

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

**In the Matter of:**

**ELECTRONIC APPLICATION OF KENTUCKY )  
UTILITIES COMPANY FOR AN ADJUSTMENT )  
OF ITS ELECTRIC RATES, A CERTIFICATE OF )  
PUBLIC CONVENIENCE AND NECESSITY TO )  
DEPLOY ADVANCED METERING ) **Case No. 2020-00349**  
INFRASTRUCTURE, APPROVAL OF CERTAIN )  
REGULATORY AND ACCOUNTING )  
TREATMENTS AND ESTABLISHMENT OF )  
A ONE YEAR SUR-CREDIT )**

**AND**

**ELECTRONIC APPLICATION OF LOUISVILLE )  
GAS AND ELECTRIC COMPANY FOR AN )  
ADJUSTMENT OF ITS ELECTRIC AND GAS )  
RATES, A CERTIFICATE OF PUBLIC )  
CONVENIENCE AND NECESSITY TO DEPLOY ) **Case No. 2020-00350**  
ADVANCED METERING INFRASTRUCTURE, )  
APPROVAL OF CERTAIN REGULATORY AND )  
ACCOUNTING TREATMENTS AND )  
ESTABLISHMENT OF A ONE YEAR SUR-CREDIT)**

**SUPPLEMENTAL DIRECT TESTIMONY OF KARL R. RÁBAGO  
ON BEHALF OF JOINT INTERVENORS**

Tom FitzGerald  
Kentucky Resources Council, Inc.  
P.O. Box 1070  
Frankfort, KY 40602  
(502) 875-2428  
FitzKRC@aol.com  
Counsel for Joint Intervenors Kentucky  
Solar Energy Society, Kentuckians For The  
Commonwealth, Mountain Association  
(Case No. 2020-00349) and Metropolitan  
Housing Coalition (Case No. 2020-00350)

July 13, 2021

1 **INTRODUCTION AND OVERVIEW**

2 **Q. Please state your name, business address, and affiliation.**

3 A. My name is Karl R. Rábago. I am principal of Rábago Energy LLC, a Colorado limited  
4 liability company. My address is 2025 East 24<sup>th</sup> Avenue, Denver, Colorado.

5 **Q. Are you the same Karl R. Rábago who previously testified in this proceeding?**

6 A. Yes.

7 **Q. What is the purpose of your testimony?**

8 A. My supplemental testimony relates to avoided energy cost, ancillary services cost,  
9 generation capacity cost, transmission capacity cost, distribution capacity cost, carbon  
10 cost, environmental compliance cost, and job benefits as they relate to calculating the  
11 export compensation rates for net metering facilities under a Commission-approved Net  
12 Metering Service-2 (“NMS-2”) tariff for Kentucky Utilities (“KU”) and Louisville Gas  
13 and Electric Company (“LG&E”) (jointly, the “Companies”). In general, this testimony  
14 supports the Commission following the same approach and adopting the same  
15 methodology (“Commission NMS Methodology”) for setting the NMS-2 compensatory  
16 credit rate as it used in its order entered on May 14, 2021, in the Kentucky Power  
17 Company (“KPC”) case.<sup>1</sup> However, I recommend that additional avoided cost  
18 components be included in the benefit-cost analysis, to provide an even more  
19 comprehensive assessment of the value that distributed energy resources provide to the  
20 utilities and ratepayers. In addition, the testimony recommends that the Commission  
21 order the Companies to produce adequate and reliable data to enable application of the  
22 Commission NMS Methodology and the development of a just and reasonable

---

<sup>1</sup> Order, Case No. 2020-00174, May 14, 2021.

1 compensation rate for exports. Finally, this testimony recommends that the Commission  
2 reference the methods and values set out in the meta-analysis of value of solar studies  
3 authored by Hayibo and Pearce<sup>2</sup> cited by the Commission in its May 14 Order in the KPC  
4 case as the source for any credible and reliable data that the Companies fail to provide.

5 **Q. How does this testimony relate to your previously filed testimony in this proceeding?**

6 A. This supplemental testimony aligns with my prior testimony in supporting a tariff that is  
7 fair, just, and reasonable as required by Kentucky law and policy. As such, I continue to  
8 urge the Commission to reject the NMS-2 compensation rate proposal from the  
9 Companies as unfair, unjust, unreasonable, and unsupported by competent evidence.

