

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

ELECTRONIC CONSIDERATION OF THE	)	
IMPLEMENTATION OF THE NET METERING	)	CASE NO. 2019-00256
ACT	)	

**INITIAL COMMENTS OF KENTUCKY POWER COMPANY**

The Public Service Commission of Kentucky (“Commission”) initiated this administrative proceeding to consider the implementation of Senate Bill 100, An Act Related to Net Metering (“Net Metering Act”), which takes effect on January 1, 2020. The Commission requested comments from interested utilities and stakeholders to develop a record on which the Commission can draw as it considers implementation of the Net Metering Act.<sup>1</sup> Kentucky Power Company appreciates the opportunity to provide the following initial comments.

**Introduction**

The Net Metering Act mandates that each retail electric supplier is “entitled to implement rates,” set by the Commission using the ratemaking processes under KRS 278.466, that recover from the retail electric supplier’s Eligible Customer-Generators<sup>2</sup> “all costs necessary to serve its eligible customer generators, including but not limited to fixed and demand-based costs, without regard for the rate structure for customers who are not eligible customer-generators.”<sup>3</sup> Several of Kentucky Power’s current rates, and in particular the rates offered under Tariff N.M.S.<sup>4</sup> (Net Metering Service) fall short of the Net Metering Act’s express requirements. These rates must be modified so that Eligible Customer-Generators pay *all* costs required to serve them.

---

<sup>1</sup> Order at 1 (July 30, 2019).

<sup>2</sup> Eligible Customer-Generators are defined under the Net Metering Act at KRS 278.465(1).

<sup>3</sup> KRS 278.466(5)(emphasis added).

<sup>4</sup> P.S.C. Ky. No. 11 Original Sheet Nos. 27-1 through 27-22.

Volumetric-based charges generally are inconsistent with the Net Metering Act's requirement that Eligible Customer-Generators be charged rates that recover the cost of providing service to these customers.<sup>5</sup> Rates for a particular class that are designed to recover costs primarily through volumetric-based charges can, and unfortunately almost invariably do, result in intra-class and inter-class cross-subsidization. The intra-class subsidy arises because Eligible Customer-Generators can reduce the volumetric portion of their electric bill (*i.e.*, the energy portion of the bill, measured in kWh) in any particular month, sometimes dramatically, and thereby avoid paying the full cost of serving them. This is because the volumetric charge that they are avoiding includes fixed costs that are not avoided by the utility. In addition, inter-class subsidies result from the allocation or reallocation of fixed costs from one class of customers to all others.<sup>6</sup>

Kentucky Power supports the development and deployment of Eligible Electric Generating Facilities ("EEGF") for electric utilities and their customers, as long as one customer's decision to install an EEGF system does not negatively impact Kentucky Power's other customers. Under existing ratemaking paradigms, the rates paid by Kentucky Power's Eligible Customer-Generators reflect significant inter-class and intra-class cost shifting among customers. As a result, non-Eligible Customer-Generators have been left to bear the costs the Net Metering Act requires Eligible Customer-Generators to pay.

Because of the recognition of cost-shifts resulting from net metering practices, among other reasons, a number of states are currently pursuing or exploring net metering reform. Many of these

---

<sup>5</sup> See S.B. 100 at Section 2 (new KRS 278.466(5)).

<sup>6</sup> See *e.g.* *In the Matter of: Electronic Application Of Kentucky Power Company For (1) A General Adjustment Of Its Rates For Electric Service; (2) An Order Approving Its 2017 Environmental Compliance Plan; (3) An Order Approving Its Tariffs And Riders; (4) An Order Approving Accounting Practices To Establish Regulatory Assets Or Liabilities; And (5) An Order Granting All Other Required Approvals And Relief*, Case No. 2017-00179 at 46 (Ky. P.S.C. Jan. 18, 2018) ("The results of the COSS illustrate the amount of cross-subsidization between the rate classes and show that all non-residential rate classes subsidize the residential class.").

states have made modifications to compensation for distributed generation customers, or are reviewing how tariffs and rates should be designed for net metering customer-generators.<sup>7</sup> Within this context, the General Assembly of the Commonwealth of Kentucky, in its 2019 regular session, enacted the Net Metering Act.<sup>8</sup> In the instant proceeding, the Commission is evaluating how to effect the Legislature's mandate in the Net Metering Act, in which the General Assembly properly recognizes that net metering should not cause non-generating customers to bear more than their fair share of system costs.

