

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

<b>In the Matter of:</b>	)	
	)	
<b>ELECTRONIC APPLICATION OF</b>	)	
<b>DUKE ENERGY KENTUCKY, INC. FOR</b>	)	
<b>(1) AN ADJUSTMENT OF ELECTRIC</b>	)	<b>CASE NO. 2022-00372</b>
<b>RATES; (2) APPROVAL OF NEW</b>	)	
<b>TARIFFS; (3) APPROVAL OF</b>	)	
<b>ACCOUNTING PRACTICES TO</b>	)	
<b>ESTABLISH REGULATORY ASSETS</b>	)	
<b>AND LIABILITIES; AND (4) ALL</b>	)	
<b>OTHER REQUIRED APPROVALS AND</b>	)	
<b>RELIEF</b>	)	

**SIERRA CLUB’S RESPONSES TO FIRST SET OF REQUESTS FOR INFORMATION  
OF DUKE ENERGY KENTUCKY, INC.**

Sierra Club submits these responses to Duke Energy Kentucky’s First Set of Requests for Information (“RFI”).

Dated: April 7, 2023

Respectfully submitted,

*Of counsel*  
(not licensed in Kentucky)

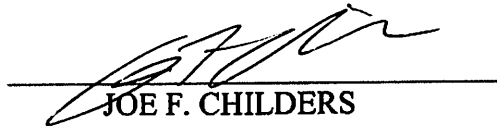
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## CERTIFICATE OF SERVICE

This is to certify that the foregoing copy of Sierra Club's First Request for Information in this action is being electronically transmitted to the Commission on April 7, 2023; and that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding.



JOE F. CHILDERS

**COMMONWEATH OF KENTUCKY**  
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**CASE NO. 2022-00372**

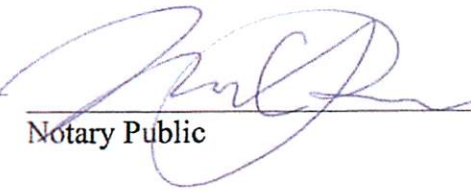
**AFFIDAVIT OF SARAH SHENSTONE-HARRIS**

Commonwealth of )  
Massachusetts )

Affiant Sarah Shenstone-Harris, being duly sworn, states that she has personal knowledge of the matters set forth in the following responses to Duke Energy Kentucky’s First Requests for Information, and that the answers contained therein are true and correct to the best of her knowledge, information, and belief.

  
\_\_\_\_\_  
Sarah Shenstone-Harris

Subscribed and sworn before me on this 7 day of April, 2023.

  
\_\_\_\_\_  
Notary Public



**Duke Energy Kentucky**  
**Case No. 2022-00372**  
**Sierra Club Response to**  
**Duke Energy Kentucky First Set Data Requests**

**Request:**

1. Other than Ms. Shenstone-Harris, please identify any persons, including experts, whom Sierra Club has consulted or retained with regard to evaluating Duke Energy Kentucky's Application in this proceeding.

**Response:**

The following individuals helped evaluate the application in this proceeding: Devi Glick (Synapse Energy Economics), Melissa Whited (Synapse Energy Economics), Selma Sharaf (Synapse Energy Economics), and Jack Smith (Synapse Energy Economics).

**Duke Energy Kentucky**  
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**Request:**

2. For each person identified in response to Interrogatory No. 1 above, please state:
  - a. the subject matter of the discussions/consultations/evaluations;
  - b. the written opinions of such persons regarding Duke Energy Kentucky's Application;
  - c. the facts to which each person relied upon; and
  - d. a summary of the person's qualifications to render such discussions/consultations/evaluations.

