

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

In the Matter of:

ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL ADJUSTMENT	)	Case No. 2019-00006
CLAUSE OF DUKE ENERGY KENTUCKY,	)	
INC. FROM NOVEMBER 1, 2016 THROUGH	)	
OCTOBER 31, 2018	)	

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**DIRECT TESTIMONY OF**  
**THEODORE H. CZUPIK JR.**  
**ON BEHALF OF**  
**DUKE ENERGY KENTUCKY, INC.**

---

February 25, 2019

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**I. INTRODUCTION AND PURPOSE**

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

2 A. My name is Theodore H. Czupik Jr. and my business address is 139 E. Fourth  
3 Street, Cincinnati, Ohio 45201.

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. DEBS is a service company subsidiary of Duke  
7 Energy Corporation and a non-utility affiliate of Duke Energy Kentucky, Inc.  
8 (Duke Energy Kentucky or Company).

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

11 A. I received a Bachelor of Science degree in Accounting from the University of  
12 Dayton in 1985. I became a Certified Public Accountant (CPA) in the State of  
13 Ohio in 1988.

14 I began my career with The Cincinnati Gas & Electric Company (CG&E)  
15 in 1985 as a Staff Accountant in the Accounting Department. Between 1985 and  
16 1993, I held various positions in the Accounting Department until I transferred to  
17 the Rate Department in 1993. I progressed through various positions until  
18 receiving my current position as Rates & Regulatory Strategy Manager in January  
19 2014.

20 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL AFFILIATIONS.**

21 A. I am a member of the American Institute of Certified Public Accountants and the  
22 Ohio Society of Certified Public Accountants.

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

3 A. Yes. I have testified in several fuel adjustment clause (FAC) proceedings before  
4 the Kentucky Public Service Commission (Commission).

5 **Q. PLEASE SUMMARIZE YOUR DUTIES AS RATES AND REGULATORY**  
6 **STRATEGY MANAGER.**

7 A. As Rates & Regulatory Strategy Manager, my duties include filing various monthly,  
8 quarterly and annual rate recovery mechanisms, preparation of cost of service studies,  
9 and preparation of other schedules used in retail rate filings for Duke Energy Kentucky  
10 and its parent, Duke Energy Ohio, Inc.

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

12 A. The purpose of my direct testimony is to sponsor the calculation of Duke Energy  
13 Kentucky's FAC, including the adjustments during the review period of  
14 November 1, 2016 through October 31, 2018. I support the calculation of the  
15 Company's proposed base fuel rate to be set in this proceeding. Finally, I sponsor  
16 several of Duke Energy Kentucky's responses to the Commission's Data Requests  
17 contained in Appendix B of its February 11, 2019 Order.

## **II. DISCUSSION**

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

18 **Q. PLEASE COMMENT GENERALLY ON THE REASONABLENESS OF**  
19 **DUKE ENERGY KENTUCKY'S CALCULATION OF ITS FAC RATE**  
20 **DURING THE REVIEW PERIOD.**

1 A. In the Commission's July 31, 2017, Order in Case No. 2017-00005, Duke Energy  
2 Kentucky's base rate of recovery for fuel was set at 0.023837 \$/kWh based upon  
3 the Company's October 2016 fuel costs. Duke Energy Kentucky began using the  
4 new base fuel rate in its monthly adjustments to its FAC rate effective with the  
5 September 2017 expense month for rates effective in November 2017 billing  
6 cycle. The monthly adjustments were prepared by me or under my direction and  
7 control and, to the best of my knowledge, information, and belief, accurately  
8 reflected the Company's actual fuel and economy power costs.

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

11 A. Yes.

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

14 A. The Company proposes to set its base fuel rate at 0.023241 \$/kWh. The  
15 calculation is provided in response to STAFF-DR-01-023.

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

18 A. The rate I am proposing for the base fuel rate is the closest actual fuel rate in the  
19 prior twelve months to the Company's projected fuel rate over the next two years.  
20 This judgment is based upon a comparison of the forecasted fuel rate for the  
21 calendar years 2019 and 2020 and the average forecasted fuel rate for the two-year  
22 period of 2019 and 2020 with the actual fuel rates for the prior twelve months.  
23 The projected fuel rate over the next two years is slightly higher than the actual

1 fuel rate for October 2018 as reflected in the Company's response to STAFF-DR-  
2 01-022.

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

5 A. Yes.

**B. Data Requests and Tariffs Sponsored**

6 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
7 **REQUESTS YOU ARE SPONSORING.**

8 A. I sponsor the Company's responses to Data Request Numbers 13, 14, 16, 22, 23,  
9 24, 25, 26, 27, 29, 30, and 31. These responses were prepared by me and/or under  
10 my direction and control and are true and accurate to the best of my knowledge  
11 and belief.