Kentucky Power proposes two alternative approaches to accomplish this mandate. Under the first approach, a demand charge would be added to bills of net metering customer-generators. This demand charge would include demand charges and other appropriate fixed costs incurred to accommodate net metering customer-generators. Under the second approach, net metering customer-generators would sell all of the energy that their distributed generation facilities produce at a market-based rate and then purchase, under an existing tariff, all of the power that they use.

### **Subsidization in Kentucky Power's Rates**

Kentucky Power's Net Metering Service tariffs currently create subsidization within individual customer classes, particularly among members of the residential class, which would be inconsistent with the mandates of the Net Metering Act. Accordingly, the applicable tariffs must be revised to eliminate this subsidization. In the following sections of these comments, Kentucky Power sets forth the manner in which its rates and tariffs create subsidization and the effect that this subsidization can have on customers over the long term.

---

<sup>7</sup> Net metering reform is taking or has taken place in a majority of states as of October 15, 2019.

<sup>8</sup> See S.B. 100.

### Costs Directly Incurred to Accommodate Net Metering Systems

Subsidization is defined as “the recovery of costs from one class of customer ... that is attributable to another.”<sup>9</sup> It also involves, as is the case with Eligible Customer-Generators, the recovery of costs of serving a subset of a rate class from other members of the class. To remove the subsidization and meet the Net Metering Act’s mandate, it is necessary to identify the costs directly incurred by the electric utility in accommodating a net metering system, and then to design rates and tariffs that ensure that these costs are paid for by the customer-generators themselves.

Kentucky Power has identified two distinct types of costs that are directly incurred to accommodate net metering systems. The first type of costs consists of the capacity costs (*i.e.*, fixed costs) directly incurred for infrastructure, including generation, transmission, and distribution equipment needed to provide service to Eligible Customer-Generators (“Net Metering Capacity Costs”).<sup>10</sup> Kentucky Power’s co-generation Eligible Customer-Generators produce much of the power that they use but rely on Kentucky Power for back up and maintenance service when their co-generation is not in operation or is insufficient to meet their full requirements. Such industrial back up power is rarely used for more than a few hours each year. By contrast, utility-provided electric service for residential Eligible Customer-Generators is likely to be used multiple times each day for a number of hours.

The second type of costs consists of those costs required to interconnect an EEGF to Kentucky Power’s system (“Net Metering Interconnection Costs”). Net Metering Interconnection Costs include administrative, planning, and analytical costs associated with the interconnection, as well as other non-Net Metering Capacity Costs necessary to serve eligible customer-

---

<sup>9</sup> *In the Matter of: An Investigation Of The Need For Affiliate Transaction Rules And Cost Allocation Requirements For All Jurisdictional Utilities*, Administrative Case No. 369, App. A at 1 (Ky. P.S.C. Dec.20, 1999).

<sup>10</sup> In the case of industrial co-generation customers these costs take the form of back up and maintenance service and are recovered through demand charges.

generators. Depending on the size of the EEGF, these costs on average can range from approximately \$600 to approximately \$7,500.

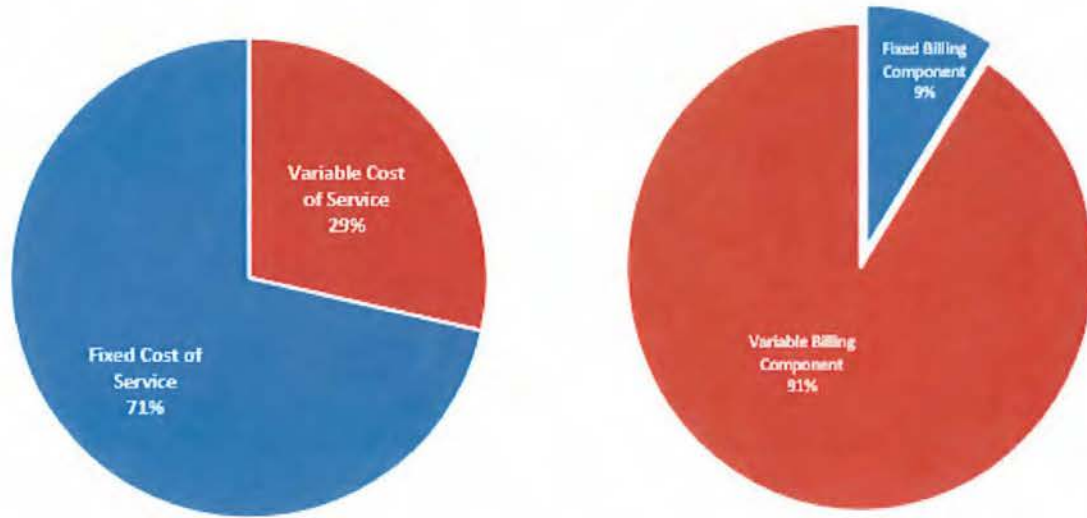
### Subsidization in Kentucky Power's Rates