**Response:**

- a. Devi Glick: power plant economics, resource planning  
Melissa Whited: rate design, electric vehicles  
Selma Sharaf: power plant economic analyses  
Jack Smith: coal plant regulation, wholesale markets
- b. None of the people identified in response to Interrogatory No. 1 have developed written opinions regarding Duke Energy Kentucky's Application.
- c. Sierra Club objects as Ms. Shenstone-Harris's testimony speaks for itself. Subject to and without waiving said objection, all facts relied upon are referenced directly in Ms. Shenstone-Harris's direct testimony.
- d. Please see 01-02 Attachment for each person's resume.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

3. For each person identified in response to Interrogatory No. 1 above, please identify all proceedings in all jurisdictions in which the witness/person has offered evidence, including but not limited to, pre-filed testimony, sworn statements, and live testimony or analysis. For each response, please provide the following:
  - a. The jurisdiction in which the testimony, statement, or analysis was pre-filed, offered, given, or admitted into the record;
  - b. the administrative agency and/or court in which the testimony, statement, or analysis was pre-filed, offered, admitted, or given;
  - c. the date(s) the testimony, statement, or analysis was pre-filed, offered, admitted, or given;
  - d. the identifying number for the case or proceeding in which the testimony, statement, or analysis was pre-filed, offered, admitted, or given; and
  - e. whether the person was cross-examined.

**Response:**

- a-d. Please see 01-02 Attachment for each person's resume.
- e. Objection. This request is overly burdensome and not relevant. Only Ms. Shenstone-Harris is being offered as a witness and expert in this proceeding.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Duke Energy Kentucky First Set Data Requests**

**Request:**

4. Identify and provide all documents or other evidence that Sierra Club may seek to introduce as exhibits or for purposes of witness examination in the above-captioned matter.

**Response:**

Sierra Club objects to the extent that the request seeks documents that constitute attorney work product, or which are protected by attorney/client privilege, and to the extent they seek the disclosure of Sierra Club's mental impressions, conclusions, opinions or legal theories of its attorneys concerning this proceeding and Sierra Club's cross-examination strategy. Without waiving said objection, besides Witness Shenstone-Harris' pre-filed testimony, at this time Sierra Club has not identified any documents that might be introduced at the hearing.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
**Sierra Club Response to**  
**Duke Energy Kentucky First Set Data Requests**

**Request:**

5. Please identify all proceedings in all jurisdictions in the last three years in which Ms. Shenstone-Harris has offered evidence, including but not limited to, pre-filed testimony, sworn statements, and live testimony or analysis. For each response, please provide the following:
- a. the jurisdiction in which the testimony, statement, or analysis was pre-filed, offered, given, or admitted into the record;
  - b. the administrative agency and/or court in which the testimony, statement, or analysis was pre-filed, offered, admitted, or given;
  - c. the date(s) the testimony, statement, or analysis was pre-filed, offered, admitted, or given;
  - d. the identifying number for the case or proceeding in which the testimony, statement, or analysis was pre-filed, offered, admitted, or given;
  - e. whether the witness was cross-examined;
  - f. the custodian of the transcripts and pre-filed testimony, statements, or analysis for each proceeding; and
  - g. copies of all such testimony, statements, or analysis.

**Response:**

- a. The State of Missouri.
- b. Public Service Commission of the State of Missouri.
- c. Testimony was pre-filed on January 18, 2023, and submitted into evidence on February 7, 2023.
- d. File No. EA 2022-0245.
- e. The witness was not cross-examined.
- f. Public Service Commission of the State of Missouri.
- g. Provided in 01-05 Attachment.



**Duke Energy Kentucky**  
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**Request:**

6. Please provide copies of any and all documents, analysis, summaries, white papers, work papers, spreadsheets (electronic versions with cells intact), including drafts thereof, as well as any underlying supporting materials created by Ms. Shenstone-Harris as part of her evaluation of Duke Energy Kentucky's Application or used in the creation of Ms. Shenstone-Harris's testimony.

