

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

In the Matter of:

AN ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL ADJUSTMENT	)	
CLAUSE OF DUKE ENERGY KENTUCKY, INC.	)	Case No. 2023-0012
FROM NOVEMBER 1, 2020 THROUGH	)	
OCTOBER 31, 2022	)	

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**DIRECT TESTIMONY OF**

**BRAD DANIEL**

**ON BEHALF OF**

**DUKE ENERGY KENTUCKY, INC.**

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September 22, 2023

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**I. INTRODUCTION AND PURPOSE**

1 **Q. STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Brad Daniel and my business address is 525 S Tryon Street,  
3 Charlotte, North Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed as Director, Generation Dispatch and Operations, by Duke Energy  
6 Carolinas, LLC, a utility affiliate of Duke Energy Kentucky, Inc. (Duke Energy  
7 Kentucky or Company).

8 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND  
9 AND PROFESSIONAL EXPERIENCE.**

10 A. I received a Bachelor of Arts degree from the University of Oklahoma in 2000. I  
11 received a Master's in Business Administration from Wake Forest University in  
12 2011. I joined Cinergy Corporation in 2001 and have held various positions with  
13 the Company or its affiliates in the generation dispatch and operations and power  
14 trading roles. I have managed the Midwest short term trading portfolio, where I  
15 was responsible for power, natural gas, and Financial Transmission Rights (FTR)  
16 hedging portfolios covering Duke Energy Kentucky. I also have managed our  
17 Fuels and Fleet Analytics team, responsible for fuels forecasting of the Duke  
18 Energy Kentucky portfolio. I assumed my current position in December of 2019.

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**  
2 **PUBLIC SERVICE COMMISSION?**

3 A. Yes. I have previously provided testimony in support of the Company's Fuel  
4 Adjustment Clause (FAC).

5 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS DIRECTOR,**  
6 **GENERATION DISPATCH & OPERATIONS.**

7 A. I am responsible for the Company's: (i) generation dispatch; (ii) unit  
8 commitment; (iii) 24-hour real-time operations; and (iv) short-term generating  
9 maintenance planning. I am also responsible for the submission of the Company's  
10 supply offers to the PJM Interconnection, L.L.C. (PJM) regional transmission  
11 organization (RTO) day-ahead and real-time electric power markets, as well as  
12 managing the Company's short-term supply position to ensure that the Company  
13 has adequate resources committed to serve its retail customers' electricity needs.

14 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

15 A. The purpose of my testimony is to respond to Paragraph 4(f)-(j) and (k) of the  
16 Commission's September 6, 2023 Order (Order) and to more broadly discuss  
17 changes in the wholesale electric power market, the Company's efforts to mitigate  
18 high fuel and purchased power costs, as well as, its handling of outages and off-  
19 system sales and to discuss Duke Energy Kentucky's operation in the PJM LLC  
20 (PJM) market. Finally, I sponsor several of Duke Energy Kentucky's responses to  
21 the Commission's Data Requests contained in Appendix B of its Order.

**II. DISCUSSION OF DUKE ENERGY KENTUCKY'S POWER  
PROCUREMENT PRACTICES**

1 **Q. PLEASE DESCRIBE ANY CHANGES THAT OCCURRED IN THE**  
2 **WHOLESALE ELECTRIC POWER MARKET BETWEEN NOVEMBER**  
3 **1, 2020 AND OCTOBER 31, 2022 THAT SIGNIFICANTLY AFFECTED**  
4 **DUKE ENERGY KENTUCKY'S ELECTRIC POWER PROCUREMENT**  
5 **PRACTICES.**

6 A. Duke Energy Kentucky joined PJM effective January 1, 2012, and thus continued  
7 to operate within PJM during the period under review in this proceeding.  
8 Accordingly, the Company continues to offer its generation and bid its load into  
9 the PJM market. For the Duke Energy Kentucky generating capacity, the  
10 Company offered its resources in an FRR capacity plan. The generating resources  
11 that are committed in the FRR plan have a must-offer obligation for their energy  
12 in the Day-Ahead Energy Market. Duke Energy Kentucky Witness Mr. McClay  
13 discusses the PJM Capacity markets in greater detail through his direct testimony.

14 The wholesale electric power market sustained significant volatility during  
15 the review period. Markets were in a depressed power market environment with  
16 low power prices in late 2020 through early 2021 and transitioned to a  
17 significantly inflated power market by the third quarter of 2021 and most of 2022.  
18 Several market constraints impacted the wholesale power market as power market  
19 prices quickly increased during 2021. Natural gas and PJM power prices rose  
20 significantly and coal markets became distressed beginning in the summer of  
21 2021 resulting in a rapid climb in power prices across the market. This increase in  
22 power prices drove coal burns significantly higher across the energy sector. Due

1 to several factors described in the testimony of Kimberly Hughes, during the  
2 review period coal markets experienced a high degree of market volatility  
3 including the inability of coal suppliers to respond timely to changes in demand.  
4 The impacts in the coal supply chain along with sharply rising coal, natural gas  
5 and power prices led to sustained strength in energy prices throughout the period.  
6 This constrained energy market environment persisted through 2022. Also,  
7 seasonal NOx prices were also significantly inflated in 2022 as emissions markets  
8 digested changes to the Environmental Protection Agency's Good Neighbor Rule  
9 as well as corresponding strength in commodity prices driving very strong market  
10 prices and demand for coal generation during Ozone Season 2022. This being  
11 said, East Bend continued to compete favorably in the PJM market through the  
12 period, with typical dispatch of this unit at full load during on-peak hours,  
13 especially through the latter end 2021 and 2022 as coal generation was more  
14 profitable in the market. As market coal prices and thus the marginal fuel cost of  
15 the unit increased, the unit dispatched between minimum and maximum load  
16 more often in off peak hours while sustaining a high amount of dispatch at full  
17 load in on peak hours. The Company's six combustion turbines at Woodsdale  
18 station continue to see limited dispatch within the PJM energy markets.

19 Duke Energy Kentucky continued to make economic purchases from PJM  
20 when purchases were more economic than dispatching its own generation for the  
21 benefit of the Company's native load. Also, the Company continued to make  
22 economic power purchases for both planned and unplanned outages from PJM  
23 during the audit period to mitigate exposure to market prices. Said another way,

1 the Company does not commit more expensive generation to the market for the  
2 purpose of replacing generation in outage, it follows the fundamentals of  
3 economic commitment and dispatch to purchase the most economic power  
4 possible during times when a unit is in outage.

5 PJM commits and dispatches these resources via their security constrained  
6 unit commitment and least-cost economic dispatch software by modeling the  
7 Duke Energy Kentucky generating resources with all other generating resources  
8 in the PJM area. If not committed day-ahead, the units may still be called upon in  
9 real-time. There are separate LMPs calculated for Day-Ahead versus Real-Time  
10 Markets that are paid to the generators or charged to the load. PJM also operates  
11 an ancillary service market for regulation, day-ahead scheduling reserves, non-  
12 synchronized, and synchronized reserves, each of which is cleared separately with  
13 different prices for each product. In addition, PJM reimburses service providers  
14 such as Duke Energy Kentucky for blackstart and reactive services. The Duke  
15 Energy Kentucky Woodsdale gas-fired combustion turbine plant is currently a  
16 blackstart unit in the applicable Duke Energy blackstart plan and, in addition, is  
17 reimbursed for certain costs to provide blackstart service by PJM. Duke Energy  
18 Kentucky continues to operate its generating resources to optimize revenues  
19 available in the PJM capacity market and energy market and for ancillary  
20 services, blackstart, and reactive service in a reliable manner for the benefit of  
21 customers and shareholders.

1 **Q. PLEASE IDENTIFY ANY CHANGES IN THE WHOLESALE POWER**  
2 **MARKET THAT ARE EXPECTED TO OCCUR IN THE NEXT TWO**  
3 **YEARS THAT COULD SIGNIFICANTLY AFFECT DUKE ENERGY**  
4 **KENTUCKY'S POWER PROCUREMENT PRACTICES.**

5 A. From a macro level perspective, the Company believes that the energy and  
6 electricity sector continues to go through an extraordinary period of change. This  
7 change is primarily driven by shifts in load growth patterns, commodity price  
8 relationships, the move towards sustainable generation, and increasing regulatory  
9 uncertainty.

10 Although the Company believes that the PJM energy markets will  
11 continue to function as they do today, wholesale energy and capacity price  
12 volatility will likely continue. Direct drivers behind this increased volatility  
13 include the volatility of natural gas and coal prices and the impact on wholesale  
14 power prices. Other fuel related drivers include the effects of the onset of the  
15 transitioning energy mix in the wholesale power market to include more  
16 renewable and intermittent generation, impacts of retiring coal generation on  
17 traditional coal supply chains, and the ongoing relationship between domestic  
18 coal and natural gas production to export demand. Finally, the impact of evolving  
19 environmental regulations on traditional fossil fuel energy resources, and any  
20 structural market changes implemented by PJM that impact energy and capacity  
21 markets could significantly impact power procurement practices as well. As coal-  
22 fired generation continues to retire, the wholesale power market will continue to  
23 digest the impact on how grid operators will reliably meet demand.



1           The Company expects to continue to provide reliable and economic  
2 generation from its resources at East Bend and Woodsdale over the next two years  
3 and expects to continue meeting its energy needs economically through the PJM  
4 market. Duke Energy Kentucky will continue to make economic purchases from  
5 PJM when market purchases are more economic than committing or dispatching  
6 its own generation for the benefit of the Company's native load. Because  
7 marginal power prices are lower than the marginal cost to operate East Bend, the  
8 company currently models East Bend as a Must Run unit in its forward looking  
9 fuel projection model through April of 2024. If marginal market prices do realize  
10 lower than the marginal cost to operate East Bend, the unit could see more reserve  
11 shutdowns in the upcoming two-years based on economic demand for the unit.

12 **Q. PLEASE EXPLAIN A RESERVE SHUTDOWN AND IF COAL IS**  
13 **CONSUMED DURING A RESERVED SHUTDOWN.**

14 A. A reserve shutdown is utilized when a unit is offline because there is not  
15 economic demand for it. This is an event where a unit is available for load but is  
16 not synchronized due to lack of economic demand. This type of event is  
17 sometimes referred to as an economy outage or economy shutdown. Based on  
18 fundamentals of economic commitment and dispatch, if a unit is in reserve  
19 shutdown it should be more economic to purchase power from the market to meet  
20 demand than to commit and dispatch the unit into the market. Since the unit is not  
21 running during a reserve shutdown, coal is not consumed.

1 **Q. PLEASE GENERALLY DESCRIBE DUKE ENERGY KENTUCKY'S**  
2 **POWER PROCUREMENT PRACTICES.**

3 A. During the entire review period, Duke Energy Kentucky has been a member of  
4 PJM, the nation's first fully functioning RTO that operates the power grid and  
5 wholesale electric market for all or parts of thirteen states and the District of  
6 Columbia. As discussed herein and in the Direct Testimony of James McClay,  
7 this electric market consists of energy markets, capacity markets, ancillary  
8 services markets, and a FTR market. PJM's operation is governed by agreements  
9 approved by the Federal Energy Regulatory Commission (FERC) including the  
10 Operating Agreement, Open Access Transmission Tariff (OATT), and the  
11 Reliability Assurance Agreement. As a member of PJM, Duke Energy Kentucky  
12 is subject to these agreements, which among other things, require Duke Energy  
13 Kentucky to offer all of its available generation to PJM and to purchase its  
14 customer energy load from the PJM Day-Ahead or Real-Time Energy Markets.  
15 The Day-Ahead and Real-Time Energy Markets are collectively referred to as the  
16 PJM Energy Market for the remainder of my testimony.

17 Consistent with its PJM membership, during the period under review, the  
18 Company met all its energy needs through the PJM Energy Market and did not  
19 purchase any energy outside of PJM. Through PJM's Day-Ahead market, market  
20 participants can mitigate their exposure to real-time price risk by selling available  
21 generation and purchasing forecasted demand in the Day-Ahead energy market.  
22 Duke Energy Kentucky submits demand bids and supply offers as both a load  
23 serving entity and a generator owner, respectively. Thus, the Company

1 simultaneously functions as both a buyer and seller to serve its retail electric  
2 customers.

3 During the review period, Duke Energy Kentucky also participated in  
4 PJM's Ancillary Services Markets. Day-Ahead and Real-Time prices for ancillary  
5 services appear to be at reasonable price levels consistent with market conditions.  
6 Furthermore, Duke Energy Kentucky's generating units are appropriately  
7 receiving day-ahead and real-time awards for supply of reserves.