Subsidization has the most pronounced effect in the rates of residential customers. Kentucky Power serves approximately 134,000 residential customers in Kentucky. The rates of these customers are based on a rate design that has been largely unchanged for decades. Residential rates are designed to recover Kentucky Power's fixed costs of service through a mostly variable energy charge (dollar per kilowatt-hour or "\$/kWh") and a disproportionately small fixed monthly customer charge. The fixed monthly customer charge (currently \$14.00, \$16.00, or \$17.50) has remained low over time in comparison to the cost of connecting the next residential customer to Kentucky Power's distribution system.<sup>11</sup> Variable energy charges have been used to recover the vast majority of Kentucky Power's costs to serve the residential class as a means of encouraging conservation by its customers. Significantly, there is little relationship between fixed to variable *rate components* and fixed to variable *costs* to serve residential customers. Figure 1 below demonstrates this difference between Kentucky Power's fixed and variable rate components and Kentucky Power's fixed and variable costs to serve.

---

<sup>11</sup> Company Witness Vaughan testified in Kentucky Power's most recent rate case that the monthly cost of connecting the next residential customer to the Company's distribution system is approximately \$39.00. *In the Matter of: Electronic Application Of Kentucky Power Company For (1) A General Adjustment Of Its Rates For Electric Service; (2) An Order Approving Its 2017 Environmental Compliance Plan; (3) An Order Approving Its Tariffs And Riders; (4) An Order Approving Accounting Practices To Establish Regulatory Assets Or Liabilities; And (5) An Order Granting All Other Required Approvals And Relief*, Case No. 2017-00179, Direct Testimony of Alex E. Vaughan, at 46 (Ky. P.S.C. Filed June 28, 2017).

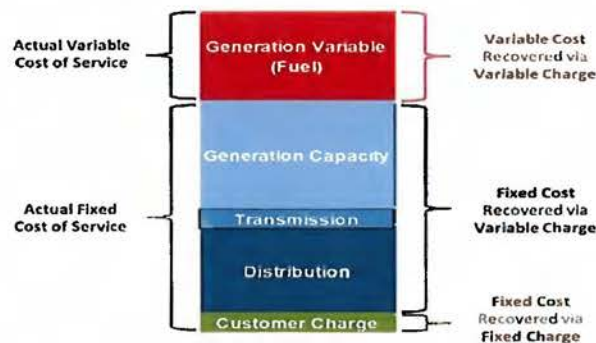
**Figure 1. Difference Between Fixed/Variable Costs and Billing Components**



This difference, whereby the utility recovers fixed costs through a variable charge, is the source of intra-class subsidization that results under the Company’s existing Net Metering tariff. Eligible Customer-Generators have the ability to reduce the amount paid through volumetric rates (and thus the contribution made by such rates to recovering fixed costs) yet the fixed costs of providing the service remains unchanged. These unrecovered fixed costs ultimately are shifted to non-Eligible Customer-Generators.

Below, Figure 2 offers a more granular representation of how Kentucky Power collects fixed and variable costs of service from the average Kentucky residential customer.

