COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC CONSIDERATION OF THE IMPLEMENTATION OF THE NET METERING ACT	**) Case No. 2019-00256)**

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SUPPLEMENTAL COMMENTS OF THE KENTUCKY RESOURCES COUNCIL

The Kentucky Resources Council ("Council") appreciates this opportunity to submit these supplemental comments in response to the Commission's Order dated July 30, 2019[1] requesting comments from interested stakeholders to develop a record which the Commission can look to in its consideration of the implementation of the 2019 Net Metering Act ("Act") as it applies to individual utilities. Because data specific to each utility will be necessary to fully assess the questions before the Commission, these supplemental comments continue to focus (as did the preliminary comments of the Council) on several overarching themes the Council believes will be at issue in these proceedings and should be applied across all net metering rate cases brought before the Commission after

[1] The Commission's Order dated September 13, 2019, extended the deadline to submit comments to October 15, 2019. Pursuant to 807 KAR 5:001, Section 8(12)(a), this electronic filing will be followed by filing hard copies of these comments within two (2) business days.

January 1, 2020. Due to variance among individual utility characteristics and rate designs, any rate changes will of necessity be utility-specific; however, the methodology must be sufficiently robust in calculating costs and valuing benefits associated with grid-connected customer-generators of renewable electricity.

As a preliminary matter, the Council applauds the Commission for seeking comments from all interested stakeholders on the implementation of the 2019 Act in advance of the filing of a specific case pursuant to the Act, when (as noted by Commissioner Matthews at hearing), there is a time constraint on the ability to thoroughly explore the numerous complex issues surrounding the proper determination of costs and benefits attributable to the small class of net-metering customer-generators.

The Council reiterates a point made in the preliminary comments that this opportunity to provide comment should not and cannot be considered as a surrogate or substitute for allowing those individuals, organizations, or businesses that seek intervention and satisfy the standards in the Commission regulations for intervention, from being made parties to individual rate cases brought pursuant to the Act. As noted by the Commission in a February 18, 2019 Letter to Senator Brandon Smith, Chair of the Senate Natural Resources and Energy Committee, regarding a proposed (and ultimately rejected) floor amendment to Senate Bill

100, the *rate cases* are the processes by which jurisdictional utilities could propose, and the Commission could evaluate, a change in the valuation of the electricity fed into the grid by an customer-generator:

> The original provisions of Senate Bill 100 create a transparent process that would have allowed broad participation among all stakeholder interests with the ability of the Commission to fulfill its statutory directive to establish rates that are fair, just and reasonable to all ratepayers.

February 18, 2019 Letter to Senator Brandon Smith, annexed as Attachment 1.

The Council concurs with the Commission that *broad participation among all stakeholder interests* should be part of any such rate case and anticipates that the Commission will grant liberally intervention to stakeholders reflecting a range of interests in order to assure such broad participation, just as it did when the initial model net metering tariff and interconnection guidelines were developed following adoption of net metering by the Kentucky General Assembly.

The Council also concurs with the comments of the Kentucky Office of Energy Policy that in determining the value of the credit that is to be accorded electricity fed into the grid over a billing period from a distributed generator, the Commission should create a "robust stakeholder process" to assure that the resulting changes, if any, in rates charged by a jurisdictional utility to participating customers, are fair, just, and reasonable.

The Council hopes that this comment period has assisted the Commission in framing the issues and understanding the concerns of other stakeholders in advance of the filing of a specific rate case, and the Council holds out hope that the utilities will begin to work collaboratively toward developing reasonable, fact-based policies that are fair to all stakeholders, and to develop rates for crediting of distributed generation under the Act that are fair, just, and reasonable to participating and non-participating customers. Collaboration, and not "clobberation," will generate a far better and more acceptable end-product than the raw politics of power that has marked the development and passage of SB 100 and has brought us to this point.

As discussed in the Preliminary Comments submitted by the Council, there are a few key points that should guide the Commission's review of any proposed tariff pursuant to the 2019 Act.

First, the Commission must assess the full range of costs *and* benefits specific to each utility in establishing the rate at which energy fed into the grid by net metering customers will be credited. As noted by the Commission in the February 18, 2019 to Senator Brandon Smith:

> Utilities and the territories they serve have quite distinct differences, and it is because of these variations that the ratemaking process should reflect a utility's unique characteristics and the specific cost of serving that utility's

> customers. The same holds true for examining the quantifiable benefits and costs of net-metered systems.

February 18, 2019 Letter to Senator Brandon Smith, Attachment 1.

Second, KRS 278.466 allows utilities to use the ratemaking process to recover costs necessary to serve its net metering customers, "without regard for the rate structure for customers who are not customer generators." The utility proposing an alternative rate structure for customers taking service under the replacement tariff bears the burden of demonstrating through sufficiently robust data and appropriate analysis, that any changes to the rate design, including the current fixed charge currently applicable to both participating and non-participating ratepayers of that class, are fair, just, and reasonable, and properly allocate costs of service and credit for benefits (including avoided costs). Despite spending copious amounts of money to convince legislators and ratepayers to the contrary, no empirical evidence has been produced to date by any jurisdictional utility in Kentucky that net metering customers cost more to serve than other residential customers, or that any material cross-subsidization is occurring intra-class or inter-class between participating and non-participating ratepayers. The Council's own analysis, which did not account for any benefits provided by net metering customers to other customers, the grid, or the utility, showed no

evidence of cross-subsidization occurring between customer classes at any more than a miniscule level. This finding is consistent with the 2017 Lawrence Berkeley National Laboratory Report *Putting The Potential Rate Impacts of Distributed Solar Into Context,* which concluded that "for the vast majority of states and utilities, the effects of distributed solar on retail electricity prices will likely remain negligible for the foreseeable future." The 2017 LBNL Report, authored by Galen Barbose, was appended to KRC's Preliminary Comments as Attachment 2.

Additionally, while utilities deserve an opportunity to seek to recover their costs and a fair rate of return on prudent investments for providing reliable service through fair, just, and reasonable rates, abrupt changes to the current net-metering relationship would violate the rate-setting principle of gradualism and could dramatically slow the rate at which distributed generation from renewable sources is incorporated into the grid.[2] A significant reduction of the dollar value of the credit provided for fed-in electricity from distributed generators under the net-metering tariff, could encourage those customers to exit the grid entirely, to the detriment of the system, the financial health of the

[2] Naim R. Darghouth, *Net Metering and Market Feedback Loops: Exploring the Impact of Retail Rate Design on Distributed PV Deployment*, Lawrence Berkeley National Laboratory Energy Technologies Area July 2015, annexed as Attachment 3 to the Preliminary Comments of the Kentucky Resources Council.

utilities, and other customers remaining grid-connected. Changes to net metering valuation necessarily have policy implications that affect economic development, utility customers, both participating and not, and the environment; all of which deserve consideration. The Bonbright principles regarding rate design and rate setting are as applicable here as in any rate case and counsel against radical changes in rate design or fed-in solar valuation.