8 **Q. PLEASE DESCRIBE ANY ACTIONS TAKEN BY DUKE ENERGY**  
9 **KENTUCKY TO MITIGATE HIGH FUEL OR PURCHASED POWER**  
10 **COSTS FOR CUSTOMERS THROUGH ITS POWER PROCUREMENT**  
11 **PRACTICES.**

12 A. Duke Energy Kentucky takes several actions in the normal course of business to  
13 mitigate high fuel cost or purchase power for customers. Throughout the period  
14 the Company maintained up to date and accurate supply offers of its available  
15 generation to continue to maximize its generating units' margin and minimize  
16 customer costs. As discussed in the testimony of Ms. Hughes, the Company  
17 continues to maintain a comprehensive coal procurement strategy that has proven  
18 successful over the years in limiting average annual fuel price changes while  
19 actively managing the dynamic demands of its fossil fuel generation in a reliable  
20 and cost-effective manner. The coal procurement strategy discussed in her  
21 testimony is designed to mitigate high fuel costs to Duke Energy Kentucky  
22 customers. The Company employed a Must Run status at its East Bend unit  
23 throughout the period in review in response to rising power prices that sustained

1 from the third quarter of 2021 through 2022. Committing the unit as Must Run  
2 when the unit is available maximizes portfolio stability, mitigates customer risk  
3 against power and natural gas price volatility and mitigates purchased power costs  
4 with available generation when the marginal cost of the unit is lower than the  
5 market price. When a unit is committed with a Must Run status, it is still able to  
6 dispatch between min and max load, enabling the company to maintain economic  
7 dispatch of the unit. This enables the Company to dispatch the unit down between  
8 max and min load when LMP is below the incremental cost of the unit, which  
9 mitigates higher fuel cost for customers while the unit is committed online but  
10 dispatched down by making market purchases that are more economic than  
11 dispatching its own generation in certain hours.

12 Furthermore, the Company staffs and offers its combustion turbine units at  
13 Woodsdale to ensure they are available for commitment and dispatch. The  
14 Company maintains up to date and accurate offers for Woodsdale units, which are  
15 dual fuel units that can generate on natural gas or fuel oil. As discussed in the  
16 direct testimony of Mr. McClay, with respect to natural gas, the company  
17 maintains supplier agreements to ensure natural gas can be procured at a  
18 competitive market price to meet the needs of the Company's gas generation fleet.  
19 The Company's natural gas supply agreements enable the Company to procure  
20 the needed volume of natural gas at the most competitive price each day.  
21 Maintaining these agreements as discussed by Mr. McClay helps mitigate higher  
22 fuel costs to the customer based on the ability to procure natural gas at  
23 competitive prices. The Company offers its Woodsdale units with a status of

1 Economic, mainly due to the higher marginal cost to operate the unit compared to  
2 market prices. During constrained periods such as high demand periods or times  
3 when natural gas deliverability or availability is constrained, the Company will  
4 staff its units for more extended periods than normal staffing and even around the  
5 clock when warranted to maximize unit availability and generating unit margin  
6 and to mitigate purchased power costs. The Company also takes advantage of its  
7 fuel diversity at Woodsdale station, which, as mentioned, can operate on natural  
8 gas or fuel oil. Especially during times when natural gas deliverability or  
9 availability is constrained, the Company mitigates purchase power risk by  
10 offering Woodsdale units on fuel oil. When market prices rise above the marginal  
11 cost of the unit on fuel oil and the unit is unavailable on natural gas, the Company  
12 is able to offer the unit on fuel oil and can be committed and dispatched on fuel  
13 oil by PJM.

14 Company station and dispatch personnel collaborate regularly to maintain  
15 up to date maintenance on its generating units, through its scheduled planned  
16 outages and proactively addressed maintenance outages, which are undertaken in  
17 order to proactively address maintenance needs at a generating unit to avoid  
18 longer term performance issues and potentially forced outages. Reducing forced  
19 outages at its generating units mitigates purchase power costs and is an important  
20 element to company personnel in operating an effective portfolio. Station and  
21 dispatch personnel work together to identify prudent market opportunities to  
22 address maintenance, such as over weekends and in off peak hours, when power

1 prices are lower which helps mitigate purchased power risk for customers and  
2 also helps maintain longer term reliability of the generating units.

3 Through the Company's back-up supply plan, the Company was able to  
4 enter into financial hedges to mitigate customer risk to day-ahead and real-time  
5 power prices during scheduled outages, which include planned outages and  
6 maintenance outages. The Company's back-up supply plan expired during the  
7 review period on June 1, 2022.

8 Duke Energy Kentucky personnel employs software models to assist with  
9 its demand forecasting to create demand bids accurately to reduce costs for  
10 customers. If the company were to habitually buy more load from PJM than it  
11 needs for its customers it would be paying more for load than necessary. If the  
12 company were to habitually buy less load from PJM than it needs for its  
13 customers it would be exposing customers to real time purchase power risk. The  
14 Company employs a forecasting review monthly to address any forecasting error  
15 trends that may be impactful to the customer in order to consistently submit  
16 demand bids as accurate as possible to PJM on behalf of its customers.

17 Finally, company personnel maintain daily reviews of supply offers for  
18 accuracy and conduct monthly PJM settlement statement reviews to identify any  
19 potential issues that may impact billing to customers.

1 **Q. DURING THE REVIEW PERIOD, WERE THERE ANY PLANNED**  
2 **OUTAGES THAT EXTENDED BEYOND THE ESTIMATED TIME OF**  
3 **THE OUTAGE? IF YES, PLEASE EXPLAIN HOW THE COMPANY**  
4 **ADDRESSED THE EXTENDED OUTAGE AND ANY RESULTING**  
5 **ENERGY OR CAPACITY SHORTFALLS.**

6 A. There were two planned outages during the review period that resulted in Planned  
7 Outage Extensions. The first planned outage extension occurred from May 3,  
8 2021 through May 10, 2021, which was an extension of the 2021 planned spring  
9 outage originally scheduled from April 24, 2021 through May 3, 2021. The  
10 outage extension addressed fan shaft and bearing repairs that carried past the  
11 planned spring outage timeframe. The Company did not experience any capacity  
12 shortfall since the unit was in a planned outage and subsequent planned outage  
13 extension. During the outage extension, Duke Energy Kentucky met all its energy  
14 needs economically through the PJM Energy Market and did not purchase any  
15 energy outside of PJM. The Company also entered into daily and weekly financial  
16 hedges to mitigate purchased power risk for customers during the time of the  
17 extension.

18 The second planned outage extension occurred from November 21, 2021  
19 through December 19, 2021, which was an extension of the 2021 planned fall  
20 outage originally scheduled from September 11, 2021 through November 21,  
21 2021. The primary drivers for the outage delays were mainly related to COVID  
22 impact on labor resources and the quality of the vendor work performed which  
23 impacted the critical path of the original outage, which included the rewind of the

1 units Generator and replacement of the Low Pressure Turbine L minus 2 (L-2)  
2 blades and resulted in the planned outage extension. The Company did not  
3 experience any capacity shortfall since the unit was in a planned outage and  
4 subsequent planned outage extension. During the outage extension, Duke Energy  
5 Kentucky met all its energy needs economically through the PJM Energy Market  
6 and did not purchase any energy outside of PJM. The Company also entered into  
7 daily, weekly and monthly financial hedges to mitigate purchased power risk for  
8 customers during the time of the extension.

9 **Q. DID DUKE ENERGY KENTUCKY ENGAGE IN ANY OFF-SYSTEM**  
10 **SALES OR INTER-SYSTEM SALES TO OFFSET HIGH FUEL OR**  
11 **POWER COSTS DURING THE REVIEW PERIOD? PLEASE EXPLAIN.**

12 A. Duke Energy Kentucky did not engage in any off-system or inter-system sales  
13 during the review period. The Company does make non-native sales to PJM when  
14 the amount of generation online and being dispatched by PJM is higher than the  
15 concurrent Duke Energy Kentucky load. These sales flow through the Company's  
16 PSM filing and 90% of sales margins are credited back to the customer, which  
17 would go toward offsetting high fuel or power costs during the review period.

18 **Q. PLEASE BRIEFLY DESCRIBE THE PJM ENERGY MARKET.**

19 A. PJM administers its Energy Market utilizing locational marginal pricing (LMP).  
20 LMP can be broadly defined as the value of one additional megawatt of energy at  
21 a specific point on the electric grid. In PJM, LMP is composed of three  
22 components; the system energy price, the transmission marginal congestion price,  
23 and the marginal loss price. Both the Day-Ahead and Real-Time Energy Markets



1 are based on supply offers and demand bids submitted to PJM by market  
2 participants, including both generator owners (as sellers) and load serving entities  
3 (as buyers).

4 The Day-Ahead Energy Market provides a means for market participants  
5 to mitigate their exposure to price risk in the Real-Time Energy Market. The Day-  
6 Ahead Energy Market also provides meaningful information to PJM regarding  
7 expected real-time operating conditions for the next day, which enhances PJM's  
8 ability to ensure reliable operation of the transmission system. The Real-Time  
9 Energy Market functions as a balancing market between generation and load in  
10 real-time. Through the PJM Energy Market and the LMP price signals, PJM  
11 provides a market-based solution to value and thus manage energy production,  
12 transmission congestion, and marginal losses in the PJM region. PJM also  
13 operates, and Duke Energy Kentucky participates in, the Ancillary Services  
14 Market. Ancillary services include:

- 15 • Synchronized Reserves, which provide energy during an unexpected  
16 period of need;
- 17 • Non-Synchronized Reserves, which also provide energy during an  
18 unexpected period of need, but which are typically off-line;
- 19 • Regulating Reserves, which are utilized to manage short-term changes  
20 in energy requirements;
- 21 • Day-Ahead Scheduling Reserves, a 30-minute day-ahead reserve  
22 product;

- 1                   • Black Start Service, which provides energy to the grid in the event of a
- 2                   black out condition; and
- 3                   • Reactive Supply and Voltage Control, which is produced by capacitors
- 4                   and generators and absorbed by reactors and other inductive devices.

5 PJM Ancillary Services Markets are co-optimized with the PJM Energy Market in  
6 order to minimize overall production costs across the PJM footprint.

7                   In addition to these more physical Energy and Ancillary Services Markets,  
8 PJM offers financial products that can be utilized to hedge exposure to the Energy  
9 Markets. Virtual transactions can hedge risk in the Real-Time Energy Market, and  
10 FTR transactions can hedge exposure to day-ahead congestion costs. FTR  
11 auctions are conducted annually, quarterly, and monthly. FTRs are defined with  
12 source and sink points that entitle and obligate the holder to a stream of revenues  
13 or charges based on the hourly day-ahead congestion price differences across the  
14 defined path. Duke Energy Kentucky utilizes FTRs to manage the congestion risk  
15 from its generation stations to its load zone. Virtual transactions clear in the Day-  
16 Ahead Energy Market as virtual generators and loads at specific points on the  
17 grid. Virtual transactions settle based on the difference between the day-ahead and  
18 real-time LMP at the specific node. Duke Energy Kentucky may utilize virtual  
19 transactions to hedge generator performance risk, primarily during start up or as a  
20 potential operational contingency.

1 **Q. PLEASE EXPLAIN HOW PJM DISPATCHES GENERATING**  
2 **RESOURCES TO MEET DEMAND.**

3 A. An RTO such as PJM performs a security constrained economic commitment and  
4 least-cost security constrained economic dispatch process that simultaneously  
5 optimizes energy and reserves for all generation in its footprint in determining  
6 which assets to commit and dispatch. This process considers the various, unique  
7 challenges faced in reliably and economically supplying power to all load across  
8 its footprint, most significantly aligning the production of energy simultaneously  
9 with the volatility in demand within the capability of the transmission network.  
10 PJM must continually act to account for the fact that customer demand is dynamic  
11 in nature, fluctuating over the course of a day, week, and season, while analyzing  
12 factors such as costs and operating characteristics of generation from different  
13 types of units within its entire footprint and expected and unexpected conditions  
14 on the transmission network that affect which generation units can be used to  
15 serve load economically and reliably given the numerous constraints that must be  
16 considered. Because of these challenges, PJM's dispatch process "is designed to  
17 be an optimization process...so that a reliable supply of electricity at the lowest  
18 cost possible under the conditions prevailing in each dispatch time interval can be  
19 delivered."<sup>1</sup>

20 Importantly, PJM's decisions as to which generating units should be  
21 dispatched are not made exclusively based on the individual unit's cost. Although  
22 the price of energy at a generating unit is certainly important, PJM's dispatch

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<sup>1</sup> FERC Docket AD05-13-000, *Report on Security Constrained Economic Dispatch by the Joint Board of PJM/MISO Region*, Attachment 1, at pg. 5 (May 24, 2006).