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

15 A. Yes. A copy of the Company's proposed tariffs reflecting the proposed change in  
16 the base fuel rate and the resulting change in base rates are included in the  
17 attachment responding to STAFF-DR-01-027. That attachment was prepared at  
18 my request and/or under my direction and control.

**III. CONCLUSION**

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

20 A. Yes.

**VERIFICATION**

STATE OF OHIO                    )  
  )  
COUNTY OF HAMILTON        )        SS:

The undersigned, Theodore H. Czupik, Jr., Rates & Regulatory Strategy Manager, being duly sworn, deposes and says that he 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.

Theodore H. Czupik Jr.  
Theodore H. Czupik, Jr., Affiant

Subscribed and sworn to before me by Theodore H. Czupik, Jr., on this 25<sup>th</sup> day of February, 2019.



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

Adele M. Frisch  
NOTARY PUBLIC

My Commission Expires: 1/5/2024

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ELECTRONIC EXAMINATION OF THE	)	
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CLAUSE OF DUKE ENERGY KENTUCKY,	)	
INC. FROM NOVEMBER 1, 2016 THROUGH	)	
OCTOBER 31, 2018	)	

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**DIRECT TESTIMONY OF**  
**BRETT PHIPPS**  
**ON BEHALF OF**  
**DUKE ENERGY KENTUCKY, INC.**

---

February 25, 2019



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**I. INTRODUCTION AND PURPOSE**

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

2 A. My name is Brett Phipps and my business address is 526 S. Church 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, Fuel Procurement, by Duke Energy  
6 Progress, Inc., a utility affiliate of Duke Energy Kentucky, Inc. (Duke Energy  
7 Kentucky, or Company).

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

10 A. I am a 1992 graduate of Marshall University with a Bachelor of Science in  
11 Chemistry. I have worked in the energy industry for approximately 25 years. My  
12 career began in the mining industry in 1993 where I held various roles associated  
13 with surface mining operations. I began my employment with Progress Energy in  
14 1999, where I held roles in terminal operations and sales and marketing for the  
15 unregulated business. I transitioned to the regulated business in 2005 where I  
16 worked in various fuels procurement functions and leadership roles. I joined Duke  
17 Energy Corporation (Duke Energy) in July 2012 and am currently Managing  
18 Director, Fuel Procurement. I am a member of the Coal Institute the Lexington  
19 Coal Exchange, Southern Gas Association, American Gas Association and serve  
20 on the Board of Directors of the American Coal Council.

21 **Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC  
22 SERVICE COMMISSION?**

1 A. Yes, I have testified in numerous fuel adjustment clause (FAC) proceedings  
2 before the Kentucky Public Service Commission (Commission).

3 **Q. PLEASE SUMMARIZE YOUR DUTIES AS MANAGING DIRECTOR,**  
4 **FUEL PROCUREMENT.**

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

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

17 A. The purpose of my testimony is to respond to Paragraph 8(a)-(e) of the  
18 Commission's February 11, 2019 Order, to more broadly discuss and support  
19 Duke Energy Kentucky's fuel procurement practices from November 1, 2016  
20 through October 31, 2018. Finally, I sponsor several of Duke Energy Kentucky's  
21 responses to the Commission's Data Requests contained in Appendix B of its  
22 February 11, 2019 Order.

## **II. DISCUSSION**

1   **Q.   PLEASE COMMENT GENERALLY ON THE REASONABLENESS OF**  
2       **DUKE ENERGY KENTUCKY'S FUEL 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 stations at a competitive 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 specific 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 visit each of the Company's contract producers and mining operations  
2 regularly and any potential new spot producers as well, gathering information  
3 which assists in our analysis of spot coal needs. This information, coupled with  
4 constant monitoring of pricing information published in various places (e.g.  
5 industry newsletters, trade publications, regulatory filings, etc.), as well as a close  
6 review of the weekly spot market pricing indices published by brokers and traders  
7 provides a thorough understanding of the various spot and long-term alternatives  
8 for coal supply. Usually, spot coal commitments are made for small quantities of  
9 coal, over short durations, as compared to long-term contracts of greater than one  
10 year.