Finally, as the Commission noted in the February 18, 2019 letter, it has "broad authority to consider all relevant factors presented during a rate proceeding, *which would include evidence of the quantifiable benefits and costs of a net-metered system."* (Emphasis added). The consideration of "quantifiable" benefits of distributed solar should include all those benefits recognized and asserted by the jurisdictional utilities when they have proposed and requested Commission approval for utility-installed solar capacity despite the existence of sufficient coal-fired capacity within those utility systems.

In KRC's Preliminary Comments, three significant points were raised. First, net metering reform is a complex topic and a wide variety of stakeholders with unique interests should be given the right to intervene in individual rate cases to ensure full consideration of the issues.

Second, in determining the dollar value of the credit to be provided to net metering customers for their excess energy generation, the Commission's analysis should be thorough and transparent and assess the full range of costs and benefits provided by distributed technologies.

Finally, available empirical data does not support the utilities' argument that net metering customers are causing cost shifting within any ratepayer class or that net metering customers are not paying their "fair share" of the fixed costs of service to ratepayers within that class, relative to non-participating ratepayers within that class.

Supplemental Comments

The 2019 Net Metering Act redefines the relationship of customer-generators and their jurisdictional utility going forward, so that instead of netting the difference between the amount of energy fed back to the grid and the amount of energy consumed on a kilowatt basis, net metering will be the difference in dollar value between the electricity fed back to the grid and the electricity consumed by the customer generator. The Net Metering Act directs the Commission to set the rate of compensatory credit in proceedings initiated by one or more utilities, which will necessarily involve determine the value to the utility, other customers, and the grid, of the energy the customer-generator feeds back

to the grid. Numerous studies and state utility commissions have considered this question and there is no overarching consensus as to how to value these resources. However, almost all methodologies agree that both the costs and benefits of the distributed resource should be assessed and that the process should be based upon reliable data.

So too, this Commission has indicated that in a rate proceeding brought under the 2019 Act, it will receive and consider evidence "of the quantifiable benefits and costs of a net-metered system" as being relevant factors in the rate proceeding. Attachment 1, p 2.

I. The adjustment of value of the credit to be provided to fed-in electricity from customer-generators applies *only* to valuing the excess electricity fed-in over that consumed by a customer-generator over the course of a billing period – instantaneous netting is not contemplated by the revised law.

A threshold question of law that the Commission must address is *what* is to be valued – whether it is any electricity fed into a grid during an hour, a calendar day, or instantaneously, or whether it the *excess* of electricity fed back into the grid above that consumed by the customer-generator from the utility over a billing period (which for jurisdictional utilities is typically roughly a monthly frequency.)

The revised definition of "net metering" under KRS 278.465(4) reflects that it is the *excess* of generation that is netted over a billing period, rather the any electricity fed into the grid at any time (i.e. instantaneous netting) that is intended by the statute to be subject to revaluation. A comparison of the use of the phrase "over a billing period" in the current definition of net metering (that is in effect until January 1, 2020), with the use of the same phrase by the General Assembly in the revised definition, reflects no intention by the General Assembly to alter the current practice under existing law that nets out the electricity used and generated within a billing period and provides a credit or debit only for the excess produced or consumed over the monthly billing period.

To read the statute otherwise would be inconsistent with that statutory language and would also require that regulated utilities have metering equipment beyond the standard bi-directional meter that would allow for the capture and analysis of fed-in electricity on an instantaneous basis. The General Assembly did not contemplate the replacement of such meters with the infrastructure needed to support instantaneous netting, since even after January 1, 2020, KRS 278.466(2) still requires (as has existing law) only that a standard meter be provided to customer-generators:

> Each retail electric supplier serving a customer with electric generating facilities shall use a standard kilowatt-hour meter capable of registering the flow of electricity in two (2) directions. Any additional meter, meters, or distribution upgrades needed to monitor the flow in each direction shall be installed at the customer-generator's expense. If additional meters are installed, the net metering calculation shall yield the same result as when a single meter is used.

KRS 278.466(2) (Effective January 1, 2020).

In sum, the netting of electricity consumed and that fed-in should remain as currently done, and the change, if any, in valuation of the fed-in electricity from a customer-generator should apply *only* to the excess of electricity generated over that consumed in any monthly billing period.[3]

II. The Commission has both the authority and the obligation to consider all costs and benefits associated with the generation of renewable electricity by customer-generators.

Utilities have uniformly argued in this case that net metering customers should be compensated at the "avoided" cost rate under PURPA, which is the cost the utility would have to pay to purchase or generate energy itself. However, the avoided cost rate approach fails to recognize that net metering customer-generators are not utilities and that the characteristics of such generation are fundamentally different than that of a traditional independent power producer

[3] Whether the Commission determines to re-value all fed-in electricity rather than the excess over a billing period, an approach that the Council believes would be inconsistent with SB 100, **all** costs and benefits must be evaluated in determining the value of the dollar-denominated credit to be credited, in order to fairly, justly, and reasonably value that electricity.

under PURPA. Customer-generators receive no compensation for electricity fed into the grid; only a credit that can never be cashed-out. Customer-generators pay a fixed meter charge, equivalent to that paid by non-participating ratepayers of the same class.

Further, unlike power purchased from a traditional producer or produced by the utility, the utility incurs no transmission and little-to-no distribution costs since customer-generated energy is either consumed on site or consumed by the customer's neighbor, the next closest energy user in the system. In addition, line losses, which average about five (5) percent of electricity transmitted and distributed annually in the United States, are avoided with customer-generated energy, resulting in further savings.[4] Thus, any proposal to credit net metering customers at the avoided cost rate, fails to take into consideration the unique characteristics of distributed generation and the benefits utilities receive from these energy sources in comparison to other wholesale power purchases.[5] The

[4] U.S. Energy Information Administration, available at: https://www.eia.gov/tools/faqs/faq.php?id=105&t=3 (based upon data averaged from 2013-2017).