**Figure 2. Kentucky Power Residential Fixed and Variable Cost Recovery by Cost Type**



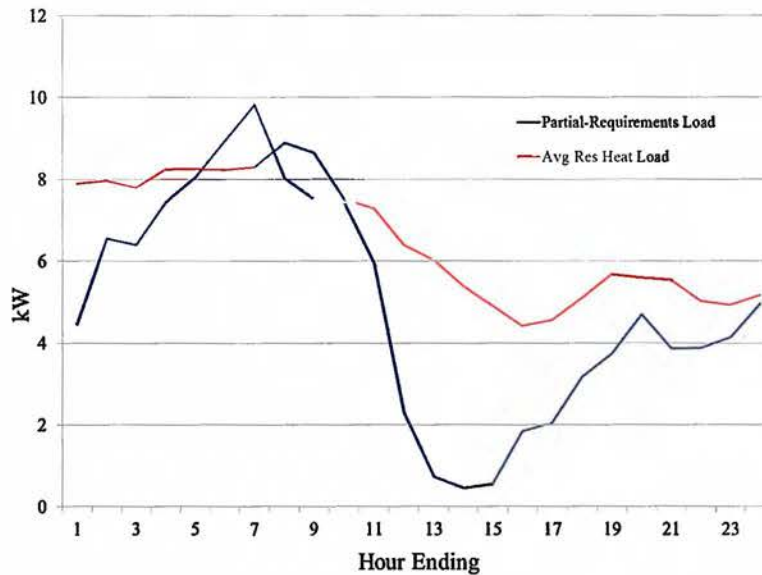
When a customer installs an EEGF system and yet remains connected to the utility's electrical network, this customer becomes fundamentally different from the rest of the customers in that rate class. Such customers become "partial-requirements" customers and no longer rely on the utility for all of their electrical energy requirements. These partial-requirements customers have load shapes that are significantly different from the load shapes of other customers. They use the electrical network as a "two-way street," meaning they not only partially supply their own electrical requirements, but also export excess energy to Kentucky Power (notably, at certain intermittent times, and not necessarily when needed by Kentucky Power to supply service to all customers). Under the Company's existing tariffs, net metering customer-generators effectively use Kentucky Power's electrical network to "store" energy on their bills when their exports exceed their imports over a billing period.<sup>12</sup>

A net metering customer-generator's load shape is dependent not only on its normal usage patterns, but also on the weather and the technology used to generate energy. Figure 3 below shows the load shape of a representative "partial-requirements" solar Eligible Customer-Generator in the service territory of Kentucky Power's affiliate, Appalachian Power Company, compared to a more traditional full-requirements customer on Appalachian Power's peak day. Appalachian Power's customers are demographically comparable to those of Kentucky Power and provide a reasonable basis for comparison (Appalachian Power's service territory is also used for the data in Figures 4, 5, and 6). The representative solar Eligible Customer-Generator is assumed to have installed both roof-mounted (southwest facing) and ground-mounted (south facing) solar panels totaling approximately 10 kW of AC capacity.

---

<sup>12</sup> See Tariff N.M.S., Sheet 27-1 ("If the customer's net energy is negative during a billing period, the customer shall be credited in the next billing period for the kWh difference.")

**Figure 3. Load Profiles for the Representative Customer-Generator vs. Average Residential Heat Customer on Appalachian Power's Winter Peak Day**

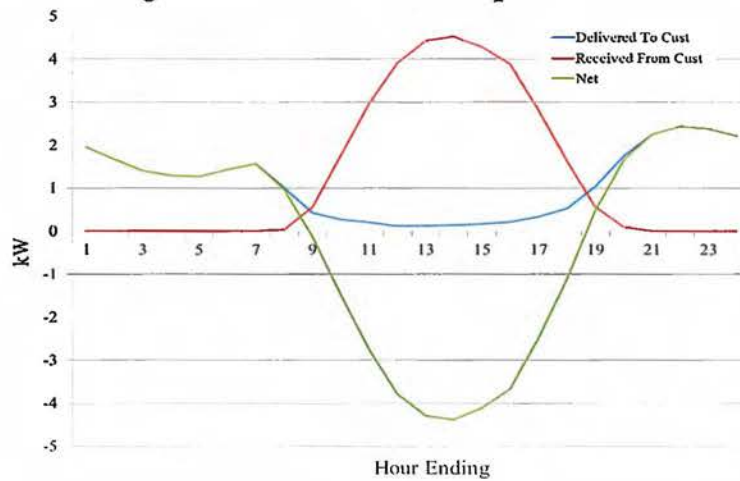


As can be seen above, both customers' peak loads occur in the early morning hours when the sun has not yet risen or is very low in the sky. Between the hours of 11:00 a.m. and 3:00 p.m., when the sun is high, the solar Eligible Customer-Generator's net load falls to nearly zero. As the sun sets, the solar Eligible Customer-Generator's load increases back up towards the average.