11 With respect to natural gas, the company maintains supplier agreements to  
12 ensure natural gas can be procured at a competitive market price to meet the needs  
13 of the Company's gas generation fleet. The gas procurement personnel stay  
14 abreast of market trends and prices through real-time market electronic real-time  
15 pricing platforms such as the Intercontinental Exchange (i.e. ICE) real-time price  
16 feeds, information published in trade publications, industry reports, and various  
17 interactions with suppliers and pipelines. As part of natural gas procurement, the  
18 gas personnel review projections of natural gas needed based on projected  
19 generation unit runs before making commitments to purchase natural gas. The  
20 Company's natural gas supply agreements provide the provisions to ensure the  
21 company procures the needed volume of natural gas at the most competitive price  
22 each day.

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

4    A.    During the review period, the Company received approximately 90% of all  
5           contracted coal during the agreed upon delivery schedule. The small amount of  
6           contract delivery shortfalls were spread over several different suppliers and were  
7           caused by typical operational and logistical delays. The Company maintained  
8           adequate inventory levels and a reliable supply of fuel during the review period.

9                   Duke Energy Kentucky does not maintain long term commitments for  
10                  natural gas supply given the burn profile and low capacity factor of the Woodsdale  
11                  natural gas-fired Generating station (Woodsdale), the Company utilizes firm  
12                  delivered spot gas as needed each day from the most cost competitive supplier. In  
13                  the review period, the Company did experience a delivery issue due to pipeline  
14                  constraints or operational flow orders on one day, but did not significantly impact  
15                  operations to the customer.

16                   With respect to natural gas needs, the Company monitors conditions along  
17                  the interstate pipeline that Woodsdale is connected. Duke Energy Kentucky has  
18                  not historically maintained firm transportation on the interstate pipeline that  
19                  supplies Woodsdale because the costs of doing so could not justify having such a  
20                  contract. Procuring delivered gas purchased on a short-term spot basis has been  
21                  sufficient to meet the Company's generating needs at a cost competitive market.  
22                  The Company purchases natural gas from the short-term spot market based upon  
23                  the day-ahead and real-time energy market dispatch awards received through PJM

1 Interconnection LLC (PJM). Duke Energy Kentucky continually monitors the  
2 natural gas markets for pricing and scarcity changes and those changes are  
3 factored into the Company's daily bids into PJM. Duke Energy Kentucky witness  
4 John Swez explains how the Company, (and all PJM members) operates in PJM.

5 **Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S EFFORTS TO**  
6 **ENSURE COAL ADHERENCE TO CONTRACT DELIVERY**  
7 **SCHEDULES DURING THE REVIEW PERIOD.**

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

1 Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S EFFORTS TO  
2 MAINTAIN THE ADEQUACY OF ITS COAL AND NATURAL GAS  
3 SUPPLIES IN LIGHT OF ANY SUPPLIER'S INABILITY OR  
4 UNWILLINGNESS TO MAKE CONTRACT DELIVERIES.

5 A. As mentioned earlier, the Company monitors supplier delivery performance  
6 monthly as part of a strong adherence to contract administration. The Company  
7 also closely monitors actual coal burns, actual coal inventories and projected coal  
8 burns and inventories. If a supplier fails to make contracted deliveries per the  
9 agreed upon schedule, the Company immediately notifies the supplier and  
10 discusses the reasons and nature of the shortfall. Depending upon the nature of  
11 the failure to perform, the parties either agree to reschedule the missed shipments  
12 or the Company enforces the legal terms of the contracts for non-performance.  
13 The Company then factors any shortfall or agreed upon make up schedule for  
14 missed tons into the forward plans for projected inventories. If the missed  
15 shipments will lead to a situation where the Company's coal inventories will fall  
16 below established inventory guidelines, the Company will purchase replacement  
17 coal through its competitive bid process.

18 Similarly, with respect to natural gas procurement, the Company maintains  
19 supplier agreements to ensure natural gas can be procured at a competitive market  
20 price and continually monitors the interstate pipeline that connects to Woodsdale.  
21 During times of operational flow restrictions, the pipeline will provide the  
22 Company with operational information on the pipeline and the Company will



1           communicate with the pipeline operator as needed to stay abreast of operational  
2           conditions.

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

9   A.   Coal markets during the review period and for the foreseeable future continue to  
10       be in a state of change due to a number of factors, including but not limited to: (1)  
11       uncertainty around proposed, imposed, and stayed U.S. Environmental Protection  
12       Agency regulations for power plants; (2) continued abundant natural gas supply  
13       and storage resulting in lower natural gas prices combined with installation of new  
14       combined cycle generation by utilities, which has reduced overall domestic coal  
15       demand; (3) continued changes in demand for global markets for both steam and  
16       metallurgical coal; (4) uncertainty surrounding regulations for mining operations;  
17       and (5) the on-going financial viability of many of the Company's coal suppliers.