[5] The General Assembly considered, and rejected, setting the value of fed-in electricity from net-metering systems, at the avoided cost. Using the avoided cost/PURPA approach would conflict with the legislative intent of SB 100, in which the General Assembly specifically rejected such an approach to valuation of fed-in electricity.

Commission has itself noted that a categorical setting of the rate to be credited for fed-in electricity would be arbitrary, since that "[b]enefits of generation from net-metered systems vary for a number of reasons, including locational benefits, specific utility load factors, etc." While a rate *formula* may be established by the Commission in a rate case under the 2019 Act, the specific costs and benefits will vary in value depending on the "unique characteristics" of the utility, including the rate design and territory served.

While it is clear that net metering provides benefits to utilities, as well as to other customers and the grid, there is no clear consensus on a valuation methodology for quantifying the rate that should be paid to consumers. While the weight given to various factors may necessarily be specific to the location or utility,[6] there is an overwhelming consensus that distributed energy generation fed back to the grid can and does provide a host of benefits, including those described above but also others that differentiate customer-sited generation from wholesale power purchases. This full range of benefits, in addition to costs,

[6] For example, many studies add value for aiding in meeting a solar carve out requirement for renewable energy portfolio standards, however, this would not be applicable in a state like Kentucky that does not have a renewable energy portfolio standard. Thus, while other studies are instructive, variables used in computing the value of solar in Kentucky must be specific to the unique situation existing in the Commonwealth.

should be taken into account in coming to a fair valuation to credit net metering customers for the excess energy they produce.

In recent years, numerous cost-benefit, location-specific studies have been done relating to net metering and distributed solar[7] and several additional studies have reviewed solar valuation studies in order to understand trends and explore ways to standardize valuation methodologies. These studies show at the very minimum that an assessment of a range of benefits in addition to costs is standard. Most, if not all studies take into account avoided energy costs and avoided capital and capacity investment, and a majority of the studies consider reduced financial risks due to predictable pricing of net metered solar, reduced costs of environmental compliance, and avoided greenhouse gas emissions.[8]

[7] While the Kentucky Net Metering Act applies to other forms of renewable energy besides solar, we focus on solar here since it is by far the most common form of net metered energy in Kentucky and nationwide and most valuation studies focus on solar. The principles and analysis here can apply equally to other renewable energy options, as well.

[8] ICF, "Review of Recent Cost-Benefit Studies Relating to Net Metering and Distributed Solar (May 2018) (prepared for the U.S. Dept. of Energy) available for download at: https://www.icf.com/blog/energy/value-solar-studies; Environment American, "Shining Rewards: The Value of Rooftop Solar Power for Consumers and Society" (2016), available at: https://environmentamerica.org/sites/environment/files/reports/AME%20ShiningRewards%20Rpt%20Oct16%201.1.pdf.

Other categories assessed by at least some studies include grid resiliency, other environmental benefits, and societal benefits.

As a recent analysis by ICF for the U.S. Department of Energy notes, the value of solar in any given study necessarily depends on the data considered and the assumptions made.[9] The study explains the important differences that caused the studies analyzed to arrive at varying conclusions:

> Some differences are caused by variables that are geographically and situationally dependent, while other differences are driven by the input assumptions used to estimate their value. Studies use a range of assumptions for factors that influence results, such as marginal unit displacement, solar penetration, integration costs, externalities, and discount rates. Furthermore, the stakeholder perspective – whether costs and benefits are examined from the view of customers, the utility, the grid, or society at large – is a key influencer of the methodology employed by the studies and their resulting direction and outcomes.
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> Overall observations from this analysis show, not surprisingly, that a major challenge in studying and developing an approach to [net energy metering], the value of solar, and [distributed energy resource] valuation is that some value components are relatively easy to quantify, while others are more difficult to represent by a single metric or measure.[10]

[9] ICF, "Review of Recent Cost-Benefit Studies Relating to Net Metering and Distributed Solar (May 2018) (prepared for the U.S. Dept. of Energy") available for download at: https://www.icf.com/blog/energy/value-solar-studies

[10] *Id.* at iii.

Recognizing a need for a standardized approach, both the Interstate Renewable Energy Council and the National Renewable Energy Laboratory have developed guides for regulators to use in assessing the costs and benefits of distributed renewable energy.[11] The Interstate Renewable Energy Council study came to three major conclusions on valuing distributed solar generation ("DSG"):

- DSG primarily offsets combined-cycle natural gas facilities, which should be reflected in avoided energy costs.

- DSG installations are predictable and should be included in utility forecasts of capacity needs, so DSG should be credited with a capacity value upon interconnection.

- The societal benefits of DSG policies, such as job growth, health benefits and environmental benefits, should be included in valuations, as these were typically among the reasons for the policy enactment in the first place.[12]

[11] Interstate Renewable Energy Council, "A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation," (October 2013) available for download at: https://irecusa.org/2014/02/solar-will-you-marry-me-for-a-contract-period-of-20-years/; National Renewable Energy Laboratory, "Methods for Analyzing the Benefits and Costs of Distributed Photovoltaic Generation to the U.S. Electric System (September 2014), available at: https://www.nrel.gov/docs/fy14osti/62447.pdf.

[12] Interstate Renewable Energy Council, "A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation," 3 (October 2013) available for download at: https://irecusa.org/2014/02/solar-will-you-marry-me-for-a-contract-period-of-20-years/

The National Renewable Energy Laboratory model focused on recommended methodologies for calculating costs and benefits from the utility perspective. Despite the decision to focus on the utility perspective and not the customer and societal perspectives,[13] the NREL model recommends, and provides methods for calculating the following broad categories of costs and benefits: 1) energy displaced by customer-generated energy; 2) environmental benefits and costs, including avoided emissions, avoided water use, and avoided land impacts; 3) transmission and distribution losses; 4) generation capacity value associated with deference of capital investments; 5) transmission capacity value for reducing the need for additional transmission capacity; 6) distribution capacity value for reducing the need from distribution capacity; 7) benefits and costs of ancillary services (operating reserves and voltage control);[14] 8) other benefits and costs

[13] However, the report recognizes that there are additional costs and benefits from the perspective of other stakeholders that were not included in the report. "While various benefits and costs can accrue to different entities—such as utilities, consumers, and society as a whole—the focus here is primarily on quantifying the benefits and costs from the utility or electricity-generation system perspective and providing the most useful information to utility and regulatory decision makers." National Renewable Energy Laboratory, "Methods for Analyzing the Benefits and Costs of Distributed Photovoltaic Generation to the U.S. Electric System, 1 (September 2014), available at: https://www.nrel.gov/docs/fy14osti/62447.pdf.