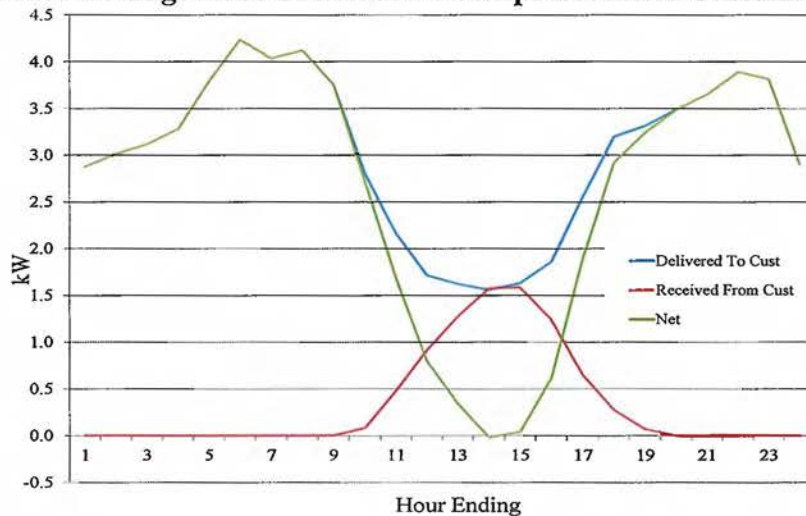
Figures 4 and 5 below show how the solar Eligible Customer-Generators have a significantly different load shape during the summer and winter. In the summer, the solar Eligible Customer-Generators export energy for a few midday hours and effectively use the network as a "two-way street." In the winter, presuming that weather conditions are favorable, the solar Eligible Customer-Generators may generate some energy during the shorter daylight hours, but do not likely generate any energy during times of peak demand. Even so, solar Eligible Customer-Generators are able to make use of, and receive a bill credit for, the energy that they "stored" during the summer months.



**Figure 4. Summer Average Load Profile for the Representative Customer-Generator**



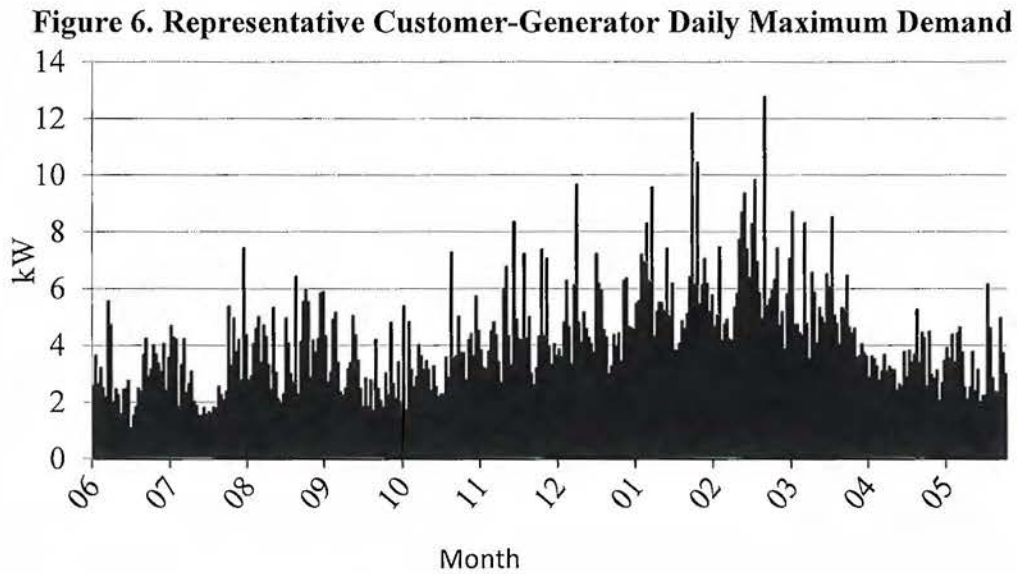
**Figure 5. Winter Average Load Profile for the Representative Customer-Generator**



These significantly different load shapes distinguish the needs of residential solar Eligible Customer-Generators from the needs of other customers, including, for example, those of customers that use energy efficiency measures to reduce their loads.

Under the above examples, the solar Eligible Customer-Generators can net their energy consumption to zero (or be a net seller of energy) in some billing periods, but that does not mean that the solar Eligible Customer-Generators go “off the grid” or disconnect from the utility network. These solar Eligible Customer-Generators receive energy from the utility’s network

every day of the year. This can be seen in Figure 6 below, which shows the peak daily demand imposed on the network by a solar Eligible Customer-Generator.