10 **THE COMMISSION SHOULD APPLY THE COMMISSION NMS METHODOLOGY IN**  
11 **THESE CASES**

12 **Q. What methodology should the Commission adopt in setting the compensatory credit**  
13 **rate for net metering exports under the Companies' NMS-2 tariffs?**

14 A. The Commission should apply the methodology that it established in the KPC case to  
15 calculating the net metering export compensatory credit rates under the Companies'  
16 NMS-2 tariff. That methodology, including the netting period and rate design and  
17 avoided cost rate calculation is consistent with the law and will ensure a compensation  
18 rate that is just, fair, and reasonable. As in the KPC case, the methodology used to set the  
19 export compensation rates for the Companies' net metering customers should be based on  
20 billing cycle netting of production and use and should be forward-looking and address the  
21 full operating life values for avoided energy, generation capacity, transmission capacity,  
22 ancillary services, distribution capacity, carbon, and environmental compliance costs, and

---

<sup>2</sup> Hayibo, Koami Soulemene & Pearce Joshua, *A Review of the Value of Solar Methodology with a Case Study of the U.S. VOS*, Renewable and Sustainable Energy Reviews, 137(2): 110599 (2021), cited at p. 23, fn. 71, in Commission Order dtd. May 14, 2021 in Case No. 2020-00174.

1 job benefits. The avoided cost values proposed by the Companies must be adjusted based  
2 on errors and missing data.

3 **Q. The Commission adopted principles for compensation of eligible customer-**  
4 **generators in the KPC case. Do you recommend that the Commission adopt and**  
5 **apply those principles in these cases as well?**

6 A. Yes.

7 **Q. Do you also recommend application of the Commission NMS Methodology to the**  
8 **NMS tariffs for commercial net metered customers served by the Companies?**

9 A. Yes.

10 **Q. Do you recommend any changes to the Commission NMS Methodology from what**  
11 **was applied in the Kentucky Power Company case?**

12 A. Yes. Additional components should be included in the calculation of the avoided cost of  
13 distributed solar resources. In the Kentucky Power Company case the commission  
14 established an important framework for conducting a cost-benefit analysis for distributed  
15 solar resources. However, this framework excluded several significant components of  
16 value which have been identified in other studies and states. Table 2 compares the value  
17 of solar components used in the Kentucky Power Case, the Minnesota VOS Methodology  
18 (2014), and the analysis of US VOS methodologies conducted by Hayibo and Pearce  
19 (2021).

Table 1 – Comparison of Components Included in Three Value of Solar Frameworks		
KyPSC/ KyPowerCo Method	Minnesota VOS <sup>3</sup>	Hayibo & Pearce <sup>4</sup>
Energy	Fuel Cost	Fuel
	Plant O&M – fixed	O&M - fixed
	Plant O&M – variable	O&M - variable
Generation Capacity	Generation Capacity	Generation Capacity
	Reserve Capacity	Reserve Capacity
Transmission Capacity	Transmission Capacity	Transmission Capacity
Distribution Capacity	Distribution Capacity	Distribution
Environmental Compliance	Environmental (includes carbon)	Environmental (includes carbon)
Carbon Cost		
	Voltage Control	
	Solar Integration Cost	
		Health liability
Ancillary Services		
Job Benefits		

1  
2 Table 1 shows that some value components were excluded from the PSC’s framework in  
3 the Kentucky Power Company case, including:

- 4
- Operations & Maintenance – Fixed and Variable
  - 5 • Reserve Capacity
  - 6 • Voltage Control – noted/not included in the original Minnesota VOS methodology
  - 7 • Solar Integration Cost – noted/not included in original Minnesota VOS methodology.

---

<sup>3</sup> Minnesota Department of Commerce, Division of Energy Resources, *Minnesota Value of Solar: Methodology*, April 1, 2014, p. 21. See <https://mn.gov/commerce-stat/pdfs/vos-methodology.pdf>.

<sup>4</sup> Hayibo & Pearce, *ibid.*

- 1 • Health Liability

2 In the interest of producing the most fair, just, and reasonable rates, I recommend that  
3 these additional factors be included within the Kentucky PSC’s benefit-cost analysis  
4 framework. Both the Minnesota method and the Hayibo study provide detailed guidance  
5 for calculating the value of solar for each of these components, as well as references to  
6 input data sources.

7 It should be noted that the Kentucky PSC framework included two categories which were  
8 not included in the other two frameworks, ancillary services and jobs benefits. The  
9 commission was correct to include these elements and they should be retained among the  
10 components analyzed to determine a fair, just, and reasonable value for solar exports.