1 process must consider a number of factors, including system-wide reliability,  
2 transmission grid congestion and losses, and numerous operational conditions.  
3 PJM has access to complete information regarding the operation of its Day-Ahead  
4 and Real-Time Energy Markets in making the determination to commit and  
5 dispatch a unit. Because of the efficient and informed nature of PJM's dispatch  
6 methodology, a utility's energy purchases in PJM's Day-Ahead and Real-Time  
7 Energy Markets are the most efficient and economic means available to satisfy  
8 customer load. Stated another way, energy acquired by all load serving entities  
9 from PJM is necessarily, and by definition, purchased on an economic dispatch  
10 basis.

11 **Q. WHAT LEVEL OF CONTROL DOES PJM HAVE OVER DISPATCH OF**  
12 **DUKE ENERGY KENTUCKY'S GENERATING UNITS?**

13 A. PJM is the grid operator for the PJM RTO and is responsible for all regional  
14 Reliability coordination as defined in the NERC and Regional Standards and  
15 applicable PJM Operating Manuals as well as commitment and dispatch of system  
16 resources via their security constrained unit commitment and least-cost economic  
17 dispatch model. The model is also used to calculate real-time Locational Marginal  
18 Prices and is created and maintained from input data received by PJM from  
19 various sources including Transmission Owners, Generation Owners, Load  
20 Serving Entities, and other Balancing Authorities. Duke Energy Kentucky  
21 generation dispatchers follow PJM generation dispatch signal instructions and  
22 relay necessary instructions to the generation stations and maintain constant

1 communication with PJM unless otherwise prevented by emergent conditions  
2 causing loss of telephonic and electronic communication with PJM directly.

3 **Q. PLEASE EXPLAIN HOW DUKE ENERGY KENTUCKY BIDS ITS**  
4 **GENERATING ASSETS INTO PJM'S ENERGY MARKETS.**

5 A. Duke Energy Kentucky offers its units to PJM's energy and ancillary service  
6 market for commitment and dispatch purposes based on variable production costs  
7 used for the calculation of incremental cost, no-load cost, and startup cost. These  
8 costs are comprised of the market price of fuel and emissions plus variable  
9 operation and maintenance costs. For purposes of clarification, "commitment"  
10 means the decision to start a generator that is offline or to maintain online output  
11 from a generator that is already online and "dispatch" means the decision to  
12 operate an already committed generator at a certain megawatt output level. Once a  
13 unit has been committed and online above its economic minimum load, Duke  
14 Energy Kentucky predominantly follows PJM dispatch signals between its  
15 economic minimum load and economic maximum load.

16 Under the terms of PJM's Reliability Assurance Agreement, as a fixed  
17 resource requirement (FRR) entity and generation owner in PJM, Duke Energy  
18 Kentucky is under a must-offer requirement to offer all its generation committed  
19 to the FRR plan into the Day-Ahead Energy Market. The generating units are  
20 offered with designations including: Economic, Emergency, Must Run, and  
21 Unavailable. Units offered with a Must Run status will clear the market and are  
22 generally dispatched down or at minimum load during periods when the marginal  
23 cost of the unit is above LMP, or are dispatched up or at full load during periods

1 when the marginal cost of the unit is below LMP. Economic status units will  
2 generally be committed if their “all in” costs, including startup costs, are  
3 economic across the following day or during periods of the following day.  
4 Emergency status units are committed during an energy emergency event.  
5 Unavailable status units will not be considered by the commitment and dispatch  
6 model.

7 Each available generating unit is offered hourly with a segmented  
8 incremental energy price pair quantity and ancillary service offer curve across the  
9 unit’s operational range as well as a start-up cost, no-load cost, and operating  
10 parameters. Hourly offers are based on numerous factors, including but not  
11 limited to, the daily fuel cost, unit efficiency, emissions and variable operations  
12 and maintenance (O&M) costs, maximum and minimum loadings, and plant  
13 output availability and characteristics. Unit status is determined based upon unit  
14 availability, marginal energy costs, expected impact of certain PJM charges and  
15 credits, and anticipated market clearing prices. Generating unit day ahead awards  
16 are financially binding on both Duke Energy Kentucky and PJM.

17 As system conditions change between the day ahead market and the real  
18 time market, the Company maintains and updates its offers real time. In real time,  
19 Duke Energy Kentucky makes hourly updates to energy and ancillary service  
20 offers, primarily with respect to unit availability, but also considering unit  
21 operating parameters. Intra-day changes to fuel prices, especially for natural gas  
22 generating units are also considered to maintain accurate fuel pricing in its offers  
23 in the real time market. It is possible that in real time, despite receiving a day-

1 ahead energy award, PJM dispatch signals will instruct Duke Energy Kentucky  
2 plants to move to generation loadings other than their Day-Ahead award level.  
3 These instructions are based on the Real-Time energy and ancillary services needs  
4 of the overall system as manifested through LMP price signals at the generator  
5 bus. If real-time LMP is below a unit's marginal cost of energy, PJM will likely  
6 reduce output, or even delay or cancel a unit startup. Conversely, if system  
7 conditions have changed from day-ahead model assumptions, PJM may direct a  
8 Duke Energy Kentucky unit to start up even without a Day-Ahead energy award.  
9 Duke Energy Kentucky has an obligation and financial incentive to follow PJM  
10 dispatch instructions. When the unit is online and the unit's incremental cost offer  
11 price is greater than the LMP, under the fundamentals of economic dispatch, PJM  
12 will generally dispatch the output of the unit down between the economic  
13 maximum of the unit and economic minimum of the unit. Alternatively, when the  
14 unit is online and the unit's incremental cost offer price is less than LMP, under  
15 the fundamentals of economic dispatch, PJM will generally dispatch the output of  
16 the unit up between the economic minimum of the unit and economic maximum  
17 of the unit. There are times in which the Company will "self-schedule" a  
18 generator's output with PJM under circumstances that are required for safety,  
19 testing, plant operational requirements, or reliability reasons. During these  
20 circumstances, the unit would be dispatched at a specific loading level and would  
21 not be at the discretion of PJM for economic dispatch. The Company also can and  
22 does "self-schedule" the unit as Must Run in order to commit the unit as most

1 efficiently as possible, such as to ensure the unit to be committed from an offline  
2 state and to avoid uneconomic unit cycling.

3 Additionally, PJM co-optimizes Energy and Ancillary Services; thus, the  
4 Company's generators also offer ancillary service products such as regulation,  
5 synchronized and non-synchronized reserves or day-ahead scheduling reserves, in  
6 addition to energy. Additionally, the Company's generators can also supply black  
7 start and reactive reserve where applicable.

8 **Q. HOW DOES DUKE ENERGY KENTUCKY DETERMINE THE MANNER**  
9 **IN WHICH THE GENERATING UNITS ARE OFFERED INTO THESE**  
10 **MARKETS.**

11 A. The Company takes several factors into consideration when determining unit  
12 offers into the PJM energy and ancillary services market with the goal of portfolio  
13 management strategy being to maximize generating units' margin and to  
14 ultimately minimize customer costs. The Company conducts a daily morning  
15 meeting with station and dispatch personnel to discuss topics including but not  
16 limited to market conditions, weather conditions, unit availability, unit  
17 parameters, any scheduled or potential unit maintenance issues, and fuel  
18 availability to determine inputs for its generating offers and demand bids to PJM  
19 for the following day. The Company also constructs a daily profit and loss  
20 analysis that compares the unit's expected revenue to the incremental cost of the  
21 unit and provides an expected daily unit margin for the next three weeks based on  
22 expected market prices and expected unit variable costs. This profit and loss  
23 analysis provides company personnel insight to forecast expected margin of



1 generating units, determine expected commitment status of its generating units  
2 and to communicate market risk factors to station personnel pertaining to any  
3 potential maintenance issues impacting a generating unit. The Company's offer  
4 software utilizes up to date market fuel and emissions prices and up to date  
5 variable O&M costs and also up to date unit parameters including startup and no-  
6 load costs, min and max loads, ramp rates in order to build and submit its units'  
7 supply offers to PJM. The Company's Generation Dispatch and Operations  
8 personnel are responsible for submitting generating unit offers to PJM with input  
9 from several workgroups including but not limited to power and gas trading, oil  
10 and emissions trading, meteorology, load forecasting, fleet analytics, station  
11 personnel, outage scheduling personnel and others to maintain up to date and  
12 accurate generating unit offers and demand bids to PJM. Company Fuels and  
13 Systems Optimization personnel, which consists of personnel from Dispatch and  
14 Operations, Gas and Power Trading, Fleet Analytics and Fuel Procurement, also  
15 meet regularly to review generation and fuel forecasts, to discuss any fuel  
16 procurement challenges and to proactively monitor general supply conditions  
17 impacting the portfolio to maintain consistent communication across workgroups  
18 to effectively employ a portfolio management strategy to maximize generating  
19 unit margin and minimize customer costs.

1 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
2 **REQUESTS YOU ARE SPONSORING.**

3 A. I sponsor the Company's responses to Data Request Numbers 7, 12, 14, 15, 16,  
4 17, 20, 29, 30, 34 and 35. These responses were prepared by me and under my  
5 direction and control and are true and accurate.

### **III. CONCLUSION**

6 **Q. IN YOUR OPINION, WERE DUKE ENERGY KENTUCKY'S POWER**  
7 **PROCUREMENT PRACTICES REASONABLE DURING THE AUDIT**  
8 **PERIOD?**

9 A. Yes.

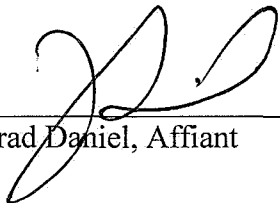
10 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

11 A. Yes.

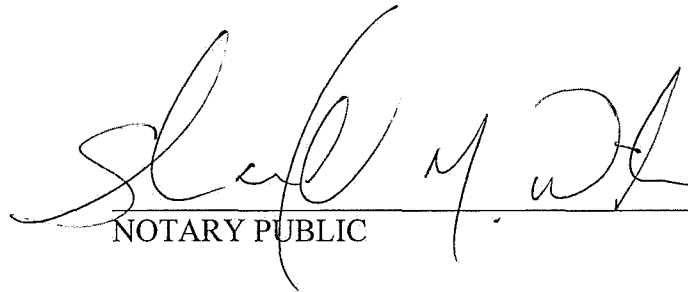
VERIFICATION

STATE OF NORTH CAROLINA     )  
  )  
COUNTY OF MECKLENBURG     )     SS:

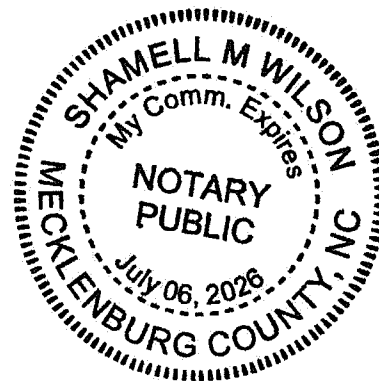
The undersigned, Brad Daniel, Director, Generation Dispatch and Operations, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
Brad Daniel, Affiant

Subscribed and sworn to before me by Brad Daniel on this 12 day of September, 2023.

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:



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

In the Matter of:

AN ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL ADJUSTMENT	)	
CLAUSE OF DUKE ENERGY KENTUCKY, INC.	)	Case No. 2023-00012
FROM NOVEMBER 1, 2020 THROUGH	)	
OCTOBER 31, 2022	)	

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**DIRECT TESTIMONY OF**  
**JIM MCCLAY**  
**ON BEHALF OF**  
**DUKE ENERGY KENTUCKY, INC.**

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September 22, 2023

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**I. INTRODUCTION AND PURPOSE**

1 **Q. STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is James J. McClay, III, and my business address is 525 South Tryon  
3 Street, Charlotte, North Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed as Managing Director of Natural Gas Trading for Duke Energy  
6 Corporation (Duke Energy).