**Response:**

Sierra Club objects to the extent that the request seeks documents that constitute attorney work product, or which are protected by attorney/client privilege, and to the extent they seek the disclosure of Sierra Club's mental impressions, conclusions, opinions or legal theories of its attorneys concerning this proceeding. Subject to and without waiving said objection, please see the pre-filed Direct Testimony of Sarah Shenstone-Harris, the accompanying exhibits, and citations included in those documents. Also see the following workpapers, provided via secure file-share link:

01-06 Attachment A - CONFIDENTIAL: East Bend Economic Analysis

01-06 Attachment B: Load Curve Assumptions

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

7. Please provide copies of any and all documents not created by Ms. Shenstone-Harris, including but not limited to, analysis, articles, books, summaries, cases, reports, and evaluations, that Ms. Shenstone-Harris relied upon, referred to, or used in the development of her testimony.

**Response:**

Sierra Club objects as Ms. Shenstone-Harris's Testimony speaks for itself. Subject to and without waiving said objection, please see footnotes and references included in Ms. Shenstone-Harris's Direct Testimony.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

8. Please provide any and all studies, analysis, and presentations that Ms. Shenstone-Harris has created or publicly made within the last three years that involve utility regulation, ratemaking, depreciation, securitization, fossil-fueled electric generation retirements, electric vehicle (EV) incentives, or use of riders that are discussed in Ms. Shenstone-Harris's testimony.

**Response:**

Sierra Club objects to this request as irrelevant and not reasonably calculated to lead to the discovery of admissible evidence, because other utilities' decisions and practices are not at issue in this proceeding. Sierra Club also objects to this request as overbroad and unduly burdensome to the extent it requests documents, including but not limited to work for prior employers, that are not in the possession or control of Sierra Club or Ms. Shenstone-Harris, and information already available to Duke, as Ms. Shenstone-Harris has already provided her CV. Subject to and without waiving said objection, please see Response to 5(g) and 01-08 Attachment (*'Maximizing the Benefits of Transportation Electrification in Pennsylvania: The Role of Rate Design*, February 2023, Synapse Energy Economics for Pennsylvania Department of Environmental Protection'). Ms. Shenstone-Harris was previously employed at Reading Municipal Light Department, where she conducted short- and long-term power supply planning, supported the rate increase process, and led the design of new rate structures, such as a residential electric vehicle time-of-use rate. She was also involved in the administration and development of numerous energy efficiency and electrification programs, including an electric vehicle charger incentive program. Please see Ms. Shenstone-Harris's resume for more details (Exhibit SSH-1).

**Duke Energy Kentucky**  
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**Request:**

9. Please state whether there are any agreements between Sierra Club and any Intervening Party to the above-captioned proceeding, or any member or affiliate of an Intervening Party to the proceeding, that concern said proceeding. For purposes of this Interrogatory, “intervening party” includes any party to have filed a motion to intervene in the above-captioned proceeding. To the extent that Sierra Club contends that any such documents are privileged, please provide a privilege log for the same.

**Response:**

Sierra Club objects to this request as it calls for disclosure of its trade secrets and/or confidential and proprietary commercial and financial information. Sierra Club also objects to this request as it impinges on Sierra Club’s and possibly others’ First Amendment rights and privileges. Subject to and without waiving the foregoing objections, Sierra Club states that it does not have any agreements with any Intervening Party or any member or affiliate of any Intervening Party concerning this proceeding.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

10. Please state whether there are any agreements between the Sierra Club and any entity exhibiting interest in the above-captioned proceeding, or any member or affiliate of an entity exhibiting interest to the proceeding, that concern said proceeding. For purposes of this Interrogatory, “entity exhibiting interest” includes any party that has not filed a motion to intervene in the above-captioned proceeding. To the extent that the Sierra Club contends that any such documents are privileged, please provide a privilege log for the same.