11 **Q. Why is it important that the Commission apply its Commission NMS Methodology**  
12 **to all jurisdictional electric utilities in Kentucky?**

13 A. The distributed generation industry in Kentucky is small but poised for significant  
14 growth. Businesses participating in the industry, including suppliers, technical firms,  
15 installers, and service firms do not operate in franchised service territories as regulated  
16 monopolies and must capture business opportunities wherever they arise. Differences in  
17 net metering export compensation methodologies will create unnecessary barriers to  
18 business development, confusion for customers, and significant potential for  
19 discriminatory treatment by utilities. For these reasons, the methodology for calculating  
20 the export credit should be uniform across the Kentucky market.

21 **Q. Does that mean that the value of the export credit should be the same everywhere in**  
22 **Kentucky?**

1 A. No. I support the Commission’s approach of using an avoided cost framework for  
2 calculating the export compensation credit. It is the approach that I relied upon in  
3 establishing the first Value of Solar Tariff, and remains a valid approach for establishing  
4 fair, just, and reasonable net metering tariffs, so long as full avoided costs and benefits  
5 are objectively and comprehensively quantified.<sup>5</sup> A full avoided cost method means that  
6 the resulting rates in the net metering tariff may differ by utility. Using utility-specific  
7 data ensures equity between the utility, net metering customers, and non-net metering  
8 customers. As my co-author, Jason Keyes, and I summarized in *A Regulators Guidebook:  
9 Calculating the Benefits and Costs of Distributed Solar Generation* almost a decade ago,  
10 “[W]hile calculated values will differ from one utility to the next, the approach used to  
11 calculate the benefits and costs of distributed solar generation should be uniform.”<sup>6</sup>

12 **THE COMMISSION SHOULD ORDER THE COMPANIES TO PRODUCE DATA TO**  
13 **ENABLE APPLICATION OF THE COMMISSION NMS METHODOLOGY**

14 **Q. Have the Companies produced credible and competent evidence to support the**  
15 **application of the Commission NMS Methodology and the determination of a fair,**  
16 **just, and reasonable net metering compensation rate in this proceeding?**

17 A. No. The Companies failed to provide credible and competent evidence or to propose a  
18 transparent, fair, just, and reasonable methodology for establishing a compensation rate.  
19 This failure should not inure to the disadvantage of customer-generators and does not  
20 serve to shift the burdens of production or proof to other parties.

---

<sup>5</sup> Karl R. Rábago, *The ‘Value Of Solar’ Rate: Designing an Improved Residential Solar Tariff*, Solar Industry, Feb. 2013, <http://digitalcommons.pace.edu/lawfaculty/951/>.

<sup>6</sup> Jason B. Keyes & Karl R. Rábago, *A Regulators Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation*, Interstate Renewable Energy Council (Oct. 2013), at p. 7. Available at: <https://irecusa.org/publications/a-regulators-guidebook-calculating-the-benefits-and-costs-of-distributed-solar-generation/>.

1 **Q. What should the Commission do to address the data and analysis deficiencies in the**  
2 **Companies' NMS-2 proposals?**

3 A. The Commission has already taken the most important step by ordering a discovery  
4 process as part of this Supplemental Proceeding.

5 **Q. What should the parties do in the face of these deficiencies in the Companies'**  
6 **proposals?**

7 A. I will work with Joint Intervenors to use the discovery process established in this  
8 Supplemental Proceeding to obtain from the Companies the competent and credible data  
9 and analysis necessary to calculate net metering compensation rates consistent with the  
10 Commission NMS Methodology.

11 **Q. Do you recommend any further action by the Commission?**

12 A. Yes. The Commission should specifically order the Companies to produce competent and  
13 credible data and analysis to support application of the Commission NMS Methodology  
14 to the task of determining fair, just, and reasonable compensation rates for customers, and  
15 to account for any gaps in necessary data or analysis.

16 **THE COMMISSION SHOULD REFERENCE THE HAYIBO AND PEARCE VALUE OF**  
17 **SOLAR META-ANALYSIS FOR DATA THAT THE COMPANIES FAIL TO PROVIDE**  
18 **OR WHERE UTILITY DATA IS INADEQUATE OR UNRELIABLE**

19 **Q. Do you have any concern that data necessary to support fair, just, and reasonable**  
20 **avoided costs and incremental benefits cannot or will not be produced by the**  
21 **Companies?**

22 A. Yes. The record in this proceeding reveals that the Companies have fixed their attention  
23 on their proposed methodology and the data that supports their preferred outcome.<sup>7</sup> The

---

<sup>7</sup> Companies' response to AG-KIUC-172.

1 Companies have refused to acknowledge the propriety of avoided carbon costs, for  
2 example, and provided no substantive responses to Joint Intervenor’s requests for  
3 evaluations of a full range of avoided costs.<sup>8</sup> Nor have the Companies performed  
4 supporting analyses that would inform avoided costs assessments, such as system-wide  
5 hosting capacity analyses<sup>9</sup> or marginal cost of service studies.<sup>10</sup> Therefore, I am  
6 concerned that the Companies do not possess the necessary data or even a view on the  
7 proper calculation methods to support a fair, just, and reasonable export compensation  
8 rate.