Even though the Representative Customer-Generator requires energy at some time every day to maintain reliable service, this Representative Customer-Generator only pays a minimal \$14.00-\$17.50/month fixed monthly customer charge and, therefore, does not pay appropriately for its use of the utility’s network. Table 1 below shows this monthly billing information.

**Table 1. Representative Customer-Generator Bill Example**

Month	Energy Delivered to Customer	Energy Received from Customer	Net Energy	Billed Energy	Total Bill
June	740	1,055	(315)	-	\$ 14.00
July	745	960	(215)	-	\$ 14.00
August	820	960	(140)	-	\$ 14.00
September	965	895	70	-	\$ 14.00
October	635	820	(185)	-	\$ 14.00
November	1,065	470	595	-	\$ 14.00
December	1,805	300	1,505	1,205	\$135.21
January	2,270	205	2,065	2,065	\$221.68
February	2,215	135	2,080	2,080	\$223.19
March	2,490	240	2,250	2,250	\$240.28
April	1,670	695	975	975	\$112.08
May	920	860	60	60	\$ 14.76

Table 1 also shows that the solar Eligible Customer-Generator is able to “store” excess energy generated during these billing periods and use it to offset consumption (at the full \$/kWh variable rate) in future billing periods.

During the billing periods in which the production of the solar Eligible Customer-Generator’s partial requirements system is greater than their load, the utility “purchases” this excess customer-generated energy (at about 10 cents/kWh). By “purchasing” this customer-generated energy, the utility does not purchase (or generate) a comparable amount of market-priced energy (at about 4 cents/kWh). In subsequent months, when the solar Eligible Customer-Generator is a net consumer of energy, the solar Eligible Customer-Generator is able to make use of the “stored” bill credit from the excess energy that it has produced in prior months. This bill credit is applied at the full volumetric rate (about 10 cents/kWh). To put it differently, the over-generation by this Representative Customer-Generator requires its full requirements neighbors eventually to pay more than double the market price for this energy.

#### *Misalignment of Incentives*

The two-component rate design employed for the residential class encourages net metering customer-generators to maximize energy production – without regard for when or how their energy is put onto the network. Solar panels oriented southeast would generate energy earlier in the day. Solar panels oriented southwest would generate energy primarily in the afternoon hours. Solar panels oriented due-south offer the greatest overall energy production (and thus the largest bill credit), but generate less energy in the morning or evening, when that energy would be most beneficial to the grid.

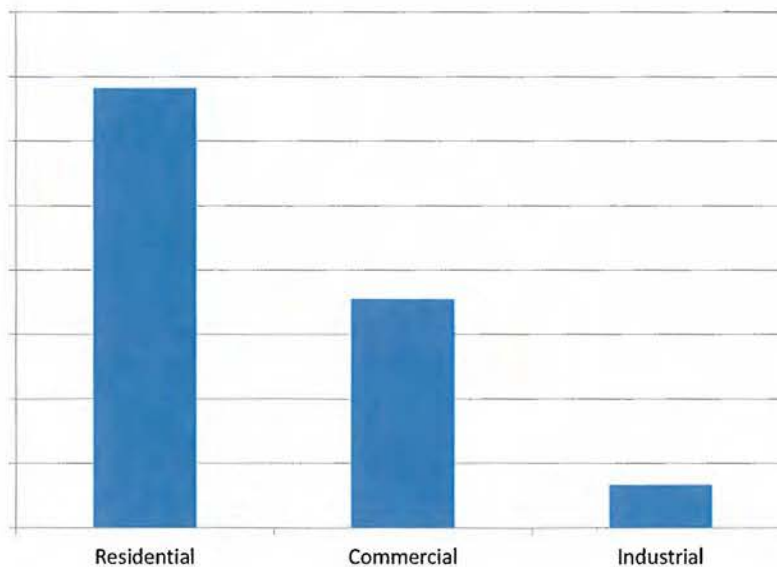
In addition to solar panel orientation, the current net metering rate design provides no incentive for other technologies like energy storage to be deployed. The current model provides

solar Eligible Customer-Generators with free on-demand “energy storage” on the network. This means that installing energy storage and other load control technologies – which have the potential to reduce costs to serve customers by reducing peak demands – is currently a poor economic decision for residential solar Eligible Customer-Generators.