7 **Q. PLEASE DESCRIBE BRIEFLY YOUR EDUCATIONAL BACKGROUND  
8 AND PROFESSIONAL EXPERIENCE.**

9 A. I received a Bachelor's Degree in Business Administration, majoring in Finance  
10 from St. Bonaventure University. I joined Progress Energy in 1998 as an Energy  
11 Trader, was promoted to Manager of Power Trading and held that position through  
12 early 2003. I then became the Director of Power Trading and Portfolio Management  
13 for Progress Energy Ventures through February 2007. From March 2007 through  
14 late 2008, I was the Director of Power Trading for Arclight Energy Marketing.  
15 From March 2009 through the present, I've been employed in various managerial  
16 roles at Progress Energy and Duke Energy overseeing Natural Gas and Oil trading,  
17 gas and power hedging, origination and procurement. Prior to my tenure with Duke  
18 Energy, I was employed for approximately 13 years in Capital Markets as a U.S.  
19 Government fixed income securities trader working with various banks and  
20 brokers/dealers.

1 **Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC SERVICE**  
2 **COMMISSION?**

3 A. Yes, I have testified in a previous fuel adjustment clause (FAC) proceeding before  
4 the Kentucky Public Service Commission (Commission).

5 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS MANAGING**  
6 **DIRECTOR OF NATURAL GAS TRADING.**

7 A. As Managing Director of Natural Gas Trading, I manage the organization  
8 responsible for the natural gas trading, optimization, origination and scheduling  
9 functions for the regulated gas-fired generation assets in the Carolinas (Duke  
10 Energy Carolinas and Duke Energy Progress), Duke Energy Florida, Duke Energy  
11 Indiana and Duke Energy Kentucky (collectively, the “Utilities”), as well as the  
12 organization responsible for power trading for Duke Energy Indiana and Duke  
13 Energy Kentucky. Additionally, I oversee the execution of the Utilities’ financial  
14 hedging programs, fuel oil procurement, and emissions trading.

15 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

16 A. The purpose of my testimony is to respond to Paragraph 4(a), (f), (g) & (h) of the  
17 Commission’s September 6, 2023 Order (Order), to more broadly discuss and  
18 support Duke Energy Kentucky’s fuel procurement practices and provide an  
19 overview of the Company’s participation in PJM as it pertains to the capacity  
20 market for the period November 1, 2020 through October 31, 2022. Finally, I  
21 sponsor several of Duke Energy Kentucky’s responses to the Commission’s Data  
22 Requests contained in Appendix B of its September 6, 2023 Order.

## II. DISCUSSION

1 **Q. PLEASE COMMENT GENERALLY ON THE REASONABLENESS OF**  
2 **DUKE ENERGY KENTUCKY'S GAS PROCUREMENT PRACTICES**  
3 **DURING THE REVIEW PERIOD.**

4 A. With respect to natural gas, the Company maintains supplier agreements to ensure  
5 natural gas can be procured at a competitive market price to meet the needs of the  
6 Company's gas generation fleet. The gas procurement personnel stay abreast of  
7 market trends and prices through real-time market electronic pricing platforms such  
8 as the Intercontinental Exchange (*i.e.* ICE) real-time price feeds, information  
9 published in trade publications, industry reports, and various interactions with  
10 suppliers and pipelines. As part of natural gas procurement, the gas personnel  
11 review daily forecasts of natural gas needed based on projected generation unit runs  
12 before making commitments to purchase natural gas. The Company's natural gas  
13 supply agreements enable the Company to procure the needed volume of natural  
14 gas at the most competitive price each day.

15 **Q. PLEASE DESCRIBE ANY CHANGES IN THE NATURAL GAS MARKET**  
16 **THAT OCCURRED DURING THE REVIEW PERIOD OR THAT DUKE**  
17 **ENERGY KENTUCKY EXPECTS TO OCCUR WITHIN THE NEXT TWO**  
18 **YEARS THAT HAVE SIGNIFICANTLY AFFECTED OR WILL**  
19 **SIGNIFICANTLY AFFECT DUKE ENERGY KENTUCKY'S NATURAL**  
20 **GAS PROCUREMENT PRACTICES.**

21 A. Duke Energy Kentucky did experience volatile natural gas market prices over the  
22 review period and expects the natural gas market to remain volatile in the future.



1 Natural gas prices are reflective of the dynamics between supply and demand  
2 factors, and in 2021 and 2022, such dynamics were influenced primarily by growth  
3 in export demand, stable production, lower than average U.S storage inventory  
4 balances and seasonal weather demand. Gas production's slow response to rising  
5 prices and the uncertainty of future coal deliveries placed continued stress on gas  
6 storage replenishment through much of 2022, keeping upward pressure on gas  
7 prices into the latter half of 2022. However, beginning in January 2023, moderate  
8 weather, increasing inventory storage balances and growing production have  
9 caused natural gas prices to sharply decline.

10 **Q. PLEASE DESCRIBE ANY ACTIONS DUKE ENERGY KENTUCKY HAS**  
11 **TAKEN TO MITIGATE THE HIGH COST OF FUEL FOR CUSTOMERS.**

12 A. As previously discussed in my testimony, the Company enters into physical gas  
13 supply enabling agreements with multiple gas suppliers to ensure natural gas can  
14 be procured at a competitive market price to meet the needs of the Company's gas  
15 generation fleet. When needed, Duke Energy Kentucky procures natural gas in the  
16 spot market to serve the Woodsdale CT unit dispatches. When purchasing firm  
17 natural gas for day ahead and intra-day dispatch schedules, the Company actively  
18 solicits bids from those gas suppliers with whom it has active supply agreements  
19 and purchases from the lowest cost supplier. A competitive solicitation with  
20 multiple counterparties ensures Duke Energy Kentucky is capturing the lowest  
21 market price gas for its customers.

1 **Q. PLEASE DESCRIBE HOW DUKE ENERGY KENTUCKY ADDRESSES**  
2 **CAPACITY SHORTFALLS DUE TO PLANNED OUTAGES BEING**  
3 **EXTENDED BEYOND THE ESTIMATED TIME OF THE OUTAGE.**

4 A. Duke Energy Kentucky participates in the PJM capacity market as a self-supply  
5 fixed resource requirement (FRR) entity using its own generation assets located in  
6 Duke Energy Ohio Kentucky (DEOK) locational zone to satisfy the PJM capacity  
7 requirements of the Reliability Pricing Model (RPM). Through the normal course  
8 of business, when Duke Energy Kentucky identifies a planned outage that will  
9 extend beyond its estimated time, the Company assesses the new schedule and  
10 evaluates if any mitigation actions, such as allocating existing uncleared capacity  
11 or purchasing replacement capacity from the PJM market is necessary. Based on  
12 the results of its evaluation the Company may purchase replacement capacity if  
13 necessary.

14 **Q. PLEASE DESCRIBE THE PJM CAPACITY MARKET.**

15 A. PJM's capacity market is called RPM, which is an acronym for Reliability Pricing  
16 Model. The purpose of RPM is to provide a market construct that enables PJM to  
17 secure adequate generation resources to meet the reliability needs of the regional  
18 transmission organization (RTO). The RPM construct and the associated rules  
19 regarding how PJM members participate in the PJM capacity market is described  
20 within the PJM Open Access Transmission Tariff (OATT) and Reliability  
21 Assurance Agreement (RAA). The PJM capacity market operates on a planning  
22 period that spans twelve months beginning June 1st and ending May 31st of each  
23 year (Delivery Year). In PJM, the capacity market structure is intended to provide

1 transparent forward market signals that support generation and infrastructure  
2 investment. There are two ways for a PJM member to participate in the RPM  
3 capacity structure: 1) through the RPM baseline procurement auctions; or 2) as a  
4 self-supply FRR entity. The baseline procurement auction is called a base residual  
5 auction (BRA). BRAs are typically conducted three years in advance of the actual  
6 Delivery Year in order to allow bidders to complete construction of projects that  
7 clear the BRA. The PJM capacity market is designed to provide incentives for the  
8 development of generation, demand response, energy efficiency, and transmission  
9 solutions through capacity market payments. Another key component of RPM is  
10 that price signals are locational and designed to recognize and quantify the  
11 geographical value of capacity. PJM divides the RTO into multiple sub-regions  
12 called locational delivery areas (LDA) in order to model the locational value of  
13 generation.

14 **Q. PLEASE EXPLAIN THE RECENT TIMING CHANGES IN THE PJM**  
15 **CAPACITY MARKETS?**

16 A. The 2025/2026 auction will occur in June 2024, the 2026/2027 auction in December  
17 2024, the 2027/2028 auction in June 2025, the 2028/2029 auction in December  
18 2025, and finally the 2029/2030 auction in May 2026 (back on PJM's Tariff  
19 schedule).

1 **Q. HAS THE DEOK DELIVERY ZONE SEPERATED AS A CONSTRAINED**  
2 **ZONE SINCE THE 2020/2021 PLANNING YEAR AS PREVIOUSLY**  
3 **REPORTED?**

4 A. Yes. In the BRA for the Delivery Year 2022/2023, the DEOK delivery zone  
5 separated as a constrained zone clearing at \$71.69/MW-Day as opposed to the  
6 \$50.00/MW-Day for the rest of the RTO. In the BRA for the Delivery Year  
7 2024/2025, the DEOK delivery zone separated as a constrained zone clearing at  
8 \$96.24/MW-Day as opposed to the \$28.92/MW-day clearing price for the rest of  
9 the RTO. This is relevant since Duke Energy Kentucky is required to provide  
10 capacity in its FRR plans that meet the requirements of the DEOK zone. As  
11 mandated by PJM, a certain percentage of such capacity must come from within  
12 the zone. This percentage varies from year to year. While the Company's owned  
13 generation at East Bend and Woodsdale stations meet that requirement, if satisfying  
14 upcoming FRR plans required purchases of additional short or long-term capacity,  
15 such capacity would need to meet those same requirements. The DEOK zone  
16 separation could impact market liquidity for capacity; particularly when combined  
17 with retirements of other generation in the zone. While this diminished liquidity  
18 has not impacted Duke Energy Kentucky to date, the Company is mindful of the  
19 potential impacts on capacity planning.

20 **Q. PLEASE BRIEFLY EXPLAIN PJM'S FRR PROCESS.**

21 A. The PJM OATT and RAA specify the obligations and compensation to Load  
22 Serving Entities (LSE) for supplying capacity. The FRR process is an alternative  
23 means for a PJM LSE such as Duke Energy Kentucky to satisfy its customer

1 capacity obligation under the PJM RAA. Under the FRR construct, an LSE must  
2 annually submit a preliminary three-year forward, and a final current year FRR  
3 capacity plan that meets a PJM defined customer capacity obligation (FRR Plan).  
4 The FRR Plan must identify the unit-specific generating or demand response  
5 resources that will be providing the capacity that will fulfill the LSE's customer  
6 obligation. FRR allows the LSE to match its customer reliability requirement to its  
7 own generation, demand response, energy efficiency and/or transmission resources,  
8 while still being permitted to sell some or all of its excess supply into RPM. Duke  
9 Energy Kentucky would face severe penalties and limitations on its ability to  
10 choose the FRR option if PJM were to deem either its initial or final FRR plans to  
11 be insufficient or it's generation otherwise non-compliant with PJM requirements.  
12 Duke Energy Kentucky annually submits both a preliminary and a final FRR Plan  
13 to PJM. These submittals are consistent with the Commission's Order in Case No.  
14 2010-00203 whereby the Commission required the Company to participate in PJM  
15 as an FRR entity until such time as it received Commission approval to participate  
16 in the PJM capacity auctions. To date, Duke Energy Kentucky has not requested  
17 such permission, but will do so if the Company determines that a change would be  
18 in the best interests of its customers and should be made. The Company continues  
19 to evaluate the merits of both an FRR entity but also considers benefits of becoming  
20 a full RPM auction participant.

1 **Q. PLEASE EXPLAIN WHAT BEING AN FRR ENTITY MEANS FOR DUKE**  
2 **ENERGY KENTUCKY.**

3 A. As an FRR entity, Duke Energy Kentucky must secure and commit unit-specific  
4 generation resources to meet the peak load capacity requirements for all of its  
5 customers in advance of the PJM’s annual BRA through its FRR Plan. Presently,  
6 the load requirements include both the forecasted load of Duke Energy Kentucky’s  
7 customers, as well as the reserve requirement for that load mandated by PJM. As  
8 the FRR plan timeline follows the RPM auction timeline, the Company will soon  
9 have to submit its initial FRR Plan for the delivery period spanning June 1, 2025  
10 through May 31, 2026, and its final FRR plan for the delivery period spanning June  
11 1, 2024 through May 31, 2025. Note that the 2025/2026 auction timing period was  
12 delayed and would have normally occurred prior to now.