[14] The penetration rate of net-metered distribution generation in Kentucky almost certainly too small to have a quantifiable impact in this category.

such as fuel price hedging/diversity and market-price suppression.[15] While these models add to a dizzying array of costs and benefits that can be assessed and varying methodologies for calculating those, it is regardless important for the Commission to consider the full range of benefits provided by net-metered energy sent back to the grid, in addition to the costs, and to consider the costs and benefits not just to utilities, but to a variety of stakeholders and society as a whole.

Despite the variability of methodologies used and factors considered and the locational differences between states, is noteworthy that a significant number of studies have found that the value of customer-generated distribution generation is *higher* than the retail rate. Environment America Research and Policy Center conducted a review of sixteen (16) analyses on the value of rooftop solar in 2016.[16] The studies reviewed were published between November 2012 and August of 2016 and include analyses undertaken in a variety of states for or by public utility commissions, environmental groups, utility companies, and

[15] National Renewable Energy Laboratory, "Methods for Analyzing the Benefits and Costs of Distributed Photovoltaic Generation to the U.S. Electric System (September 2014), available at: https://www.nrel.gov/docs/fy14osti/62447.pdf.
[16] Environment American, "Shining Rewards: The Value of Rooftop Solar Power for Consumers and Society" (2016), available at: https://environmentamerica.org/sites/environment/files/reports/AME%20ShiningRewards%20Rpt%20Oct16%201.1.pdf.

consulting firms. On average, the studies found that the median value of rooftop solar was 16.35 cents per kWh while the average residential electric rate was 13.05 cents per kWh. Thirteen of the sixteen studies found that the value of rooftop solar was higher than Kentucky's average retail rate of electricity, which is 8.57 cents per kWh as of 2017.[17] Of the three studies that did not, two were written by or commissioned by the utility industry.

In 2016, the Brookings Institute also analyzed "the accumulating national literature on costs and benefits of net metering," and found that these studies, whether conducted by PUCs, national laboratories, or academia, increasingly conclude "that the economic benefits of net metering actually outweigh the costs and impose no significant cost increase for non-solar customers."[18] An assessment of solar valuation studies by the Rocky Mountain Institute reached similar conclusions and found that the average value of solar of the studies assessed was

[17] U.S. Energy Information Administration, "State Electricity Profiles," available at: https://www.eia.gov/electricity/state/kentucky/

[18] Mark Muro and Devashree Saha, "*Rooftop solar: Net Metering is a Net Benefit,"* (May 23, 2016), available at: https://www.brookings.edu/research/rooftop-solar-net-metering-is-a-net-benefit/

17 cents per kWh, compared to an average residential retail rate of 12.5 cents per kWh.[19]

Similar conclusions have been reached in other southeastern states comparable with Kentucky in terms of solar penetration. A 2014 study commissioned by the Mississippi Public Utilities Commission found that after comparing the per-MWh costs of distributed solar generation to its benefits, expressed as avoided costs, distributed solar would provide levelized net benefits to Mississippi over a period of 25 years.[20] The study concluded that:

> [S]olar net metered projects have the potential to provide a net benefit to Mississippi in nearly every scenario and sensitivity analyzed. This may never happen if net metering participants are not expected to receive a reasonable rate of return on investment.[21]

In addition, while the Mississippi study found a net benefit from net metering, it is noteworthy that this analysis did not include potential environmental and public

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[19] Rocky Mountain Institute, Energy Innovation Lab, *"A Review of Solar PV Benefit and Cost Studies*" (Sept. 2013), available for download at: https://rmi.org/insight/a-review-of-solar-pv-benefit-and-cost-studies/

[20] Elizabeth Stanton, et al., Synapse Energy Economics, Inc., "Net Metering in Mississippi" (Sept. 19, 2014), available at: https://www.synapse-energy.com/sites/default/files/Net%20Metering%20in%20Mississippi.pdf

[21] *Id.* at 49. The study found that residents would need to receive slightly above the retail rate for energy sent back to the grid to make solar economical, however, these conclusions may be different now given that the costs to install rooftop photovoltaic systems have dropped since 2014 when this study was completed.

health benefits and instead focused on the money that utilities would save for every MWh of distributed solar adopted. When environmental and societal benefits have been considered along with avoided costs, the benefits of distributed generation have been even higher. For example, a 2015 study commissioned by the Maine Public Utility Commission assessed a value of solar of 33 cents per kilowatt hour, compared to an average retail rate of just 13 cents per kilowatt hour when reductions in air and climate pollution and other societal benefits were also taken into account.[22]

The Commission represented to the General Assembly that all quantifiable costs and benefits would be considered in setting a value for the compensatory credit. The Council expects it will do no less and will include a full range of stakeholders needed to speak competently to these values and costs from all perspectives.

III. All kilowatts are not "created equal" when it comes to human health and the environmental impacts of the generation of electricity, and in valuing fed-in renewable electricity, the Commission must follow precedent in recognizing as legitimate the incorporation of environmental benefits in the calculation of "net cost" just as it has incorporated the environmental costs of coal-fired generation into rates paid by customers and environmental surcharges imposed on ratepayers.

[22] Clean Power Research, "Maine Distribubed Solar Valuation Study" (March 1, 2015), available at: https://www.nrcm.org/wp-content/uploads/2015/03/MPUCValueofSolarReport.pdf

The question of whether environmental and public health impacts of electricity generation should be considered in setting a value for fed-in renewable electricity is one that has long-standing Commission precedent. Through both rate cases and through the environmental surcharge mechanism, the Commission has repeatedly reviewed and determined to be reasonable the installation of pollution control equipment and measures by jurisdictional utilities intended to reduce air pollution, water pollution, and land and groundwater contamination from the generation of coal-fired electricity and management of ash from coal-fired generating plants.

These pollution control measures were by and large mandated by the U.S. Environmental Protection Agency under the Clean Air Act, Clean Water Act, and Resource Conservation and Recovery Act, upon findings by the USEPA that ambient levels of pollution of these various media imposed unacceptable costs in terms of human health, morbidity and mortality, and pollution of waterways and contamination of lands. As required by Congress, the adoption of technology-based controls and ambient pollution control standards have been accompanied by cost-benefit analyses that give specific and tangible valuation to avoided health and environmental impacts through reduction of pollution.