**Response:**

Sierra Club objects to this request as it seeks information that is not relevant to and outside the scope of this proceeding and is not “reasonably calculated to lead to the discovery of admissible evidence,” Kentucky Civil Rule 26.02(1). Sierra Club objects to this request as it calls for disclosure of its trade secrets and/or confidential and proprietary commercial and financial information. Sierra Club also objects to this request as it impinges on Sierra Club’s and possibly others’ First Amendment rights and privileges. Subject to and without waiving the foregoing objections, Sierra Club states that it does not have any other agreements with any entity exhibiting interest in this proceeding concerning this proceeding.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Duke Energy Kentucky First Set Data Requests**

**Request:**

11. Please provide the law or regulation that requires Duke Energy Kentucky, in this case, to perform updated modeling of its 2021 IRP related to the retirement date of the East Bend.

**Response:**

KRS 278.030(1) requires that a utility’s proposed rates be “fair, just, and reasonable”—a matter determined by the Commission in reviewing a rate application. *In the Matter of: Electronic Application of Duke Energy Kentucky, Inc. for: (1) An Adjustment of the Natural Gas Rates; (2) Approval of New Tariffs, and (3) All Other Required Approvals, Waivers, and Relief*, Case No. 2021-00190, Order of Dec. 28, 2021 at 2. As the Commission explained in a recent Duke Energy Kentucky case regarding gas operations:

[T]he Commission cannot defer to the parties as to what constitutes fair, just, and reasonable rates. The Commission must review the record in its entirety . . . and apply its expertise to make an independent decision regarding the amount and categories of rates . . . that should be approved.

*Id.* Ms. Shenstone-Harris not an attorney or legal expert. The following is simply her non-legal opinion. It is Ms. Shenstone-Harris’s expert opinion that, to determine whether Duke Energy Kentucky’s proposed rates are “fair, just, and reasonable,” updated modeling is required, including for questions relating to East Bend’s retirement. The Commission’s review of the record and application of its expertise requires access to a complete record as to relevant, up-to-date information—such as modeling related to the retirement of East Bend.

**Duke Energy Kentucky**  
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**Request:**

12. Referencing Footnote 20 of Ms. Shenstone-Harris's Direct Testimony, please provide detailed calculations for East Bend's utilization rates from 2018 to 2022, as shown in Figure 1 on page 17 of Ms. Shenstone-Harris's Direct Testimony.

**Response:**

Please see tab "Historical Capacity Factors" in 01-06 Attachment A - CONFIDENTIAL.

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**Request:**

13. Referencing Figure 1 on page 17 of Ms. Shenstone-Harris's Direct Testimony, please provide the reference to the specific Duke Energy Kentucky data used to create this figure and provide the underlying source data.

**Response:**

Please see page 19, lines 3-12 for a description of the data used. Source data for the figure is provided in 01-06 Attachment A - CONFIDENTIAL.



**Duke Energy Kentucky**  
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**Request:**

14. Referencing page 19 of Ms. Shenstone-Harris's Direct Testimony, please describe, and provide accompanying calculations, as applicable, how Ms. Shenstone-Harris "estimated East Bend's historical capacity value based on its unforced capacity (UCAP) and the capacity value in PJM's Base Residual Auction (BRA) for each planning year."

**Response:**

Please see 01-06 Attachment A - CONFIDENTIAL.

**Duke Energy Kentucky**  
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**Request:**

15. Please provide all documents and reports relied on to support Ms. Shenstone-Harris's statement on page 42 of her Direct Testimony that "[f]or wind and solar, O&M and sustaining capital costs are relatively low."

**Response:**

The variable and fixed O&M costs are lower for solar PV and onshore wind than they are for coal power plants. See U.S. Energy Information Administration, "Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2022," March 2022, available at: [https://www.eia.gov/outlooks/aeo/assumptions/pdf/table\\_8.2.pdf](https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf) and National Renewable Energy Laboratory, "Annual Technology Baseline: 2022 Electricity ATB Technologies and Data Overview: Summary of Minimum and Maximum Values of CAPEX, Capacity Factor, O&M and LCOE," 2022, available at: <https://atb.nrel.gov/electricity/2022/index>.