13 The Duke Energy Kentucky FRR plan currently includes East Bend 2 and  
14 Woodsdale generating stations, as well as any bilateral capacity purchases required  
15 to meet customer demand.

16 **Q. PLEASE EXPLAIN THE PJM CAPACITY PERFORMANCE**  
17 **CONSTRUCT.**

18 A. In a stated effort to improve the reliability of generating resources in the PJM  
19 footprint, PJM redesigned the RPM with its “Capacity Performance” construct. In  
20 doing so, PJM redefined its capacity products and implemented new performance-  
21 based penalties. Capacity Performance Resources must be capable of sustained,  
22 predictable operation that allows resource to be available to provide energy and  
23 reserves during performance assessment hours throughout the Delivery Year.

1 Capacity Performance capacity is subject to non-performance charges assessed  
2 during emergency conditions throughout entire Delivery Year. Capacity  
3 Performance capacity must be available to the RTO during periods of high load  
4 demand or system emergency or face substantial performance penalties. With  
5 Capacity Performance, PJM adopted a no-excuses policy in order to improve  
6 reliability through a new penalty structure.

7 In this new construct, PJM transitioned all capacity in the footprint to  
8 Capacity Performance. In other words, all capacity purchased on behalf of the load  
9 through RPM or eligible for inclusion in FRR capacity plans must meet the  
10 Capacity Performance criteria.

11 **Q. HOW WOULD YOU CLASSIFY THE CURRENT DUKE ENERGY**  
12 **KENTUCKY RESOURCES IN TERMS OF COMPLIANCE WITH THE**  
13 **CAPACITY PERFORMANCE CONSTRUCT?**

14 A. East Bend 2 meets the minimum requirements of a Capacity Performance resource  
15 in that it is a coal fired facility with a significant reserve of fuel stored on-site. The  
16 Woodsdale Combustion Turbine facility now successfully meets the Capacity  
17 Performance requirements with the completion of the construction of its new dual  
18 fuel system on June 1, 2019. The primary fuel at Woodsdale is natural gas delivered  
19 under a non-firm delivery contract. Due to its low-capacity factor, it is not economic  
20 to maintain contracted firm natural gas transportation for the station. In order to  
21 meet the capacity performance requirements, the Company sought and received  
22 Commission authorization to construct a low sulfur diesel fuel system with onsite  
23 storage. The Company continues to evaluate Capacity Performance compliance

1 opportunities for its portfolio to increase their value and mitigate non-performance  
2 risks.

3 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
4 **REQUESTS YOU ARE SPONSORING.**

5 A. I sponsor the Company's responses to Data Request Numbers 6, 8, 9, 10, 11, 12,  
6 18, 21, and 31 in this proceeding. These responses were prepared by me and under  
7 my direction and control and are true and accurate.

### **III. CONCLUSION**

8 **Q. IN YOUR OPINION, WERE DUKE ENERGY KENTUCKY'S FUEL**  
9 **COSTS AND PROCUREMENTS DURING THE REVIEW PERIOD**  
10 **REASONABLE?**

11 A. Yes.

12 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

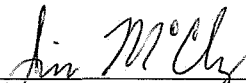
13 A. Yes.



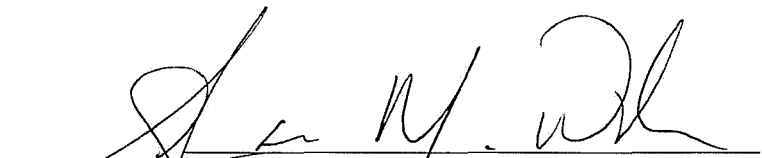
VERIFICATION

STATE OF NORTH CAROLINA        )  
  )        SS:  
COUNTY OF MECKLENBURG        )

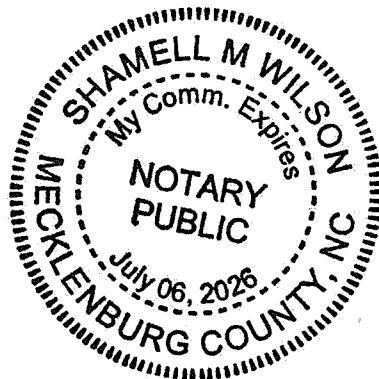
The undersigned, Jim McClay, Manager Director Natural Gas Trading, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
Jim McClay, Affiant

Subscribed and sworn to before me by Jim McClay on this 20<sup>th</sup> day of September 2023.

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:



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

**In the Matter of:**

AN ELECTRONIC EXAMINATION OF THE )  
APPLICATION OF THE FUEL ADJUSTMENT )  
CLAUSE OF DUKE ENERGY KENTUCKY, INC. ) Case No. 2023-0012  
FROM NOVEMBER 1, 2020 THROUGH )  
OCTOBER 31, 2022

---

**DIRECT TESTIMONY OF**  
  
**JOHN D. SWEZ**  
  
**ON BEHALF OF**  
  
**DUKE ENERGY KENTUCKY, INC.**

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September 22, 2023

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**I. INTRODUCTION**

1 **Q. STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is John D. Swez and my business address is 525 S. Tryon Street,  
3 Charlotte, North Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed as Managing Director, Trading and Dispatch, by Duke Energy  
6 Carolinas, LLC, a utility affiliate of Duke Energy Kentucky, Inc. (Duke Energy  
7 Kentucky or Company).

8 **Q. PLEASE DESCRIBE BRIEFLY YOUR EDUCATION AND**  
9 **PROFESSIONAL EXPERIENCE.**

10 A. I received a Bachelor of Science degree in Mechanical Engineering from Purdue  
11 University in 1992. I received a Master of Business Administration degree from  
12 the University of Indianapolis in 1995. I joined PSI Energy, Inc. in 1992 and have  
13 held various engineering positions with the Company or its affiliates in the  
14 generation dispatch or power trading departments. In 2003, I assumed the position  
15 of Manager, Real-Time Operations, on January 1, 2006, became the Director of  
16 Generation Dispatch and Operations, and finally assumed my current role on  
17 November 1, 2019.

18 **Q. HAVE YOU EVER TESTIFIED BEFORE THE KENTUCKY PUBLIC**  
19 **SERVICE COMMISSION?**

20 A. Yes, I have testified before the Kentucky Public Service Commission  
21 (Commission) on several occasions.

1 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS MANAGING**  
2 **DIRECTOR, TRADING & DISPATCH.**

3 A. As Managing Director, Trading and Dispatch of Duke Energy, I am responsible  
4 for Power Trading on behalf of Duke Energy's regulated utilities in the Carolinas  
5 and Florida and Generation Dispatch on behalf of Duke Energy's regulated  
6 utilities in Indiana, Ohio, and Kentucky. I am responsible for Duke Energy  
7 Kentucky's participation as a member of PJM Interconnection LLC (PJM) as it  
8 relates to the Company's generation dispatch, unit commitment, 24-hour real-time  
9 operations, and short-term maintenance planning. I am also responsible for the  
10 Company's submittal of supply offers in PJM's day-ahead and real-time electric  
11 energy (collectively Energy Markets) and ancillary services markets (ASM), as  
12 well as managing the Company's short-term supply position to ensure that the  
13 Company has adequate economic resources committed to serve its retail  
14 customers' electricity needs. I also work closely with the teams responsible for  
15 managing the Company's capacity position with respect to meeting its Fixed  
16 Resource Requirement (FRR) obligation as a member of PJM.

17 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

18 A. The purpose of my testimony is to respond to the Commission's September 6,  
19 2023 Order and specifically to address changes in the wholesale electric power  
20 market that the Company expects to occur within the next two years that will  
21 affect Duke Energy Kentucky's power procurement practices, a discussion of the  
22 Company's overall participation in PJM, and the cost-benefit analysis Duke  
23 Kentucky performed regarding its participation in the PJM capacity market as an

1 FRR Capacity Construct Member. In doing so, I discuss the customer benefits that  
2 the Company's PJM membership provides and describe recent and proposed  
3 market changes by PJM and the Federal Energy Regulatory Commission that may  
4 impact both the Company and Duke Energy Kentucky's customers going forward.

## II. DISCUSSION

5 **Q. PLEASE PROVIDE A BRIEF OVERVIEW OF HOW DUKE ENERGY**  
6 **KENTUCKY MEETS ITS KENTUCKY LOAD OBLIGATIONS.**

7 A. Duke Energy Kentucky currently owns and operates approximately 1,076 net  
8 installed megawatts (MW) of summer generating capacity, provided by two  
9 assets. Base load requirements are met by the East Bend Unit 2 Generating  
10 Station (East Bend). East Bend is a 600-megawatt (MW) (net rating) coal-fired  
11 base load unit located along the Ohio River in Boone County, Kentucky. The  
12 Company meets its peaking requirements with the Woodsdale Generating Station  
13 (Woodsdale). Woodsdale is a 476 MW (net summer rating) six-unit natural gas-  
14 fired combustion turbine (CT) facility with fuel oil back-up located in Trenton,  
15 Ohio. The net ratings represent the amount of power that the Company can  
16 dispatch from the plants after some portion of the gross power output is used to  
17 power the plant machinery.

18 Additionally, the Company has 9.3 MW of solar assets consisting of the  
19 nameplate ratings of Walton 1 (2 MW), Walton 2 (2 MW), Crittenden (2.8 MW),  
20 and Aero Solar (2.5 MW) site with the combined net firm summer capacity at all  
21 four solar sites of 3.9 MW. These assets are connected at the distribution level and  
22 thus, from PJM's perspective are behind the meter, meaning these generating

1 assets reduce the customer demand as seen from PJMs perspective, but are not  
2 separately dispatched into the market.

3 Collectively, East Bend and Woodsdale generating assets are dispatched  
4 into PJM, which maintains functional control of the transmission system within its  
5 footprint including the Duke Energy Ohio/Kentucky (DEOK) system. To the  
6 extent Duke Energy Kentucky can monetize its assets to produce off-system sales  
7 through PJM, customers receive the majority of those net revenues (or costs)  
8 through the Company's profit-sharing mechanism (Rider PSM).

9 **Q. PLEASE GENERALLY DESCRIBE DUKE ENERGY KENTUCKY'S**  
10 **MEMBERSHIP IN PJM.**

11 A. Duke Energy Kentucky is a member of PJM, the nation's first fully functioning  
12 Regional Transmission Organization (RTO) that operates the power grid and  
13 wholesale electric market for all or parts of thirteen states and the District of  
14 Columbia. This electric market consists of energy markets, capacity markets,  
15 ancillary services markets (ASM), and a Financial Transmission Rights (FTR)  
16 market. PJM's operation is governed by agreements approved by the Federal  
17 Energy Regulatory Commission (FERC) including the Operating Agreement,  
18 Open Access Transmission Tariff (OATT), and the Reliability Assurance  
19 Agreement (RAA).

20 As discussed in the direct testimony of Witness Daniel, as a member of  
21 PJM, Duke Energy Kentucky is subject to these agreements, which among other  
22 things, require Duke Energy Kentucky to offer its available generation to PJM  
23 and to purchase its customer energy load from the PJM Day-Ahead or Real-Time

1 Energy Markets. The Day-Ahead and Real-Time Energy Markets are collectively  
2 referred to as the PJM Energy Market for the remainder of my testimony.  
3 Additionally, as discussed in the direct testimony of Witness McClay, Duke  
4 Energy Kentucky participates in the PJM capacity market as a self-supply FRR  
5 entity using its own generation assets located in DEOK Locational Delivery Area  
6 (LDA) to satisfy the PJM capacity requirements.

7 **Q. HAS DUKE ENERGY KENTUCKY PERFORMED ANY COST-BENEFIT**  
8 **ANALYSIS REGARDING MAINTAINING ITS OVERALL**  
9 **PARTICIPATION IN PJM?**

10 A. The Company has not performed any cost-benefit analysis regarding its overall  
11 participation in PJM. Due to the Company's relatively small size and the fact that  
12 it is largely dependent on the DEOK transmission system, the significant costs of  
13 exiting PJM, and impractical/uneconomic operation outside of an RTO due to the  
14 additional expenses associated with balancing load and generation, such an  
15 analysis would intuitively produce a result demonstrating exiting PJM would not  
16 be beneficial to customers. Duke Energy Kentucky's customers currently benefit  
17 significantly from PJM's centrally dispatched RTO construct.

