respectively, of nameplate capacity.

To fully develop the resource, therefore, it is imperative to provide pricing that will give appropriate price signals and incentives that will enable DG to fulfill its potential, by linking itself to storage, more efficient forms of catching the sun's energy (e.g. western rather than southern exposure, to better align solar production with peak demand), or other types of generation (e.g., wind) that complement its availability. Thus, it is critical that prices be set and rates designed in such a fashion as to provide incentives for productivity and reliability and not to subsidize private DG at a decidedly low degree of optimization. Demand charges are a very powerful incentive to economically optimize DG. In contrast, net metering deprives private rooftop solar of any meaningful price signal to better shape the demand curve of solar hosts, or shift production more into the period of peak demand on the system. DG needs to receive appropriate price signals to fully realize its capabilities.

One glaring example of this has to do with the deployment of batteries or other forms of storage, which would enable private DG customers to avoid both demand spikes

and to shift excess energy usage in ways that better reflect peak demand on the system as a whole. Another example is the way in which solar panels are installed, in terms of the direction they face. As a recent *New York Times* article explains, flat retail net metering (RNM) pricing has contributed to a nationwide misalignment of solar panels—they are generally installed facing south, to generate the largest total quantity of solar energy over the course of the day (and the greatest savings and/or revenue for homeowners under RNM). If solar rates instead reflected the cost to the grid of the customer's period of highest demand, solar panels would be aligned to capture the most sun during the customer's peak hours—for many customers, this would mean aligning panels to face west, generating less total energy, but capturing the late afternoon power of the setting sun.[4]

A final way in which a cost-reflecting three-part rate would benefit the development of rooftop solar as an economically beneficial industry in Kansas has to do with providing healthy incentives to the rooftop solar industry itself. Currently, as illustrated in the SolarCity 10K I cited in my initial comments (p. 34), the business model of large national solar companies is focused on subsidies—customer solar system prices are set at the maximum level possible while still leaving enough in potential customer savings to incentivize customers to adopt solar within the subsidized framework, leaving the margin for the solar companies themselves. An increase in subsidy, rather than lowering customer prices, simply increases solar industry profits on system installations.[5]

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[4] Matthew L. Wald. "How Grid Efficiency Went South" *New York Times*. October 7, 2014.
[5] It is surprising, in the context of the generous subsidies they receive in many parts of the country, that rooftop solar companies seem in some cases to have trouble being profitable.

In fact, there does seem to be something wrong with rooftop solar pricing in the US. The recent MIT study, *The Future of Solar Energy,* observes a "striking differential" between MIT's estimate of the cost of installing residential PV systems (even allowing for a profit margin) and the reported average prices for residential PV systems. Actual prices for residential systems were approximately 150% of MIT's cost estimate—a difference between cost and price the MIT researchers did not observe for utility-scale installations.[6] Indeed, as documented in the MIT study, there is evidence now that the declining costs of solar panels, which have been quite dramatic in recent years, are not being passed through to consumers, enabling most of the benefits of declining panel costs to be retained by solar vendors, to the detriment of all consumers, solar and non-solar alike.

Furthermore, a recent study by Lawrence Berkeley National Labs found that out of four countries it compared to the U.S. (Germany, Japan, France, and Australia), the U.S. had the highest prices (per watt of capacity) for installed residential PV systems.[7] The reason for these high U.S. prices is not fully understood—it is something more than market size, since the U.S. market is smaller than the solar PV market in some of the four other countries studied, but larger than others. A 2014 study aimed at better understanding variations in solar PV pricing, involving collaboration between researchers from Yale, Lawrence Berkeley National Laboratory,

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One factor may be large expenditures on marketing, as the industry attempts to grow very quickly.

[6] MIT, *The Future of Solar*, p. 86.

[7] Barbose, Galen and Naim Darghouth. *Tracking the Sun IX: The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States.* Lawrence Berkeley National Laboratory (August 2016):22-23.

the University of Wisconsin at Madison, and the University of Texas at Austin, found a revealing association:

> "…regions with a higher consumer value of solar, considering retail electricity prices, solar insolation levels, and incentives, tend to face higher prices. This phenomenon may be the result of a shift in consumer demand caused by the presence of rich incentives, enabling entry by higher-cost installers and allowing for higher-cost systems. Alternatively, the results may be a symptom of high information search costs or otherwise imperfect competitions, whereby installers in these markets are able to "value price" their systems, effectively retaining some portion of the incentive offered…In the short-run at least, policies that stimulate demand for PV may have the exact opposite of their intended effect, by causing prices to go up rather than down."[8]

That is, net metering, by effectively shielding rooftop solar suppliers from both robust competition and from cost-based regulation, may be removing a key incentive for rooftop solar installation companies to pass on declining costs to customers.[9]

To the extent that, in the Kansas context, rooftop solar is indeed an "infant industry," Kansas has an opportunity to set the stage for a solar industry that will not go down this path of subsidy reliance, giving the minimum to some customers while others pay for a profit margin that largely goes to the solar companies themselves. It is true that a cost-based three-part rate does create a more demanding environment for solar companies in the short run, but it is an environment that encourages efficiency, innovation, and the creation of value for both solar customers and traditional customers. Under such a rate, participation caps would not be

[8] Gillingham, Kenneth, Hao Deng, Ryan Wiser, Naim Darghouth, Gregory Nemet, Galen Barbose, Varun Rai, and C.G. Dong. *Deconstructing Solar Photovoltaic Pricing: The Role of Market Structure, Technology, and Policy*. (December 2014): 20-21. Available online at: http://www.seia.org/sites/default/files/LBNL_PV_Pricing_Final_Dec%202014.pdf

[9] The failure to pass on declining input costs to customers is pricing behavior often considered to be characteristic of monopoly pricing.

necessary. Rooftop solar would be free to grow to whatever size the economics supported, and incentivized to use technology such as batteries to maximize the value they can provide, with results that would benefit all utility customers, not just a privileged few who can afford private rooftop solar systems.

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the General Investigation to Examine Issues Surrounding Rate Design for Distributed Generation Customers.	)))	Docket No. 16-GIME-403-GIE

REPLY AFFIDAVIT OF ASHLEY C. BROWN

STATE OF Massachusetts)
) ss.
COUNTY OF Middlesex)

Ashley C. Brown, being first duly sworn on his oath, states:

1. My name is Ashley C. Brown. I am Executive Director of the Harvard Electricity Policy Group at the Harvard Kennedy School at Harvard University in Cambridge, Massachusetts.

2. Attached hereto and made a part hereof for all purposes is my Reply Affidavit on behalf of Westar Energy, Inc. having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that the information contained in my Reply Affidavit is true and accurate to the best of my knowledge, information and belief.

Ashley C. Brown

Subscribed and sworn before me this 1 day of May., 2017.

Notary Public

My Commission expires: _____

HECTOR SALAZAR
Notary Public
Commonwealth of Massachusetts
My Commission Expires Feb. 8. 2024