**Duke Energy Kentucky**  
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**Request:**

16. Referencing Ms. Shenstone-Harris's Direct Testimony at page 51, please provide a citation to any legislation that is currently pending in Kentucky related to securitization and the status of that legislation.

**Response:**

An Act Relating to Investor-Owned Utilities, S.B. 192 (introduced February 21, 2023, signed by the Kentucky Governor March 23, 2023), *available at:* <https://apps.legislature.ky.gov/record/23rs/sb192.html>. Since Ms. Shenstone-Harris submitted her testimony, S.B. 192 was signed into law by Governor Beshear

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**Request:**

17. Referencing Ms. Shenstone-Harris's statement on page 57 of her Direct Testimony that she has "reviewed EV [time-of-use] tariffs and enrollment levels in multiple other jurisdictions," please provide the names of the utilities, their relevant tariffs, and the monthly savings achieved by relevant customers for all such tariffs that Ms. Shenstone-Harris has reviewed.

**Response:**

Ms. Shenstone-Harris reviewed rates and enrollment levels from the four largest investor-owned utilities in Pennsylvania (PECO, Duquesne Light Company (Duquesne), PPL Electric Utilities (PPL), and Metropolitan Edison Company (Met-Ed)). For PECO, Ms. Shenstone-Harris reviewed Residential Service and the Time-Of-Use (TOU) Pricing Option. For Duquesne, Ms. Shenstone-Harris reviewed the Electric Vehicle Time-of-Use (EV-TOU) Pilot and Residential Service. For PPL, Ms. Shenstone-Harris reviewed Residential Service and Residential Service – Time of Day. For Med-Ed, Ms. Shenstone-Harris reviewed Residential Service Rate and Rider K (Time-of-Use Default Service Rider). Monthly savings are available in 01-08 Attachment. As discussed on page 57 of Ms. Shenstone-Harris's direct testimony, she also reviewed Baltimore Gas and Electric Company's Residential Electric Vehicle Time-of-Use Electric Schedule, which had savings of \$10.50 per month if charging occurs off-peak, based on a monthly EV consumption of 300 kWh. Ms. Shenstone-Harris also reviewed San Diego Gas & Electric (SDG&E)'s EV-TOU-2, EV-TOU-5, and Domestic Rate Schedule. Using November 2021 data, off-peak charging on EV-TOU-2 and EV-TOU-5 saved \$0.14/kWh and \$0.35/kWh, respectively, relative to the domestic rate.

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**Request:**

18. Please provide the communication referenced on page 57, footnote 106 of Ms. Shenstone-Harris's Direct Testimony.

**Response:**

Please see 01-18 Attachment.

**Duke Energy Kentucky**  
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**Request:**

19. Is it Ms. Shenstone-Harris's contention that time-of-use (TOU) rates are the only way to manage EV charging load?

**Response:**

No.

**Duke Energy Kentucky  
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Duke Energy Kentucky First Set Data Requests**

**Request:**

20. Is Ms. Shenstone-Harris familiar with the DSM programs that manage EV charging load?

**Response:**

Yes.

**Duke Energy Kentucky**  
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**Request:**

21. What is the comparative \$/kW rate for Duquesne Light Company's standard residential rates? Please provide supporting documentation for Duquesne Light Company's standard residential rates.

**Response:**

Ms. Shenstone-Harris did not conduct analysis to determine the \$/kW rate for Duquesne Light Company's standard residential rates. Duquesne Light Company's rates are available at: <https://www.duquesnelight.com/docs/default-source/default-document-library/currenttariff.pdf?v=58>.



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**Request:**

22. What is the comparative \$/kW rate for Duquesne Light Company's EV rates? Please provide supporting documentation for Duquesne Light Company's EV rates.