18                 With respect to natural gas, the nation's natural gas supply has grown  
19       significantly over the last several years and producers continue to enhance  
20       production techniques to enhance efficiencies and lower production costs. In the  
21       shorter term, natural gas prices are reflective of the dynamics between supply and  
22       demand factors, seasonal weather and overall storage inventory balances. Over the  
23       longer-term planning horizon, gas supply is projected to continue to increase

1 along with the needed pipeline infrastructure to move the growing supply to meet  
2 demand related to power generation, liquefied natural gas exports and pipeline  
3 exports to Mexico.

4 The Company expects to continue to employ similar procurement practices  
5 over the next two years as it has in the past for coal and natural gas. Our practices  
6 have maintained a reliable supply of coal and natural gas at a very competitive  
7 cost for our customers. Practices include the use of staggered terms on long term  
8 contracts, seeking to maintain a diversified mix of suppliers and supply sources,  
9 ensuring the right quality of coal depending on power market conditions, using a  
10 mixture of fixed price contracts and variable price contracts tied to changes in  
11 certain indices as appropriate, enforcement of all contract provisions and  
12 continuing compliance with Company coal contracting coverage guidelines.

13 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
14 **REQUESTS YOU ARE SPONSORING.**

15 A. I sponsor the Company's responses to Data Request Numbers  
16 1,2,3,4,5,6,8,9,10,11,18,19,20,21 in this proceeding. These responses were  
17 prepared by me and under my direction and control and are true and accurate.

**III. CONCLUSION**

1 **Q. IN YOUR OPINION, WERE DUKE ENERGY KENTUCKY'S FUEL**  
2 **COSTS AND PROCUREMENTS DURING THE REVIEW PERIOD**  
3 **REASONABLE?**

4 **A. Yes.**

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

6 **A. Yes.**

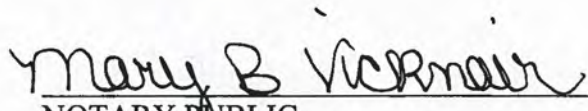
VERIFICATION

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

The undersigned, Brett Phipps, Managing Direct – Fuel Procurement, being duly sworn, deposes and says that he 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.

  
\_\_\_\_\_  
Brett Phipps, Affiant

Subscribed and sworn to before me by Brett Phipps on this 25<sup>th</sup> day of February, 2019.

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

My Commission Expires:

MARY B VICKNAIR  
NOTARY PUBLIC  
Davie County  
North Carolina  
My Commission Expires Sept. 21, 2022

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

In the Matter of:

ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL ADJUSTMENT	)	Case No. 2019-00006
CLAUSE OF DUKE ENERGY KENTUCKY,	)	
INC. FROM NOVEMBER 1, 2016 THROUGH	)	
OCTOBER 31, 2018	)	

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

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February 25, 2019

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**I. INTRODUCTION AND PURPOSE**

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

2 A. My name is John D. Swez and my business address is 526 S. Church 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 Science degree in Mechanical Engineering from Purdue  
11 University in 1992. I received a Master's 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. Though my title has changed on several  
16 occasions, I assumed my current role on January 1, 2006.

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

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

21 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS DIRECTOR,  
22 GENERATION DISPATCH & OPERATIONS.**

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

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

9 A. The purpose of my direct testimony is to respond to the Commission's February  
10 11, 2019 Order and address the changes in the wholesale electric power market  
11 that occurred during the two-year review period of November 1, 2016 through  
12 October 31, 2018, and how those changes have impacted Duke Energy  
13 Kentucky's power procurement practices. In doing so, I describe the Company's  
14 participation in PJM. Finally, I sponsor several of the Company's responses to the  
15 Commission's Data Requests contained in Appendix B of its February 11, 2019  
16 Order.

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

17 **Q. PLEASE GENERALLY DESCRIBE DUKE ENERGY KENTUCKY'S**  
18 **POWER PROCUREMENT PRACTICES.**

19 A. During the entire review period, Duke Energy Kentucky has been a member of  
20 PJM, the nation's first fully functioning RTO that operates the power grid and  
21 wholesale electric market for all or parts of thirteen states and the District of



1 Columbia. As discussed herein and in the Direct Testimony of John A.  
2 Verderame, this electric market consists of energy markets, capacity markets,  
3 ancillary services markets, and a financial transmission rights (FTR) market.  
4 PJM's operation is governed by agreements approved by the Federal Energy  
5 Regulatory Commission (FERC) including the Operating Agreement, Open  
6 Access Transmission Tariff (OATT), and the Reliability Assurance Agreement.  
7 As a member of PJM, Duke Energy Kentucky is subject to these agreements,  
8 which among other things, require Duke Energy Kentucky to offer all of its  
9 available generation to PJM and to purchase its customer energy load from the  
10 PJM Day-Ahead or Real-Time Energy Markets. The Day-Ahead and Real-Time  
11 Energy Markets are collectively referred to as the PJM Energy Market for the  
12 remainder of my testimony.