18 **Q. HAS DUKE ENERGY KENTUCKY PERFORMED ANY ANALYSIS**  
19 **REGARDING THE COMPANY STRATEGY FOR PARTICIPATION IN**  
20 **PJM'S CAPACITY MARKET? PLEASE EXPLAIN.**

21 A. As the Commission is aware, there are two ways for a PJM member to participate  
22 in the PJM capacity market; either through the RPM Base Residual Auction  
23 (BRA) and subsequent incremental auctions, or as a self-supply FRR entity. The



1 Company periodically reviews its capacity market participation to determine  
2 whether remaining an FRR entity remains in customers' best interests. The most  
3 recent evaluation occurred in early 2023. As I explain below, the conclusion is  
4 that since 2012 when first entering PJM as an FRR entity, this arrangement has  
5 been the logical decision and has benefited customers. However, with the  
6 potential for large customer load growth, the corresponding need for flexibility of  
7 Duke Energy Kentucky generation supply decisions, and upcoming PJM capacity  
8 market changes, a future move to full RPM auction participation may be in our  
9 customer's interest.

10 **Q. PLEASE EXPLAIN THIS EVALUATION IN DETAIL.**

11 A. The Company examined the capacity market options and examined the  
12 differences breaking them down into six different impacts: (1) Minimum Offer  
13 Price Rule (MOPR); (2) Hold Back for FRR members; (3) Reserve Margin  
14 Differential; (4) FRR deficiency penalties; (5) Market Liquidity Differences; and  
15 (6) Physical vs. Financial Capacity Performance penalty option.

16 A brief summary and analysis of each item is discussed below:

17 **1) MOPR** – Recently, clarification has occurred with regards to PJM's MOPR  
18 ruling that impact RPM participation. Prior to this rule change, if Duke  
19 Energy Kentucky were to switch to an RPM member, there was the potential  
20 that Duke Energy Kentucky would be required to offer certain generation  
21 resources into the RPM auctions at a minimum price that was potentially so  
22 high that the resource could not clear in the RPM auctions (either the BRA or  
23 a subsequent incremental auction). Thus, the potential existed for Duke

1 Energy Kentucky to “pay twice” for capacity; once to build/maintain a  
2 generation asset and again to purchase capacity for its load in the capacity  
3 auctions. If the Company’s asset didn’t clear the auction, there would be no  
4 generation revenues to offset the load purchase.

5 Today, there are now two conditions that must be true in order to eliminate  
6 this MOPR risk. The first condition is that Duke Energy Kentucky doesn’t  
7 have Buyer-Side Market Power (BSMP), which occurs when a Load Serving  
8 Entity (LSE) offers generation at a lower price to reduce its overall exposure  
9 to the market. The second condition is that Duke Energy Kentucky doesn’t  
10 have Conditioned State Support, which occurs if a state is giving a unit  
11 subsidization based on how the unit is offered (priced) into the capacity  
12 market. For the most recent planning year, Duke Energy Kentucky certified  
13 that these two conditions did not occur, and PJM agreed with that  
14 determination.

- 15 • The new MOPR rule virtually eliminates the MOPR risk and makes Duke  
16 Energy Kentucky indifferent to participation in FRR or RPM.

17 **2) Hold Back for FRR members** – As Duke Energy Kentucky has done in  
18 recent auctions, FRR entities are required to hold back generation equivalent  
19 of 3 percent of their load if they have excess generation that they want to  
20 monetize in the BRA auction or first and second incremental auctions. Thus,  
21 since Duke Energy Kentucky is an FRR member, it must hold back (cannot  
22 offer) approximately 30 MW in the BRA or first two incremental auctions.

1 This restriction would not exist if the Company became a full RPM participant  
2 and left the FRR status.

- 3 • A move to RPM allows Duke Energy Kentucky to monetize this  
4 additional capacity and is an advantage of RPM. The financial impact to  
5 the Duke Energy Kentucky customers from removal of this Hold Back is  
6 added to the Reserve Margin Differential in 3) below.

7 **3) Reserve Margin Differential** – FRR entities are required to purchase a fixed  
8 reserve margin, which is approximately 15 percent. However, RPM entities  
9 purchase on a sloped demand curve, which can cause additional purchases as  
10 the price of the auction moves lower, meaning that at lower prices, loads  
11 purchase more capacity to ensure greater reliability.

- 12 • The net financial impact to Duke Energy Kentucky customers of the Hold  
13 Back from above (a benefit of moving to RPM), plus the Reserve Margin  
14 Differential (a benefit of remaining FRR), at an average clearing price, is  
15 approximately a cost of \$1.8 million per year. Meaning that by remaining  
16 in the FRR today and not switching to RPM, the Company believes that it  
17 is saving approximately \$1.8 million annually for the Duke Energy  
18 Kentucky customers.

19 **4) FRR deficiency penalties** – Potential FRR deficiency penalties can be very  
20 severe if Duke Energy Kentucky is unable to meet its FRR plan submitted  
21 prior to the BRA. A potential FRR deficiency penalty can occur due to an  
22 increase in customer demand or through a reduction in Duke Energy  
23 Kentucky’s generation capacity value. This penalty is two times the Cost of

1 New Entry (CONE) rate for the relevant location, in \$/MW-day, multiplied by  
2 the shortfall.

3 As an example, for every 100 MW the Company is short in its initial FRR  
4 plan, a penalty greater than \$15 million is possible. Thus, if the Company  
5 were short 600 MW, a penalty of over \$100 million is possible, along with  
6 highly likely FERC referral and even possible removal from FRR status. Due  
7 to this severe penalty, it is critical that Duke Energy Kentucky meet its annual  
8 initial FRR plan. If the Company were to have large customer load locate in  
9 its territory and not be able to contract or construct unit-specific generation  
10 fast enough or gets closer to a potential East Bend retirement and replacement  
11 generation date, this risk is enhanced. Finally, a lesser penalty can also occur  
12 for a final FRR plan deficiency equal to 1.2 multiplied by the BRA clearing  
13 price.

- 14 • Participation in RPM eliminates the potential for a large FRR deficiency  
15 penalty.

16 **5) Market Liquidity Differences** – FRR entities cannot access the PJM RPM  
17 auction to purchase capacity for shortfalls to fulfill its FRR plan. A shortfall to  
18 the FRR plan could be caused by a sudden customer load addition, changes in  
19 generation supply due to a retirement, or unexpected change in a units  
20 Equivalent Forced Outage Rate (EFOR). FRR participants need to purchase  
21 unit specific bilateral contracts, as required by the FRR construct. An added  
22 challenge of meeting the Company’s FRR plan is the PJM minimum internal  
23 resource requirement, which is the FRR requirement for the Company to

1 locate a certain percentage of generation within the DEOK LDA zone.  
2 Although currently the requirement is a relatively low 34 percent, this  
3 required percentage can change every year and is dependent on how much the  
4 DEOK zone is constrained. Thus, depending on the minimum internal  
5 resource requirement, if a shortfall existed and the Company were to pursue a  
6 bi-lateral contract as a remedy, the Company may be required to contract part  
7 or all this supply from the DEOK zone, limiting its options. In addition, if  
8 from within DEOK or outside, sellers may be reluctant to make offers, or  
9 offers that are received are likely to be at prices higher than expected auction  
10 clearing prices so that sellers avoid selling at below the auction clearing price.  
11 Thus, shortfalls may not be able to be managed with the options available in  
12 the FRR and present an additional risk of not meeting the FRR plan with the  
13 penalties discussed above.

- 14 • Participation in RPM eliminates the issue of bi-lateral market illiquidity,  
15 but the Company could be subject to a high zonal price in RPM in the  
16 event the DEOK zone separates as a constrained zone. This is discussed in  
17 more detail in Witness McClay's direct testimony in this case.

18 **6) Physical vs. Financial Capacity Performance penalty option** – Prior to a  
19 generating unit being assessed a capacity performance penalty, FRR members  
20 have the choice to elect having a physical capacity performance penalty  
21 option instead of a financial charge. This optionality is not available to RPM  
22 participants. In lower capacity price environments, the FRR physical penalty

1 option tends to be a lower cost alternative than the financial option, thus there  
2 is currently a benefit to remaining an FRR entity.

3 • During times of *lower* PJM capacity market prices, the equivalent  
4 financial cost of a physical capacity performance penalty is less than the  
5 financial capacity performance penalty. Conversely, during times of  
6 *higher* PJM capacity market prices, the equivalent financial cost of a  
7 physical capacity performance penalty is roughly equal to the financial  
8 capacity performance penalty. Thus, with current relatively low capacity  
9 price levels, the physical capacity performance penalty option is a lower  
10 cost alternative than that available under participation as an RPM member.

11 Summarizing all the above, the Company believes that remaining in the  
12 FRR capacity construct is currently the right option for Duke Energy Kentucky's  
13 customers. However, as the Company gets closer to a potential retirement of a  
14 generation resource, or if large additional loads enter the Duke Energy Kentucky  
15 service territory, or if PJM capacity market rules are changed, progression to the  
16 auction-based membership may make sense at that time. Further, changes to the  
17 PJM capacity construct currently being discussed may necessitate a change away  
18 from FRR as well.

1 **Q. PLEASE DESCRIBE POTENTIAL CHANGES IN THE PJM CAPACITY**  
2 **CONTRACT THAT MAY DRIVE DUKE ENERGY KENTUCKY TO**  
3 **MOVE FROM THE FRR TO THE AUCTION-BASED CAPACITY**  
4 **CONTRACT.**

5 A. Currently, PJM is undertaking a Critical Issue Fast Path (CIFP) process with  
6 respect to its capacity market design. Although several different changes have  
7 been discussed recently, to date, PJM has not made a filing to FERC. However,  
8 one is expected this Fall. The following is a partial listing of potential changes  
9 that could impact the Company's decision to remain an FRR member or seek  
10 Commission approval to transition becoming an RPM participant:

11 **1) Modification to the Capacity Performance Construct:** Elimination of the  
12 physical Capacity Performance penalty option for the FRR has been discussed  
13 as a potential modification. As I previously discussed, this optionality is a  
14 benefit to participation as an FRR member. Losing this optionality would  
15 erode a significant benefit that currently exists to FRR members.

16 **2) Creation of a Seasonal Market:** Most potential designs point to the creation  
17 of a seasonal construct with both Summer and Winter capacity market. The  
18 impact of such a change on the Duke Energy Kentucky customer is uncertain  
19 at this time. Further analysis would be necessary to determine whether the  
20 FRR strategy remains in the best interests of customers in a seasonal market  
21 construct.

22 **3) Synchronization of FRR and RPM requirements:** There has been  
23 discussion of raising the reserve margin for FRR entities to align with

1 requirements that exist under the RPM participation construct. If this occurs,  
2 the synchronization will eliminate a benefit of Duke Energy Kentucky's  
3 participation as an FRR member.

4 **4) FRR Deficiency Penalties:** Discussion has occurred that lowers the initial  
5 (three-year out) FRR Deficiency Penalty, but also raises the prompt year  
6 (occurring just prior to the delivery year) FRR Deficiency Penalty. Although  
7 the initial penalty could be reduced, the change to the FRR deficiency  
8 penalties in the prompt year FRR are perceived as being a greater impact,  
9 thus, the net of this is likely to be an advantage to moving to full auction  
10 participation.

11 **Q. DO YOU BELIEVE THE CAPACITY CONSTRUCT CHANGES THAT**  
12 **PJM IS LIKELY TO PROPOSE ARE HARMFUL TO DUKE ENERGY**  
13 **KENTUCKY OR ITS CUSTOMERS?**

14 A. Duke Energy Kentucky closely follows and fully participates in the PJM  
15 stakeholder process and closely monitors its current energy and capacity market  
16 participation as well as potential future changes. On balance, Duke Energy  
17 Kentucky supports PJM's emphasis on resource adequacy and the CIFP process  
18 as a need to enhance PJM's capacity market rules to maintain reliability as the  
19 PJM footprint's generation resource mix evolves. However, Duke Energy  
20 Kentucky shares the concerns raised by various stakeholders throughout this  
21 process regarding the inherent risks associated with fast-tracking complex and  
22 significant market rule changes. The Company is particularly mindful of market  
23 changes that impact Duke Energy Kentucky's ability to effectively utilize its



1 generation fleet as a hedge against short term capacity and energy prices. Since  
2 the proposed capacity market rule changes are uncertain at this time, the  
3 Company will bring opportunities that may arise in the event significant changes  
4 occur to the Commission's attention so to better position the Duke Energy  
5 Kentucky's customers.