**Response:**

Ms. Shenstone-Harris did not conduct analysis to determine the \$/kW rate for Duquesne Light Company's EV rates. Duquesne Light Company's rates are available at:  
<https://www.duquesnelight.com/docs/default-source/default-document-library/currenttariff.pdf?v=58>.

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**Request:**

23. What is the comparative \$/kW rate for Baltimore Gas and Electric Company's standard residential rates? Please provide supporting documentation for Baltimore Gas and Electric Company's standard residential rates.

**Response:**

Ms. Shenstone-Harris did not conduct analysis to determine the \$/kW rate for Baltimore Gas and Electric Company's standard residential rates. Baltimore Gas and Electric Company's rates are available at:

<https://www.bge.com/MyAccount/MyBillUsage/Pages/ElectricServiceRatesTariffs.aspx>.

**Duke Energy Kentucky**  
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**Request:**

24. What is the comparative \$/kW rate for Baltimore Gas and Electric Company's EV rates? Please provide supporting documentation for Baltimore Gas and Electric Company's EV rates

**Response:**

Ms. Shenstone-Harris did not conduct analysis to determine the \$/kW rate for Baltimore Gas and Electric Company's EV rates. Baltimore Gas and Electric Company's rates are available at: <https://www.bge.com/MyAccount/MyBillUsage/Pages/ElectricServiceRatesTariffs.aspx>.

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**Request:**

25. Does Ms. Shenstone-Harris agree that distribution system costs are local in nature? If no, please explain in detail why Ms. Shenstone-Harris disagrees.

**Response:**

Sierra Club objects to this request as vague and ambiguous, including but not limited to what is meant by “local.” Subject to and without waiving this objection, Sierra Club states that distribution costs are generally more local to the customer than system-wide costs, but the specifics depend on the distribution costs in question, and how one defines “local”.

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**Request:**

26. Has Ms. Shenstone-Harris performed any peak demand analysis for EV adopters to determine how that demand impacts whole house peak demand? If so, please provide this analysis.

**Response:**

No, Ms. Shenstone-Harris has not performed this analysis.

**Duke Energy Kentucky**  
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**Request:**

27. Has Ms. Shenstone-Harris performed an analysis to determine whether DCFC and fleet customers always charge off-peak? If so, please provide this analysis.

**Response:**

No, Ms. Shenstone-Harris has not performed this analysis.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

28. Does Ms. Shenstone-Harris agree that there are no tariff provisions or physical breaker that prevents DCFC and fleet customers from charging on-peak? If no, please explain in detail why Ms. Shenstone-Harris disagrees.

**Response:**

Ms. Shenstone-Harris agrees.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

29. Does Ms. Shenstone-Harris agree that Non-Coincident kW charges have been used as a reasonable method of collecting revenues among class customers based on their maximum use of the distribution system? If no, please explain in detail why Ms. Shenstone-Harris disagrees.

**Response:**

Non-coincident kW charges have been used as a method to collect revenues, but as detailed in Ms. Shenstone-Harris's testimony at page 60, in general, non-coincident demand charges do not accurately reflect how costs are imposed on the distribution system and therefore such charges do not accurately reflect an individual customer's contribution to distribution system costs.



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**Request:**

30. Is Ms. Shenstone-Harris suggesting that most customers are peaking in off-peak hours today?

**Response:**

No.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

31. If a customer is peaking with existing load during on-peak hours, what would a non-coincident demand charge encourage that customer to do?

**Response:**

A non-coincident demand charge would encourage a customer peaking with existing load during on-peak hours to reduce demand or flatten their load, but not necessarily shift to off-peak hours.

**Duke Energy Kentucky**  
**Case No. 2022-00372**  
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**Request:**

32. Why is Ms. Shenstone-Harris's analysis related to Duke Energy Kentucky's Rate DT based only on EV load?

**Response:**

Synapse Energy Economics' scope of work for Sierra Club was focused on the rate's impact on transportation electrification.