Compliance with those standards has significantly reduced, but has not eliminated, those adverse human and ecological impacts of fuel choices in electricity generation (including air pollution from fine particulates, oxides of nitrogen, sulfur oxides, mercury, and land and water pollution from metals in coal ash). There is still a quantifiable adverse effect on human health and the environment that remains, due to economic considerations attendant to the age of the sources of pollution and due to limits of pollution control technology. Those remaining costs are both capable of quantification and have in fact **been** quantified through the same rulemaking processes that resulted in imposition of pollution limits that resulted in equipment and facility construction that the Commission recognized as legitimate, and for which the ratepayers ultimately paid.

Just as those costs of pollution controls have been partially internalized and socialized through the ratemaking and surcharge processes, the **avoidance** of those costs through the generation of non-polluting renewable energy, is both capable of quantification, and **must** be evaluated in order that the process not be skewed to favor non-renewable power over renewable energy. A fair valuation will include the full range of avoided human health and ecological costs

associated with the coal-fired generation that would otherwise be undertaken to meet that demand.

As to the specific question of whether the mitigation of climate change and reduction of greenhouse gas emissions should be considered a quantifiable benefit, the Council believes that it must. There are several sources to which the Commission could look to assign a dollar value to mitigation of GHG emissions. A number of utility IRPs have, as part of demonstrating that a particular mix of generation and other measures represent the least cost alternative, assigned a range of values to GHG emissions, assuming as reasonable the observation that GHG emission control under the Clean Air Act will occur and that such costs must be considered in charting a course to meeting customer demand in the future. Additionally, in filings before this Commission, jurisdictional utilities have recognized the value of solar as a hedge against GHG emissions, and have requested approval by the Commission of solar additions to their generating assets for that reason.

While some utilities in Kentucky have argued that the benefits of solar are "intangible" and "lack market value" when advocates of distributed renewable generation have raised the issue of GHG emission mitigation, utilities have themselves identified those very benefits as reasons for approving new utility-

owned solar arrays. It seems that the intangible and amorphous nature of the value if solar takes on a crystallized, tangible and defined form when it is attached to a rate of return for the utility, but not when it is generated by a customer-generator who has borne the risks of the installation and non-performance of the system.

In defending the proposal to construct a 10-mW solar array in the Public Service Commission Case 2014-00002 as the least-cost option to "meet customer needs while at the same time complying with recently enacted and anticipated air quality regulations in the most cost-effective manner," the Chief Operating Officer of Louisville Gas and Electric Company made these observations *under oath*:

> "[C]onstructing the Brown Solar Facility will allow the Companies to add a renewable resource with relatively minor impact to customer revenue requirements in the coming years."
>
> "[T]he Brown Solar Facility will broaden and further diversify the Companies' fuel supply sources and reduce future greenhouse gas emissions."
>
> "The Companies believe it is prudent at this time to construct a facility to expand their renewable energy sources. A number of developments have enabled the Companies, for the first time, to present a feasible proposal to the Commission for a solar generation facility. The declining price of solar panels, available federal tax credits, and renewable energy certificates have helped create this opportunity.... These developments, along with the increased likelihood of carbon constraints, have created a reasonable opportunity for the Companies to add a renewable source to their

generation portfolio and gain the valuable experience that will result from constructing and operating that source."

Thus, according to the sworn testimony of the COO for LG&E/KU, adding renewable energy to the utility portfolio has measurable value, the likelihood of carbon constraints and decline in future greenhouse gas emissions have tangible value, and diversification of fuel supply sources likewise has measurable value.

Other testimony in that case indicated that expanding solar generation produced benefits:

> "The Companies believe it is prudent at this time to construct a facility to expand their renewable energy sources."
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> "Given the increasing likelihood of carbon constraints, the ability to sell renewable energy credits, and the availability of federal tax credits if a solar facility is operational by the end of 2016, the Companies believe a solar facility will be a prudent fuel-diverse addition to the generation portfolio and will reduce future greenhouse gas emissions."

In describing the factors that led to the decision to construct the combined-cycle gas and the solar arrays, the LG&E/KU witness in charge of energy supply and analysis gave these factors as being key to the decision:

> [The] decision was reached after an extensive process that considered: (1) the Companies' load forecast and the uncertainty associated with it; (2) the impact of the Companies' demand-side management ("DSM") programs on future generation resource needs; (3) the potential for future regulation of greenhouse gas ("GHG") emissions by the U.S. Environmental Protection

Agency ("EPA"); (4) the issuance and evaluation of a Request for Proposals ("RFP") for capacity and energy to replace the retired generation facilities and meet future load growth; and (5) the uncertainty associated with future natural gas prices.

Distributed solar provides many of these same benefits to the utility and other customers that the utility-owned array would, according to the utility witnesses, provide with respect to price volatility, adapting to greenhouse gas regulation, and more.

With respect to whether GHG emission mitigation has quantifiable value, the prefiled written testimony in that case of Mr. Sinclair argued that it does:

> Q. You have previously testified that regulation of CO2 was essentially "unknown and unknowable." Has your position changed?
>
> A. Somewhat. As I said, the future remains highly uncertain regarding CO2 regulation in the U.S. Many people believe that the Clean Air Act is not really suited for regulating CO2 emissions and that new legislation is needed from Congress. Given the current climate in Washington, it is hard to envision bipartisan support for GHG legislation. Second, court challenges continue related to past actions taken by EPA to regulate CO2 emissions and threats of future litigation are being made should EPA press ahead on regulations for existing power stations. In this environment, much remains unknown about if, when, and how CO2 might be regulated in the future. However, the Companies feel that enough is known that the risk of future CO2 regulations should be part of a 30-year analysis related to the next generation resource and that a resource should be economically robust with or without future CO2 regulations. I would add, however, that there is not enough known about the potential for CO2 regulations to evaluate

material changes to the Companies' existing generation fleet." (Italics added).

Mr. Sinclair also noted that:

"I would point out that the Companies are recommending the construction of a NGCC unit and a solar facility, both of which become more economically attractive the greater the weight one places on future CO2 emission costs."

"While the Brown Solar Facility is not a lowest reasonable cost resource absent REC prices greater than $57/REC, as can be seen in Tables 35, 36, and 37 in the Resource Assessment, the Companies are proposing to move forward with the project because *(i) it is a prudent hedge against both GHG regulations and natural gas price risk; (ii) it will reduce the Companies' GHG emissions; (iii) it affords the Companies the opportunity gain operational experience with an intermittent renewable resource; and (iv) it does not materially add to revenue requirements over the next 30 years."* (Emphasis added).