9 **Q. What impact should the Companies’ lack of data and failure to develop a fair and**  
10 **reasonable export methodology have on net metering customers?**

11 A. The failure by the Companies to assess and quantify avoided costs should not penalize  
12 net metering customers. Net metering customers are entitled to fair, just, and reasonable  
13 compensation for energy exports. For this reason, I first proposed that the Commission  
14 order that full retail net metering remain in place until a fair compensation rate could be  
15 calculated. Given the Commission’s detailed and well-reasoned approach taken in the  
16 Commission NMS Methodology, I am now also comfortable with that method being used  
17 to set the compensation rate. However, I remain concerned about the lack of competent  
18 and credible data specific to the Companies.

19 **Q. What should the Commission do if the Company cannot or will not produce the**  
20 **data necessary to use the Commission NMS Methodology in setting a just and**  
21 **reasonable export compensation rate?**

---

<sup>8</sup> Companies’ responses to MA-KFTC-KSES-20, -21, -22.

<sup>9</sup> Companies’ response to MA-KFTC-KSES-26.

<sup>10</sup> Companies’ response to MA-KFTC-KSES-27.

1 A. The Commission should put in place a back-up for methods and data so that failure by the  
2 Companies does not unjustly and unfairly harm net metering customers.

3 **Q. What back-up for values and methods do you recommend?**

4 A. I am impressed by the comprehensive and well-documented meta-analysis, including  
5 sensitivity analyses reported in the Hayibo and Pearce review of value of solar studies. I  
6 recommend that the Commission adopt the values and methods in that review where it  
7 cannot confidently move forward with data specific to the Companies. In addition, Joint  
8 Intervenors will take advantage of the discovery process that the Commission established  
9 in this Supplemental Proceeding to obtain input values from the Companies in order to  
10 perform the calculations set out in the Hayibo and Pearce review.

11 **THE COMMISSION SHOULD AIM TO PRODUCE A METHODOLOGY FOR**  
12 **DETERMINING NET METERING COMPENSATION RATES WHICH IS**  
13 **TRANSPARENT, CLEAR, AND ACCESSIBLE TO ALL STAKEHOLDERS**

14

15 **Q. Based on your experience developing VOS tariffs and participating in VOS dockets**  
16 **throughout the United States, do you have any recommendations regarding the**  
17 **format and structure of the Commission NMS Methodology?**

18 A. Yes. The Commission should always work towards transparency and clarity in the NMS  
19 Methodology. The Minnesota VOS Methodology provides a valuable example of how a  
20 standardized methodology can be created to be used by multiple utilities, using a  
21 transparent process whose methods, data inputs, and results are designed to be clear and  
22 understandable to stakeholders and regulators. The Minnesota Methodology provides a  
23 systematic presentation of how the method is implemented and the data inputs that are  
24 required. For example, it identifies which inputs are fixed across all utilities and which

1 are utility specific.<sup>11</sup> I urge the Commission to aspire to a similar goal for Kentucky, to  
2 reduce the burden on all parties in future utility rate cases, and to make the Methodology  
3 clear and understandable for all interested stakeholders.

#### 4 **RECOMMENDATIONS**

##### 5 **Q. Please summarize your recommendations.**

6 A. My recommendations are in three parts:

- 7 • The Commission should follow the same approach and adopt the same methodology  
8 (“Commission NMS Methodology”) for setting the NMS-2 compensation rate as it  
9 used in its order entered on May 14, 2021, in the Kentucky Power Company (“KPC”)  
10 case. However, additional avoided cost components should be included within the  
11 methodology to produce an even more comprehensive, fair, just, and reasonable  
12 compensation rate.
- 13 • The Commission should order the Companies to produce adequate and reliable data  
14 to enable application of the Commission NMS Methodology and the development of  
15 a just and reasonable compensation rate for exports.
- 16 • The Commission should reference the methods and values set out in the meta-analysis  
17 of value of solar studies authored by Hayibo and Pearce cited by the Commission in  
18 its May 14 Order in the KPC case as the source for any credible and reliable data that  
19 the Companies fail to provide.
- 20 • The Commission should aim to produce a methodology for determining net metering  
21 compensation rates which is transparent, clear, and accessible to all stakeholders.

##### 22 **Q. Does that conclude your testimony?**

---

<sup>11</sup> Minnesota Department of Commerce, *ibid*, pp.7-10.

1 A. Yes.