**Duke Energy Kentucky**  
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**Request:**

33. What would be the results of Ms. Shenstone-Harris's analysis related to Duke Energy Kentucky's Rate DT assuming a customer's current load?

**Response:**

Ms. Shenstone-Harris did not conduct that analysis.

**Duke Energy Kentucky**  
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**Request:**

34. Please provide the loads from LBNL HEVI-PRO utilized in Tables 4 and 5 of the Direct Testimony of Ms. Shenstone-Harris in spreadsheet format with formulas intact.

**Response:**

Please see 01-06 Attachment B.

**Duke Energy Kentucky**  
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**Request:**

35. How many MWs of solar, wind, and batteries does Ms. Shenstone-Harris estimate are needed to adequately replace East Bend upon its retirement?
- a. What is the estimated cost per MW of such a strategy?
  - b. Does Ms. Shenstone-Harris believe all of those solar, wind, and battery resources should be located within Duke Energy Kentucky's service territory? If the response is in the negative, where will such resources be located?
  - c. What percentage of the customers' energy needs will come from market purchases assuming replacement of East Bend with 100 percent solar, wind, and battery resources?

**Response:**

Ms. Shenstone-Harris did not complete this analysis.

- a. Ms. Shenstone-Harris did not complete this analysis.
- b. Not necessarily. This depends on a range of factors that include costs, local constraints and issues, and transmission access and constraints. Ms. Shenstone-Harris did not complete such an analysis.
- c. Ms. Shenstone-Harris did not complete this analysis.

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**Request:**

36. What percentage of market energy purchases does Sierra Club believe is reasonable for Duke Energy Kentucky to serve customers' load?

**Response:**

In the opinion of Ms. Shenstone-Harris, the expert providing analysis for Sierra Club in this proceeding, a reasonable level of market energy purchases is 10-15% of the total energy required to serve customer load, on an annual or monthly basis.

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**Request:**

37. Please provide an explanation of how renewable plus storage will overcome the following challenges:
- a. Extreme weather risks over five consecutive days?
  - b. Several consecutive days of cloud cover?
  - c. Several consecutive days of light winds?
  - d. High market prices?

**Response:**

a-c:

Battery storage, wind, and solar, both paired and stand-alone can be complimentary resources as part of a broader and diverse resource portfolio. However, Ms. Shenstone-Harris makes no claims in her testimony about storage's ability to replace all fossil resources today, nor is she saying that all fossil fuel resources should be immediately replaced with renewables and current storage technologies. Current storage technologies do not offer services of being online for several consecutive days, but they do offer the ability to shift energy to on-peak periods, such as solar energy generated during the day that can be stored and discharged during the evening peak periods. In locations with high penetrations of renewables, long-duration storage and other firm clean energy resources will be needed, but Duke Kentucky is nowhere near that level of renewable penetration. The services offered by renewables and battery storage technologies available on the market today can benefit Duke's ratepayers by reducing system risks and costs. Additionally, Duke Energy Kentucky is a member of PJM; being part of an RTO can also reduce some of the potential challenges associated with current renewable and battery storage technologies. For instance, when there is a broad base of renewables over a wide swath of territory, such as PJM's territory, areas without cloud cover and/or with wind can provide energy to areas where renewable generation is limited.

d:

Sierra Club objects to this request as vague and ambiguous, including but not limited to what is meant by "high market prices." Sierra Club also objects to this request as overly broad and unduly burdensome. Subject to and without waiving said objection, Ms. Shenstone-Harris does not present testimony about renewable plus storage and its relationship with high market prices.



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**Request:**

38. Refer to Figure 1 of Ms. Shenstone-Harris's Direct Testimony. Provide this data through 2035.

**Response:**

Please see 01-06 Attachment A - CONFIDENTIAL.