Thus, what tipped the scales in favor of solar even where renewable energy credits are below the cutpoint that they would make the solar array the least-cost resource was, according to the utility witness, the value of solar as a prudent hedge against greenhouse gas regulations and natural gas price risk, and the reduction it would provide in GHG emissions by the companies. These same benefits accrue to the utility and other utility customers from an increase in

distributed solar generation, yet the utilities claim that those values are intangible and unquantifiable in the latter context.

In the 2013 LG&E and KU Resource Assessment in Case No. 2104-00002, it is noted that:

> "As long as Kentucky does not have a renewable portfolio standard, the Companies would have the option to sell the Renewable Energy Certificates (RECs) that are created when the facility produces electricity. Today, the market price in Ohio for solar RECs from Kentucky is $24-28 per REC."
>
> "Given the increasing likelihood of CO2 constraints and the ability to sell Renewable Energy Certificates ("RECs"), the Companies also recommend building a 10 MW solar facility at the existing E.W. Brown station. The solar facility is a prudent hedge against both GHG regulations and natural gas price risk, it will reduce GHG emissions, it affords the Companies the opportunity to gain operational experience with a solar PV resource, and it does not materially add to revenue requirements over the next 30 years."

The testimony of John Voyles on behalf of LG&E/KU further underscores that there are tangible, measurable benefits to expanded solar generation within a utility system in the Commonwealth:

> Given the increased likelihood of carbon constraints, the Companies believe the Brown Solar Facility will be a valuable addition to their generation portfolio[.]

Finally, the testimony of the Director of Environmental Affairs in support of the E.W. Brown solar array noted the value of solar with respect to environmental

permitting and regulatory compliance costs, noting that "[t]here will be no requirements for an air permit or water withdraw/discharge permit."

It is curious indeed that, as noted earlier, when expanding solar generation is proposed by the utility, social values and environmental benefits described as "intangible" and "unquantifiable" take on a quantifiable, measurable, and tangible form. In weighing the costs and benefits of distributed solar generation to a utility system and to other customers, it is clear from the testimony of the witnesses in the Brown solar array case that the value of solar as a prudent hedge against greenhouse gas regulations and natural gas price risk, and in the reduction it would provide in GHG emissions for the companies, is both quantifiable and substantial.

In sum, a full range of costs and benefits should be assessed by the Commission in determining the rate of compensation for excess energy produced by net metering customers. In assessing benefits from the utility perspective, the vast majority of studies cited above support the inclusion of benefits beyond the almost universally agreed benefits of avoided energy costs and capital investments. Additional benefits appropriate for consideration are described above and should be considered in any comprehensive analysis. In addition, the benefits and costs assessed should include benefits beyond those from the utility

perspective, such as job growth (or lack of job losses), public health, and other environmental benefits. Finally, in analyzing the costs and benefits the Commission chooses to take into account, the methodologies employed to calculate those benefits should be evidence-based and assumptions, reasonable.

IV. The premise that non-participating ratepayers are subsidizing customer-generators is not supported by empirical evidence, and ignores the reality that under a rate design that blends costs of serving individual customers, lack of uniformity of rate design impacts on any individual ratepayer is inherent in that design and is not a function of a customer taking service under a net metering tariff.

In addition to arguing that excess renewable energy generation from customers should be compensated at the utility's avoided cost rate, the utilities have argued that solar net metering customers do not pay their "fair share" for the costs of service. According to the utilities, non-participating customers, and in particular low- or fixed-income customers, are being required to subsidize the participating ratepayers. The utility industry makes these same arguments across the country and would have consumers and policy makers believe that these arguments are true regardless of the unique situations in each state. While some states with high levels of distributed energy penetration may have legitimate concerns that cost shifts do or could occur, the assertion that distributed energy customers in Kentucky are not paying their fair share or are being subsidized by

other ratepayers has not been supported by any empirical data provided by the utility companies in Kentucky. Absent such evidence, there is no basis in this Commonwealth at this time to create a separate rate class or to impose additional charges on customer-generators. Instead, the Council's own analysis using publicly available data shows that any impact on non-participating ratepayers in the same class is negligible.

The claim of "cross-subsidization" within the ratepayer class between customers who use less electricity and those who use more, is **not** a function unique to net-metering customers but rather is an attribute ***inherent*** to Kentucky's jurisdictional utilities' rate designs. Because the tariffed costs of serving individual ratepayers are blended rather than individually calculated for each customer, some ratepayers within a class who use more electricity will pay a higher percentage of those fixed costs that are imbedded in volumetric charges, than those who use less.

In order to justify imposition of disparate charges on customer-generators due to paying less of the fixed costs imbedded in the volumetric charges, each utility bears the burden of proof is what is each customer's cost within a particular rate class, how much (if any) of the fixed costs of serving that customer

are embedded in volumetric rates, and how much less of those costs are being paid by a customer-generator relative to all other ratepayers within that class. This question is inherently an "exercise in false precision"[23] because the variable rates through which the utilities attempt to recover a portion of the fixed cost of service do not generate unique rates for the consumption patterns or cost of service to each individual ratepayer.[24] Currently, absent time-of-use rates, residential ratepayers pay the same flat rate regardless of the time of day, the weather, or other variables that affect the costs the utility pays for serving that customer. Utility costs of supplying electricity can vary widely over short time periods and due to other factors, yet, the rates utilities charge are typically *not* time dependent and, as noted by one of the utility stakeholders comments in today's hearing, are blended and averaged across an entire rate class. Furthermore, distribution and transmission costs vary based on where a person lives. The demand costs to serve each customer vary based upon the amount of energy the customer is using during various times. Thus, "cross-subsidization" is an inherent feature of a system designed to average the unique circumstances of

[23] *Id.* at 118.

[24] National Association of Regulatory Utility Commissioners, *Distributed Energy Resources Rate Design and Compensation* 20 (2016) ("In practice, rates are not based on an individual customer's cost to serve; rather, similar customers are accumulated into rate classes. In this way, the total cost incurred to provide service to the entire rate class can be determined through detailed studies using cost-causation principles. This total cost is then allocated across all the customers in that rate class.")

tens to hundreds of thousands of customers. The actual cost of serving a particular customer is very difficult to accurately calculate because that customer's rate is based on a blended average of the cost to serve the class as a whole.