6 **Q. DO YOU BELIEVE DUKE ENERGY KENTUCKY'S CUSTOMERS**  
7 **BENEFIT FROM THE COMPANY'S MEMBERSHIP IN PJM?**

8 A. Yes. Duke Energy Kentucky's customers benefit significantly from PJM's  
9 centrally dispatched RTO construct. PJM dispatches generation in broad  
10 consideration of total RTO cost minimization, the benefits of which are directly  
11 passed to customers in the form of energy alternatives to owned generation.  
12 Further, these markets provide an opportunity for non-native sales from the  
13 Company's generation, with a majority of the proceeds given back to Duke  
14 Energy Kentucky's customers through a credit on their bills. PJM's focus is on  
15 maintaining and improving reliability across its entire system, which directly  
16 translates to more efficient and reliable access to electric resources to serve  
17 Kentucky demand.

III. **CONCLUSION**


18 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

19 A. Yes.

**VERIFICATION**

STATE OF NORTH CAROLINA        )  
  )        SS:  
COUNTY OF MECKLENBURG        )

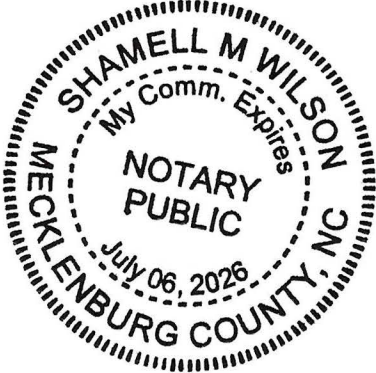
The undersigned, John Swez, Managing Director Trading & Dispatch, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing rebuttal testimony and that it is true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
John Swez Affiant

Subscribed and sworn to before me by John Swez on this 12<sup>th</sup> day of September 2023.

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:



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

In the Matter of:

AN ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL ADJUSTMENT	)	
CLAUSE OF DUKE ENERGY KENTUCKY, INC.	)	Case No. 2023-00012
FROM NOVEMBER 1, 2020 THROUGH	)	
OCTOBER 31, 2022	)	

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**DIRECT TESTIMONY OF**  
**KIMBERLY HUGHES**  
**ON BEHALF OF**  
**DUKE ENERGY KENTUCKY, INC.**

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September 22, 2023

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**I. INTRODUCTION AND PURPOSE**

1 **Q. STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Kimberly Hughes, and my business address is 525 S. Tryon Street ,  
3 Charlotte, North Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed as Director of Coal Origination, by Duke Energy Progress, Inc., a  
6 utility affiliate of Duke Energy Kentucky, Inc. (Duke Energy Kentucky, or  
7 Company).

8 **Q. PLEASE DESCRIBE BRIEFLY YOUR EDUCATIONAL BACKGROUND  
9 AND PROFESSIONAL EXPERIENCE.**

10 A. I am a 1996 graduate of Northern Kentucky University where I received a  
11 Bachelor of Science Degree in Business Administration. I began my career with  
12 Duke Energy's predecessor Cinergy Corp. in September 1997. I have held various  
13 positions in Human Resources, Power Trading, and Coal Procurement. I became  
14 Manager of Coal Origination and Contract Administration for Duke Energy in  
15 2020. In November 2022, I assumed my current position as Director, Coal  
16 Origination.

17 **Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC  
18 SERVICE COMMISSION?**

19 A. Yes, I have testified in a previous fuel adjustment clause (FAC) proceeding before  
20 the Kentucky Public Service Commission (Commission).

21

1 **Q. PLEASE SUMMARIZE YOUR DUTIES AS DIRECTOR OF COAL**  
2 **ORIGINATION.**

3 A. As Director of Coal Origination, I oversee Duke Energy’s Coal Procurement  
4 Group. I am ultimately responsible for all aspects of the procurement of coal and  
5 reagents in the five regulated jurisdictions (Kentucky, Indiana, Florida, North  
6 Carolina, and South Carolina) that encompass Duke Energy regulated electric  
7 utilities’ collective footprint. As part of this responsibility, I review forecasts of  
8 supply and demand, price, quality, availability, and deliverability. These coal  
9 forecasts cover both existing supply sources and potential supply sources that may  
10 be economically developed. On behalf of Duke Energy Kentucky, I also supervise  
11 the Company’s coal procurement activities, including the evaluation, negotiation,  
12 and oversight of coal purchase contracts.

13 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

14 A. The purpose of my testimony is to respond to Paragraph 4(a)-(e) and (g) of the  
15 Commission’s September 6, 2023 Order (“Order”), to more broadly discuss and  
16 support Duke Energy Kentucky’s fuel procurement practices from November 1,  
17 2020 through October 31, 2022. Finally, I sponsor several of Duke Energy  
18 Kentucky’s responses to the Commission’s Data Requests contained in Appendix  
19 B of its Order.

## II. DISCUSSION

1 Q. PLEASE COMMENT GENERALLY ON THE REASONABLENESS OF  
2 DUKE ENERGY KENTUCKY'S COAL PROCUREMENT PRACTICES  
3 DURING THE REVIEW PERIOD.

4 A. Duke Energy Kentucky's coal procurement policy is designed to assure that we  
5 procure a reliable and consistent supply of appropriate quality coal for our coal  
6 generating station at an economic price. Coal is generally purchased under long-  
7 term contracts of one to three years in length. The Company secures both its spot  
8 (one year or less) and long-term coal supply from producers through competitive  
9 bid processes, that are evaluated thoroughly, taking into account coal quality,  
10 quantity, transportation alternatives and price, among other factors. The producer  
11 (or producers) whose coal offers the best value, particularly with regard to overall  
12 utilization costs, is selected for further negotiations to produce contracts. The  
13 Company's long-term contracts may contain provisions for periodic price  
14 adjustments or a mechanism to adjust prices based upon published market price  
15 indices. The Company has established guidelines for the amounts of coal to be  
16 placed under contract during a specific period of time, and the Coal Procurement  
17 Group follows these guidelines.

18 The Company's Coal Procurement Group stays continually informed as to  
19 the current market for spot and contract coal and strategic opportunities for the  
20 purchase of such coal. Coal supply needs are determined by an ongoing review of  
21 generating station stockpiles, consumption projections, and current coal supply  
22 quantities already contracted. In addition, Duke Energy's Coal Procurement

1 personnel maintain frequent communication with the coal producers and visit  
2 mining operations as needed which assists in the Company's analysis of external  
3 coal market conditions. This information, coupled with constant monitoring of  
4 pricing information published in various places (e.g. industry newsletters, trade  
5 publications, regulatory filings, etc.), as well as a close review of the weekly spot  
6 market pricing indices published by brokers and traders provides a thorough  
7 understanding of the various spot and long-term alternatives for coal supply.

8 **Q. PLEASE DESCRIBE THE MODELING OUTPUTS THE COMPANY**  
9 **USES TO ASSIST IN EVALUATING ITS PROCUREMENT NEEDS.**

10 A. Since late 2020, Duke Energy Kentucky has used the outputs from the Fleet  
11 Analytics Stochastic Tool "FAST" model as the basis for its fuel procurement  
12 planning process.

13 **Q. PLEASE EXPLAIN THE STOCHASTIC MODEL CAPABILITIES.**

14 A. The stochastic model uses historic weather information to simulate numerous  
15 scenarios of future weather and commodity prices. For each of these scenarios,  
16 system load and commodity prices (gas, coal, oil and power) are all calculated in  
17 a correlated manner using historical correlations with each other and with  
18 weather. The resulting forecasts of this stochastic model give the Company not  
19 only expected fuel burns, but also the range of fuel burns and the probability  
20 associated with each range.



1 **Q. PLEASE DESCRIBE THE COAL SUPPLIER'S ADHERENCE TO**  
2 **CONTRACT DELIVERY SCHEDULES DURING THE REVIEW**  
3 **PERIOD.**

4 A. During the review period, the Company received approximately 92 percent of all  
5 contracted coal during the agreed upon delivery schedule. The amount of contract  
6 delivery shortfalls were caused by typical operational and logistical delays. The  
7 Company maintained adequate inventory levels and a reliable supply of fuel  
8 during the review period.

9 **Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S EFFORTS TO**  
10 **ENSURE COAL ADHERENCE TO CONTRACT DELIVERY**  
11 **SCHEDULES DURING THE REVIEW PERIOD.**

12 A. Duke Energy Kentucky constantly monitors and enforces the provisions of our  
13 coal contracts with respect to quantities and qualities of coal due the Company.  
14 The Company monitors supplier performance monthly and determines the causes  
15 of any supplier's under-performance for quantity or quality. If our review  
16 determines that the supply shortages were not the result of a Force Majeure event,  
17 we will either work with the particular supplier to determine a new alternate  
18 delivery schedule or seek remedies per the terms of the contract. In either case, we  
19 preserve as much of the market value as possible. All coal contracts contain  
20 quality adjustment provisions to account for the differences between the actual  
21 coal quality shipped and the contracted quality. Monthly quality pricing  
22 adjustments are made per the terms of the contract which include penalties for  
23 non-conforming shipments of coal. Contracts also contain terms stating if

1 shipments are not in compliance with contract specifications, the Company has  
2 the ability to suspend deliveries and terminate the contract if quality deficiencies  
3 cannot be corrected.

4 **Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S EFFORTS TO**  
5 **MAINTAIN THE ADEQUACY OF ITS COAL SUPPLIES IN LIGHT OF**  
6 **ANY SUPPLIER'S INABILITY OR UNWILLINGNESS TO MAKE**  
7 **CONTRACT DELIVERIES.**

8 A. The Company executes a strategy of supplier diversity to reduce the potential for  
9 a disruption in supply and to minimize the impact due to a supplier's inability or  
10 unwillingness to make contract deliveries. As mentioned earlier, the Company  
11 monitors supplier delivery performance monthly as part of a strong adherence to  
12 contract administration. The Company also closely monitors actual coal burns,  
13 actual coal inventories and projected coal burns and inventories. If a supplier fails  
14 to make contracted deliveries per the agreed upon schedule, the Company  
15 immediately notifies the supplier and discusses the reasons and nature of the  
16 shortfall. Depending upon the nature of the failure to perform, the parties either  
17 agree to reschedule the missed shipments or the Company looks to pursue the  
18 legal remedies for non-performance under the terms of the agreement. The  
19 Company then factors any shortfall or agreed upon make up schedule for missed  
20 tons into the forward plans for projected inventories. If the missed shipments will  
21 lead to a situation where the Company's coal inventories will fall below  
22 established inventory guidelines, the Company will purchase replacement coal  
23 through its competitive bid process.

1 **Q. WERE THERE ANY CHANGES IN COAL MARKET CONDITIONS**  
2 **THAT OCCURRED DURING THE REVIEW PERIOD OR THAT DUKE**  
3 **ENERGY KENTUCKY EXPECTS TO OCCUR IN THE NEXT TWO**  
4 **YEARS THAT HAVE SIGNIFICANTLY AFFECTED OR WILL**  
5 **SIGNIFICANTLY AFFECT DUKE ENERGY KENTUCKY’S COAL**  
6 **PROCUREMENT PRACTICES?**

7 A. Coal markets continue to experience a high degree of market volatility due to a  
8 number of factors, including: (1) the inability of coal suppliers to respond timely  
9 to changes in demand; (2) natural gas price volatility; (3) continued uncertainty  
10 regarding proposed and imposed U.S. Environmental Protection Agency (“EPA”)  
11 regulations for power plants; (4) increased demand in global markets for both  
12 steam and metallurgical coal; (5) tightened access to investor financing; (6)  
13 continued shifts in production from thermal to metallurgical coal as producers  
14 move away from supplying declining electric generation to take advantage of  
15 increasing demand from industry; and, (7) continued labor and resource  
16 constraints further limiting suppliers’ operational flexibility. In addition, the coal  
17 supply chain experienced significant challenges throughout 2021 and 2022 as  
18 historically low utility stockpiles combined with rapidly increasing demand for  
19 coal, both domestically and internationally, made procuring additional coal supply  
20 increasingly challenging. Producers were largely unable to respond to this rapid  
21 rise in demand due to capacity constraints resulting from labor and resource  
22 shortages. These factors combined to drive both domestic and export coal prices  
23 to record levels by late 2021 and limited coal supply availability. Continued labor

1 and resource constraints, including the on-going threat of a rail strike in Q4 2022,  
2 caused prices to remain elevated over the course of 2022. Going into winter 2022  
3 (Dec '22-Feb '23), coal commodity costs remained at historically high levels but  
4 began to soften in response to rapidly declining natural gas prices and an overall  
5 lack of winter weather demand. Although the lack of coal demand through the  
6 first half of calendar year 2023 has resulted in lower published coal market prices,  
7 coal producers are seeing the inflationary impacts of rising costs associated with  
8 mining operations including, but not limited to, labor and equipment costs putting  
9 additional pressure on their ability to respond to changes in market demand.