### Commercial and Industrial Rate Design

Kentucky Power’s rates and tariffs also create subsidization for commercial and industrial Eligible Customer-Generators. For these customers, subsidization is partially mitigated by demand charges that capture a greater portion of the fixed cost of providing service; however, subsidization remains because certain fixed costs are recovered through variable energy charges in these customer classes. Figure 7 below shows the level of fixed costs recovered through energy charges for residential, commercial, and industrial customers.

**Figure 7. Relative Fixed Costs Recovered via kWh Charge by Customer Class**



### Effects of Subsidization

Subsidization has significant effects on Kentucky, its electric utilities, and their customers. Lower income customers bear a disproportionate amount of the burden of this subsidization. When

individual residential customers make the decision to become Eligible Customer-Generators, these individual customers are typically making large financial commitments – often totaling tens of thousands of dollars. In the Company’s general experience, customers who can afford to buy or finance these systems have been found to be earning well above median incomes. Accordingly, the end result of the subsidization is a cost-shift that disproportionately assists high-income customers, and negatively impacts low-income customers.

### **Eliminating Subsidization in Kentucky Power’s Electric Rates**

Because Kentucky Power’s current rates and tariffs fail to recover the full cost of providing service to Eligible Customer-Generators from Eligible Customer-Generators, particularly residential customers, and thereby requiring other customers to cover such costs, and because such subsidization is now impermissible under Kentucky law, action must be taken to eliminate subsidization from Kentucky Power’s rates and tariffs.

As noted, Kentucky Power regards it as possible to prevent subsidization in rates and tariffs in two ways. Accordingly, Kentucky Power proposes for the Commission’s consideration two options for satisfying the legislative mandate of the Net Metering Act. These options are described below.

1. Net metering customer-generators could be placed into their own rate class and an appropriate cost-based rate designed for that unique class of customers. Rather than a two-component residential rate (monthly customer charge and energy charge), a new three-component rate (which would include a demand charge) would be designed specifically for unique aspects of net metering customer-generators. This type of rate is well accepted and commonly used for all larger commercial and industrial customers, and aligns the cost collection mechanism with the nature of the costs. For example, a monthly fixed service charge would be designed to recover certain non-usage based costs like metering and billing, or other associated Net Metering Interconnection Costs. Second, a demand-based charge would be designed to recover capacity-related costs (including without limitation Net Metering Capacity Costs) associated with the distribution system, transmission system, and the fixed costs associated with having adequate on-demand generation capacity. Third, a volumetric

kilowatt-hour charge would be designed to recover the variable cost of energy (primarily generation fuel). Under this approach, to the extent the customer's generation reduces its demand and energy usage, the customer would receive appropriate credits for the actual reductions achieved.

2. Net metering customer-generators could sell all of the energy generated by their systems at market-based prices and continue to purchase all of their usage under the appropriate existing tariff (*e.g.*, residential, etc.). This solution would require two meters (one being a two-way meter) to be able to identify separately the customer's generator output from the customer's usage or load. The customer would remain on its existing tariff and receive a bill for usage as it does currently. The generator would be separately metered, and all energy generated by the customer would be purchased by the utility at a market-based price. The usage charges and credits for energy sales would be financially netted on the customer's monthly bill.

The simplicity of this method is evident. The customer's usage charges are computed in the same way before and after the installation of the generator. The customer is credited at market price for the output of the generation. These two activities are routinely performed and overseen by the Commission – designing rates for standard customer classes and monitoring market-based purchases of energy. A time-based market price could provide the additional benefit of encouraging the customer to generate energy when it is most needed – during the morning and evening seasonal peaks.

Under either of these options, the Eligible Customer-Generator would be responsible for any investment in facility modifications that are a direct result of the generator installation, including items such as metering changes, circuit impact studies, telemetry, and other site specific costs. If properly designed, either of these solutions would meet the objective set forth by the General Assembly.

Respectfully submitted,



---

Mark R. Overstreet  
Katie M. Glass  
STITES & HARBISON PLLC  
421 West Main Street  
P. O. Box 634  
Frankfort, Kentucky 40602-0634  
Telephone: (502) 223-3477  
Facsimile: (502) 779-8349  
[moverstreet@stites.com](mailto:moverstreet@stites.com)  
[kglass@stites.com](mailto:kglass@stites.com)

COUNSEL FOR KENTUCKY POWER  
COMPANY