Thus, the rate all customers pay is either higher or lower than the actual cost to serve that individual customer. Comparing the cost to serve a customer-generator to the cost to serve any other customer in a class is like comparing apples and oranges because it focuses only on the alleged cross-subsidy the utilities claim the customer-generator is receiving, yet ignores the cross-subsidies inherent in the ratemaking design and structure itself, in which numerous other customers pay more or less of the costs of serving the aggregated ratepayer class due to consumption patterns. For example, while customer-generators may use less energy, some of those customers may use the system predominantly during times when energy costs more for the utility, costing the utility far more than a customer-generator that uses energy predominantly during non-peak hours. Customers that run all their appliances at once rather at different times throughout the day cost the utility more. Customers that engage in energy efficiency measures, live in smaller houses, use gas heat instead of electric in the winter, or only use their homes part of the year, for example, all pay lower

volumetric rates, and according to the utility argument, may not be paying their "fair share" of the fixed costs required to serve them. Customers that receive the same service but live in different areas may have widely varying costs of service. Thus, avoided energy usage that results in the recovery of less fixed costs solely due to the utility's own rate design is not a "cost" of serving a customer-generator. Instead, this is a cost of serving the entire rate class and is a problem independent of net metering impacts.

In a system in which cross-subsidization is inherent in the rate design and is not a function solely of a handful of customer-generators, it is only reasonable and fair to take into account and to isolate all other forms of cross-subsidization within a ratepayer class in setting costs for customer generators. The utilities cannot argue that customer-generators are receiving unfair subsidies without giving those same customer generators credit for other cross-subsidization that may be occurring in the rate class that is detrimental to them. Given the fact that data necessary to calculate the extent of various forms of cross-subsidization within a rate class, such as time of day usage rates, does not exist in many cases, and since no data has been provided showing any cross-subsidization is in fact occurring, the Commission must then consider whether it is fair, just, and reasonable to impose extra costs on customer-generators because they reduce

their energy usage by making their own, while not imposing additional costs on any other ratepayers that reduce their energy usage or receive a subsidy in a different form.

Furthermore, given that costs allocation methodologies do not produce precise results and are subject to extensive debate as to data, applications, and assumptions,[25] it is important for the Commission to consider that customer-generators make up far less than 1% of the ratepayers. With the numerous ways of allocating costs, the fact that cross-subsidization is occurring across the entire rate class for a variety of reasons, and the lack of any substantive data that shows customer-generators' reduction in volumetric energy use is resulting in additional costs of service compared to other ratepayers that reduce their own energy usage or use higher cost energy or capacity, it would be contrary to the principles of gradualism, reasonableness, and fairness to impose separate and higher charges on a miniscule subset of customers at this time. SB 100 requires a disaggregation of blended costs that will be inherently unreasonable, arbitrary, and unfair to this small subset of ratepayers, and absent compelling evidence isolating the "costs" that the utilities claim are uniquely not being fairly paid by these customers, the

[25] Ari Peskoe, *Unjust, Unreasonable, and Unduly Discriminatory: Electric Utility Rates and the Campaign Against Rooftop Solar*, 11 Tex. J. of Oil Gas & Energy L. 124-125 (2016) (noting that and citing to numerous sources and courts that have found cost of service studies to be subjective, imprecise, arbitrary, and not accurate enough to establish the exact cost of providing a service to particular class).

Commission should not authorize imposition of any punitive costs or drastic reductions in compensatory credit for fed-in electricity.

The issue the utilities are complaining about is "baked" into the rate design, which averages costs across the entire rate class and inherently creates "winners and losers" in terms of who pays more of the costs of serving the ratepayer class depending on a variety of factors. The solution is not to arbitrarily hold this small subset of ratepayers to a higher standard of paying for "costs of service" than is paid by other ratepayers who are on the receiving end of "cross-subsidies," but to work with all stakeholders to develop a new rate design that alleviates the utilities' overarching concerns about declining usage in general, while protecting ratepayers from ever-increasing costs despite lower per capita usage of electricity. Additionally, issues such as securitization and restructuring as a way to lower utility debt should be considered.

V. The principles of rate design do not support modification of the current net metering crediting rates because the current rate design results in negligible impacts on non-participating ratepayers within that customer class and will remain so for the foreseeable future.

Numerous utility and industry comments submitted thus far allege that there is a cost shift created by crediting customer-generators at the retail rate for the energy they produce and that such a 1:1 credit is a "premium" or excessive cost

the utilities must pay to purchase net metered energy. However, as the analysis provided with the Council's previous comments show, when the difference between the crediting eligible customer-generators at the retail electricity rate or at the avoided cost was calculated for Kentucky utilities based on 2016 data, the total additional "cost" paid to net metering customers was $45,228, or $5,652 per utility, or an average of 4 cents per year, per customer. That analysis considered no benefits that net metering provides to utilities, other customers, the grid, or societal benefits that would reduce these costs even further.

At higher levels of adoption, net metering might become problematic. But, the unsupported claims of cross-subsidization, impacts on low-income ratepayers, and other claims made by other commentators do not ring true and are unsupported by the data. In contrast, penetration rates will remain low in Kentucky for the foreseeable future, bill credits instead of cash payments provide a disincentive to oversize a system, and the 2019 Amendments to the Net Metering Act places a hard 1% cap on net metering.

As such, the current rate design for net metering customers, which charge the customer the same rates as all other customers in the rate class for the energy used and credit the customer at the retail rate for any excess energy sent back to the grid, complies with the principles of rate design that the Kentucky Office of

Energy Policy urged the Commission to apply and which are utilized across the field of utility regulation. First, the current net metering tariffs are simple, understandable to the consumer, have wide-ranging public acceptability (as is evident from public participation in this proceeding), and are easy to apply. There is no controversy over the proper interpretation of the rate. As shown above, any impact to a utility's recovery of its total revenue requirement is negligible, costing the utility an average of $5,652 per year in costs paid for energy fed back to the grid (minus any benefits), plus any lost revenue resulting from decreased usage of approximately 1,125 customers due to their distributed energy systems.

Another principle, revenue stability, further cautions against making drastic changes to a tariff that currently has *little to no impact* on the utility cost recovery of costs of serving the entire ratepayer class. The Commission should avoid dramatic changes as have been seen in some other states, and instead should avoid making significant changes to a rate structure. Principles of gradualism and rate stability caution against unnecessary changes in rates.