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**Request:**

39. Refer to page 29 of Ms. Shenstone-Harris's Direct Testimony, lines 5-6, referencing "DEK itself admits, the scenario with a carbon price represents a far more realistic future..." (Emphasis added). Please provide support for this statement.

**Response:**

Sierra Club objects to this request as Ms. Shenstone-Harris's testimony speaks for itself. Sierra Club also objects to mischaracterizing Ms. Shenstone-Harris's testimony, including to the extent it implies Ms. Shenstone-Harris's discusses the viability of a future carbon price. Subject to, and without waiving those objections, Ms. Shenstone-Harris is referring to Duke's declining capacity factor assumptions (which is part of the carbon price modeling scenario) as a "far more realistic future," not the likeliness of a carbon price itself. As Duke Energy Kentucky expert witnesses admit in their direct testimonies, East Bend capacity factors will decline in the coming years (see Ms. Lawler (Direct Testimony, page 13), Mr. Luke (Direct Testimony, page 12), Mr. Park (Direct Testimony, page 8), and Mr. Swez (Direct Testimony, page 10)).

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**Request:**

40. Referring to page 32, line 11 of Ms. Shenstone-Harris's Direct Testimony, please provide the power prices, including all data, calculations, and analysis that supports the claims regarding East Bend's performance with "more appropriate fixed costs and capacity factor assumptions."

**Response:**

Please see 01-06 Attachment A - CONFIDENTIAL.

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**Request:**

41. If PJM enacts a seasonal capacity requirement in order to maintain reliability, how many MWs of solar, wind and batteries does Ms. Shenstone-Harris and/or Sierra Club estimate are needed to adequately displace a thermal unit to replace East Bend assuming a seasonal reserve margin of 9%.

**Response:**

Ms. Shenstone-Harris and/or Sierra Club did not complete this analysis.

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**Request:**

42. Referring generally to Ms. Shenstone-Harris's Direct Testimony, please discuss the locational Marginal Pricing (LMPs) for the period from 2028 through 2035 and the relevance of those process to the retirement decision for East Bend.

**Response:**

LMPs are relevant to the retirement decisions for East Bend because they both influence utilization levels at East Bend and they drive projections around expected energy market revenues at the Plant. First, LMPs are expected to fall as the penetration of renewables (which have a dispatch cost of zero) on the grid increases and gas prices continue to fall. East Bend is expected to be less competitive and therefore dispatched with declining frequency as lower cost energy resources become more prevalent on the grid. This will reduce its capacity factor, providing less energy market revenues to cover its operational costs and therefore making it less economic to keep online. Expected capacity factor decline as a result of the lower priced energy market, or lower LMPs, is documented in Duke Energy Kentucky's expert witness testimonies (see Mr. Luke's Direct Testimony, page 12, and Mr. Park's Direct Testimony, page 9). Second, LMPs impact East Bend's energy revenues. If Duke Energy Kentucky is assuming that LMPs will be high in the future, it is then assuming that East Bend's revenue per MWh generated will also be high. Likewise, if LMPs are estimated to be lower in the future, then East Bend's revenue per MWh generated will also be lower. Assumptions around LMPs are an important part of Duke's modeling and the associated decisions for East Bend's retirement, both for expectations of the plant's dispatchability and future revenues. Please refer to Ms. Shenstone-Harris's direct testimony at pages 30 through 33 for a more detailed discussion of the importance of realistic LMP assumptions for Duke Energy Kentucky's modeling for East Bend.

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**Request:**

43. What statistic-backed method does Ms. Shenstone-Harris propose to use to determine residential TOU differentials?

**Response:**

Sierra Club objects to this request as vague and ambiguous, overly broad, unduly burdensome, including, but not limited to, what is meant by “statistic-backed method.” Subject to and without waiving said objection, it is Ms. Shenstone-Harris’s opinion that residential TOU differentials should be based on marginal cost of service studies.