10 **Q. PLEASE DESCRIBE ANY ACTIONS TAKEN BY DUKE ENERGY**  
11 **KENTUCKY TO MITIGATE HIGH FUEL PRICES FOR CUSTOMERS.**

12 A. The Company continues to maintain a comprehensive coal procurement strategy  
13 that has proven successful over the years in limiting average annual fuel price  
14 changes while actively managing the dynamic demands of its fossil fuel  
15 generation in a reliable and cost-effective manner. With respect to coal  
16 procurement, the Company's procurement strategy includes: (1) the use of  
17 staggered coal contract expirations in order to limit exposure to forward market  
18 price changes; (2) maintaining a diversified mix of suppliers and supplier sources;  
19 (3) having an appropriate mix of term contract and spot purchases for coal. The  
20 Company conducts spot market solicitations as needed to supplement term  
21 contract purchases, taking into account changes in projected coal burns and  
22 existing coal inventory levels. Additionally, the Company negotiates coal  
23 transportation contracts that support secure, reliable deliveries.

1 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
2 **REQUESTS YOU ARE SPONSORING.**

3 A. I sponsor the Company's responses to Data Request Numbers 1, 2, 3, 4, 5, 8, 9,  
4 10, 11, 18, 21, 22, and 36 in this proceeding. These responses were prepared by  
5 me and under my direction and control and are true and accurate.

### **III. CONCLUSION**

6 **Q. IN YOUR OPINION, WERE DUKE ENERGY KENTUCKY'S FUEL**  
7 **COSTS AND PROCUREMENTS DURING THE REVIEW PERIOD**  
8 **REASONABLE?**

9 A. Yes.

10 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

11 A. Yes.

VERIFICATION

STATE OF NORTH CAROLINA )  
 )  
COUNTY OF MECKLENBURG ) SS:

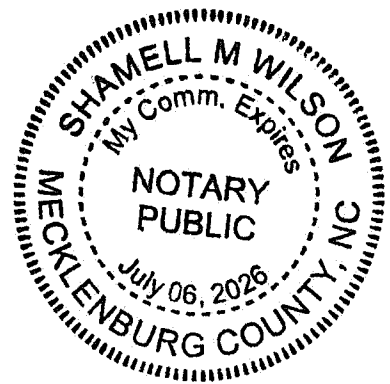
The undersigned, Kimberly A. Hughes, Director, Coal Origination, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of her knowledge, information and belief.

*Kimberly A. Hughes*  
\_\_\_\_\_  
Kimberly A. Hughes, Affiant

Subscribed and sworn to before me by Kimberly A. Hughes on this 19<sup>th</sup> day of September, 2023.

*Shamell M. Wilson*  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:



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

In the Matter of:

AN ELECTRONIC EXAMINATION OF THE )  
APPLICATION OF THE FUEL ADJUSTMENT )  
CLAUSE OF DUKE ENERGY KENTUCKY, INC. ) Case No. 2023-0012  
FROM NOVEMBER 1, 2020 THROUGH )  
OCTOBER 31, 2022 )

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**DIRECT TESTIMONY OF**  
**LIBBIE S. MILLER**  
**ON BEHALF OF**  
**DUKE ENERGY KENTUCKY, INC.**

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September 22, 2023

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**I. INTRODUCTION AND PURPOSE**

1 **Q. STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Libbie S. Miller. My business address is 139 East Fourth Street,  
3 Cincinnati, Ohio 45202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by the Duke Energy Business Services LLC (DEBS) as Rates and  
6 Regulatory Strategy Manager for Duke Energy Kentucky, Inc., (Duke Energy  
7 Kentucky or Company) and Duke Energy Ohio, Inc. (Duke Energy Ohio). DEBS  
8 provides various administrative and other services to Duke Energy Kentucky and  
9 other affiliated companies of Duke Energy Corporation (Duke Energy).

10 **Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**  
11 **QUALIFICATIONS.**

12 A. I earned a Bachelor of Science in Accounting from Indiana State University,  
13 Terre Haute, Indiana, in 1988. I also am a Certified Public Accountant licensed in  
14 Indiana. I began my career with Public Service Indiana, in 1988, where I held  
15 positions in Fuels Accounting, Corporate Accounting, and Financial Systems. I  
16 transferred to Cincinnati, Ohio, in 1995 with the inception of Cinergy Corp., the  
17 parent of Duke Energy Ohio, where I continued working in Financial Systems and  
18 later held various accounting positions within the generation business. In 2015, I  
19 worked in Program Performance supporting Energy Efficiency and Demand  
20 Response customer programs for Duke Energy Indiana. In January 2018, I  
21 became Lead Analyst, Rates and Regulatory Strategy for Duke Energy Kentucky

1 and Duke Energy Ohio. In 2022, I assumed my current position as Rates and  
2 Regulatory Strategy Manager.

3 **Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC**  
4 **SERVICE COMMISSION?**

5 A. Yes. I have provided testimony in proceedings before the Kentucky Public  
6 Service Commission regarding Duke Energy Kentucky's Fuel Adjustment Clause  
7 (FAC).

8 **Q. PLEASE DESCRIBE YOUR DUTIES AS RATES AND REGULATORY**  
9 **STRATEGY MANAGER.**

10 A. As Rates and Regulatory Strategy Manager, I am responsible for the preparation of  
11 various monthly, quarterly, and annual rate recovery mechanisms. I also prepare other  
12 schedules used in retail rate filings for Duke Energy Kentucky and Duke Energy Ohio.

13 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

14 A. The purpose of my direct testimony is to respond to Paragraph 4(k) and to sponsor  
15 the calculation of Duke Energy Kentucky's FAC, including the adjustments  
16 during the review period of November 1, 2020 through October 31, 2022 (Review  
17 Period). I support the Company's decision to increase its base fuel rate and the  
18 calculation of the proposed base fuel rate to be set in this proceeding. Finally, I  
19 sponsor several of Duke Energy Kentucky's responses to the Commission's Data  
20 Requests contained in Appendix B of its September 6, 2023 Order (Order).

## **II. DISCUSSION**

### **A. The Company's FAC Calculation**

1 **Q. PLEASE COMMENT GENERALLY ON THE REASONABLENESS OF**  
2 **DUKE ENERGY KENTUCKY'S CALCULATION OF ITS FAC RATE**  
3 **DURING THE REVIEW PERIOD.**

4 A. The monthly FAC rates were prepared by me or under my direction and control  
5 and, to the best of my knowledge, information, and belief, accurately reflect the  
6 Company's actual fuel and economy power costs.

7 **Q. WHAT IS THE COMPANY'S CURRENT BASE FUEL RATE AND WHEN**  
8 **WAS IT LAST MODIFIED.**

9 A. In its August 2, 2021 Order in Case No. 2021-00057, the Company's previous  
10 two-year review, the Commission ordered Duke Energy Kentucky's proposed  
11 base fuel cost of \$0.025401 per kWh be approved.

12 **Q. IN YOUR OPINION WAS THE COMPANY'S BASE FUEL RATE**  
13 **DURING THE REVIEW PERIOD ACCURATE AND REASONABLE?**

14 A. Yes.

15 **Q. WHAT RATE DOES THE COMPANY PROPOSE FOR THE BASE FUEL**  
16 **RATE IN THE UPCOMING TWO-YEAR PERIOD FOR THE FAC?**

17 A. As shown in response to STAFF-DR-01-026, the Company proposes to set its  
18 base fuel rate at 0.033780 \$/kWh, which is an increase of 0.008379 \$/kWh over  
19 its current base fuel rate.

20 **Q. WHAT MONTH IS THE COMPANY USING AS THE BASE PERIOD**  
21 **FOR ITS PROPOSED BASE FUEL RATE?**

1 A. As shown in response to STAFF-DR-01-024, the Company is proposing to use  
2 February 2022 as the month to represent the base period.

3 **Q. WHAT IS YOUR RATIONALE FOR DETERMINING THIS TO BE A**  
4 **REASONABLE LEVEL FOR THE BASE FUEL RATE?**

5 A. During the Company's analysis of the actual fuel rates in the 2-year review  
6 period, 2-year forecasted period, and actuals after the end of the review period,  
7 November 2022 through July 2023, it became apparent that the base fuel rate  
8 should be increased to more accurately reflect today's economic environment.  
9 The base fuel rate the Company is proposing is near both the average and median  
10 of the actual total native fuel rate of the 2-year review period as well as the period  
11 of November 2022 through July 2023.

12 **Q. WHAT ARE THE COMPANY'S 2023 AND 2024 PROJECTED FUEL**  
13 **RATES?**

14 A. The Company's projected average fuel rates for the calendar years 2023 and 2024  
15 are \$0.043008 \$/kWh and \$0.044595 \$/kWh, respectively.

16 **Q. WHY DID THE COMPANY DECIDE TO USE HISTORICAL COSTS**  
17 **RATHER THAN PROJECTED COSTS IN DETERMINING ITS**  
18 **PROPOSED BASE FUEL RATE?**

19 A. The Company has chosen to use historical costs in determining its proposed base  
20 fuel rate because the Company is of the opinion that the historical costs best  
21 represent costs going forward. The Company did analyze the most recent 2023  
22 and 2024 forecast prepared in October 2022, which forecasted a higher base fuel  
23 rate. At the time the forecast was prepared, the economic conditions and outlook

1 of the Company were different than they are today. Ms. Hughes, Mr. McClay and  
2 Mr. Daniel described in their testimonies the changes that occurred in the 2-year  
3 review period and their outlook for the next two years. They also discuss how the  
4 Company tries to mitigate costs for customers. Based on their discussions and the  
5 timing of the forecast, using a historical cost for the future rate is most  
6 appropriate.

7 **Q. IN YOUR OPINION IS THE COMPANY'S PROPOSED BASE FUEL**  
8 **RATE REASONABLE?**

9 A. Yes, the Company's proposed base fuel rate of \$0.033780 \$/kWh based on the  
10 month of February 2022 is reasonable.

11 **Q. PLEASE EXPLAIN HOW THE COMPANY RECORDS COAL**  
12 **CONSUMPTION WHEN ITS EAST BEND GENERATING UNIT IS IN**  
13 **RESERVE SHUTDOWN.**

14 A. Mr. Daniel explains in his direct testimony since a unit is not running during a  
15 reserve shutdown, coal is not consumed. Therefore, coal consumption is not  
16 recorded on the Company's books for a reserve shutdown.

**B. Data Requests and Tariffs Sponsored**

1 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
2 **REQUESTS YOU ARE SPONSORING.**

3 A. I sponsor the Company's responses to Data Request Numbers 13, 15, 19, 20, 23  
4 through 28, 30, 32, 33, 35, and 39 through 41. These responses were prepared by  
5 me and/or under my direction and control and are true and accurate to the best of  
6 my knowledge and belief.

7 **Q. IS DUKE ENERGY KENTUCKY PROVIDING COPIES OF ITS**  
8 **PROPOSED TARIFFS REFLECTING THE CHANGE IN THE BASE**  
9 **FUEL RATE DESCRIBED IN YOUR DIRECT TESTIMONY?**

10 A. Yes. A copy of the Company's proposed tariffs reflecting the proposed change in  
11 the base fuel rate and the resulting change in base rates are included in the  
12 attachment responding to STAFF-DR-01-028. That attachment was prepared at  
13 my request and/or under my direction and control.

**III. CONCLUSION**

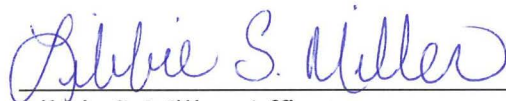
14 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

15 A. Yes.

**VERIFICATION**

STATE OF OHIO                    )  
  )     **SS:**  
COUNTY OF HAMILTON        )

The undersigned, Libbie S. Miller, Rates & Regulatory Strategy Manager, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of her knowledge, information and belief.

  
\_\_\_\_\_  
Libbie S. Miller, Affiant

Subscribed and sworn to before me by Libbie S. Miller, on this 19<sup>TH</sup> day of SEPTEMBER, 2023.



**ADELE M. FRISCH**  
Notary Public, State of Ohio  
My Commission Expires 01-05-2024

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires: 1/5/2024