In considering rate cases filed after January 1, 2020 and proposing changes in the value of the credit accorded to fed-in electricity from customer-generators, the Commission should bear in mind that all residential customers in each utilities' service area pay the same fixed service charges that are designed to

recover the costs to maintain the grid, including net metering customers. These charges have increased drastically in many service areas in recent years, and utilities continue to request increases in fixed charges for *all* customers to compensate for a lack of customer growth and a reduction in per capita energy usage across the board by ratepayers, a trend that is anticipated to continue.[26] While the costs net metering customers incur for the electricity they consume are offset by the credit for electricity they supply back to the grid, *these credits count only against energy consumed*, not fixed costs of service. Net metering customers pay the same fixed charges as all other residential customers every month, regardless of any credits they receive for energy produced.[27] As the utilities continue to seek upward adjustments in their fixed customer charges and to move costs from the volumetric to the meter charges, any perceived intra-class

[26] *See, e.g.*, *In the Matter of: Electronic Application of Kentucky Utilities Company for an Adjustment of its Electric Rates*, Case No. 2018-00294; *In the Matter of: Electronic Application of Louisville Gas and Electric Company for an Adjustment of Its Electric and Gas Rates*, Case No. 2018-00295.

[27] While the utilities will argue that these fixed costs do not capture the total cost of service and that some costs are built into the volumetric rates, that is not a net metering issue, but an overarching ratemaking issue that implicates the continuing problem of a utility business model built largely around selling increasing amounts of electricity while demand continues to decline. Isolating and according disparate rate treatment for customers who use less electricity because of generation of electricity from solar panels, than is accorded other customers in the same class who may use less electricity due to efficiency investments or weatherization, for example, is hardly fair, just, or reasonable.

"subsidization" will become all the more marginal, and will not justify disparate treatment that singles out customer-generators from other customers who use less electricity that the norm due to conservation measures.

Solar net metering has such low penetration rates in Kentucky, (which under the now "hard" cap of 1% will remain low), that any impact to other ratepayers is *and will remain* negligible, if not undetectable. The Kentucky Resources Council did an analysis of the economic impact on residential customers from net-metered energy sold back to the grid at retail rates using 2016 data from the Department of Energy's Energy Information Administration. The analysis looked at the cost to each utility for crediting net metering customers at the retail rate rather than the avoided cost rate, with an assumed difference between the two of roughly seven (7) cents per kilowatt hour, for excess power supplied to the grid. Contrary to the utilities' arguments that crediting net metering customers at the retail rate results in significant cross-subsidization, our analysis found that for 2016, the economic impact for any non-participating customer ranged from a high of 4 cents per month, or 48 cents per year, to a low of 0.1 cents per month, or 1.3 cents per year. The average economic impact on non-participating customers was 4 cents per year. Thus, while the utilities argue

that cost shifting is occurring in some jurisdictions, the reality in Kentucky is that any cost-shift or cross-subsidization is negligible.[28]

A January 2017 study by the Lawrence Berkley National Laboratory confirms this analysis on a nationwide level.[29] According to this report, at a solar net-metering penetration rate of 0.4% and with purely volumetric rates, the impact to average retail electricity prices is no more than three one-hundredths of one cent per kWh. Kentucky currently has a distributed solar penetration rate of less than 0.1% and utilities charge a fixed rate which is not subject to reduction through net metering, in addition to volumetric rates. This means the impact to retail electric prices in Kentucky should be even lower than projected in this report for the foreseeable future. Furthermore, because the 2019 Net Metering Act caps net metering at 1% of a utility's peak load, utility companies are not required to offer net metering when penetration rates rise to a level where retail rate net metering is projected to have impacts on non-participating ratepayers.

[28] Tom FitzGerald, "The Economic Impact on Kentucky Residential Customers of Energy 'Sold' To Utilities From Net Metering Solar Customers in 2016," (February 28, 2018) annexed as Attachment 4.

[29] Galen Barbose, "Putting the Potential Rate Impacts of Distributed Solar into Context" (Lawrence Berkeley National Laboratory, Jan. 2017) available at: https://emp.lbl.gov/sites/all/files/lbnl-1007060.pdf

Further, while Kentucky utilities may have a monopoly in their service territories, that monopoly status does not prohibit customers from seeking to reduce their energy consumption or reliance on energy from the grid. Utility customers have always had the option to take whatever measures they see fit to control their own energy use and reduce their bills by using less energy. To compensate net metering customers at anything less than the retail rate for energy they produce, and which is used behind the meter to reduce their own energy consumption is contrary to this principle and treats net metering customers differently than all other customers that seek to reduce their energy usage. This is unreasonable, unfair, and contrary to longstanding ratemaking principles.

In conclusion, the utility industry's argument that solar net-metering customers are not paying their fair share to upkeep the grid and that their decreased energy usage and utility credits they receive for energy produced are creating an unfair burden on other ratepayers is simply not true in Kentucky. As the analysis above makes clear, there is no need to raise rates on net metering customers to recover for any cross-subsidization because net metering customers' effect on other customers is negligible. Imposing additional fixed costs on net metering customers above what other ratepayers pay or putting net

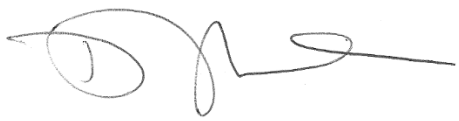
metering customers in a separate rate class is contrary to the requirement that rates be fair, just, and reasonable, and is not supported by any evidence provided by the utilities to date. Any assertion by the utilities that cost shifts are occurring or that net metering customers impose additional costs on utilities must be supported by valid, transparent data, and must be disaggregated from other intra-class "cross-subsidization" that is inherent and is "baked in" to a rate structure that blends high and low costs of service into an aggregated cost that is manifested in fixed meter and a portion of volumetric charges.[30]

CONCLUSION

The Council appreciates this opportunity to provide supplemental oral and written comments in response to the Commission's invitation for public comment.

[30] Note also that cross-subsidization within a class is inherent in flat rate electricity pricing. Ahmad Faruqui, *The Ethics of Dynamic Pricing*, 23 Electricity J. 13, 19 (July 2010) ("A flat rate that charges the same price around the clock essentially creates a cross subsidy between consumers that have flatter-than-average load profiles and those that have peakier-than-average load profiles. This cross subsidy is invisible to most consumers but over a period of time it can run into the billions of dollars.").

Respectfully submitted,



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