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

22 During the review period, Duke Energy Kentucky also participated in  
23 PJM's Ancillary Services Markets. Day-Ahead and Real-Time prices for ancillary

1 services appear to be at reasonable price levels consistent with market conditions.  
2 Furthermore, Duke Energy Kentucky's generating units are appropriately  
3 receiving day-ahead and real-time awards for supply of reserves.

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

5 A. PJM administers its Energy Market utilizing locational marginal pricing (LMP).  
6 LMP can be broadly defined as the value of one additional megawatt of energy at  
7 a specific point on the electric grid. In PJM, LMP is composed of three  
8 components; the system energy price, the transmission marginal congestion price,  
9 and the marginal loss price. Both the Day-Ahead and Real-Time Energy Markets  
10 are based on supply offers and demand bids submitted to PJM by market  
11 participants, including both generator owners (as sellers) and load serving entities  
12 (as buyers).

13 The Day-Ahead Energy Market provides a means for market participants  
14 to mitigate their exposure to price risk in the Real-Time Energy Market. The Day-  
15 Ahead Energy Market also provides meaningful information to PJM regarding  
16 expected real-time operating conditions for the next day, which enhances PJM's  
17 ability to ensure reliable operation of the transmission system. The Real-Time  
18 Energy Market functions as a balancing market between generation and load in  
19 real-time. Through the PJM Energy Market and the LMP price signals, PJM  
20 provides a market-based solution to value and thus manage energy production,  
21 transmission congestion, and marginal losses in the PJM region.

1 PJM also operates, and Duke Energy Kentucky participates in, the  
2 Ancillary Services Market. Ancillary services include:

- 3 • Synchronized Reserves, which provide energy during an unexpected  
4 period of need;
- 5 • Non-Synchronized Reserves, which also provide energy during an  
6 unexpected period of need, but which are typically off-line;
- 7 • Regulating Reserves, which are utilized to manage short-term changes  
8 in energy requirements;
- 9 • Day-Ahead Scheduling Reserves, a 30-minute day-ahead reserve  
10 product;
- 11 • Black Start Service, which provides energy to the grid in the event of a  
12 black out condition; and
- 13 • Reactive Supply and Voltage Control, which is produced by capacitors  
14 and generators and absorbed by reactors and other inductive devices.

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

17 In addition to these more physical Energy and Ancillary Services Markets,  
18 PJM offers financial products that can be utilized to hedge exposure to the Energy  
19 Markets. Virtual transactions can hedge risk in the Real-Time Energy Market, and  
20 FTR transactions can hedge exposure to day-ahead congestion costs. FTR  
21 auctions are conducted annually, quarterly, and monthly. FTRs are defined with  
22 source and sink points that entitle and obligate the holder to a stream of revenues

1 or charges based on the hourly day-ahead congestion price differences across the  
2 defined path. Duke Energy Kentucky utilizes FTRs to manage the congestion risk  
3 from its generation stations to its load zone. Virtual transactions clear in the Day-  
4 Ahead Energy Market as virtual generators and loads at specific points on the  
5 grid. Virtual transactions settle based on the difference between the day-ahead  
6 and real-time LMP at the specific node. Duke Energy Kentucky may utilize  
7 virtual transactions to hedge generator performance risk, primarily during start up  
8 or as a potential operational contingency.

9 Other non-PJM operated financial markets that are based on PJM market  
10 settlements exist. Duke Energy Kentucky participates in these financial markets  
11 to hedge Duke Energy Kentucky's customers' exposure to day-ahead and real-  
12 time energy prices when its generation stations are unavailable due to planned  
13 maintenance outages or are not expected to clear the PJM Energy Market in  
14 volumes sufficient to serve native load demands.

15 **Q. PLEASE EXPLAIN HOW PJM DISPATCHES GENERATING**  
16 **RESOURCES TO MEET DEMAND.**

17 **A.** An RTO such as PJM performs a security constrained economic commitment and  
18 least-cost security constrained economic dispatch process that simultaneously  
19 optimizes energy and reserves for all generation in its footprint in determining  
20 which assets to commit and dispatch. This process takes into account the various,  
21 unique challenges faced in reliably and economically supplying power to all load  
22 across its footprint, most significantly aligning the production of energy  
23 simultaneously with the volatility in demand within the capability of the

1 transmission network. PJM must continually act to account for the fact that  
2 customer demand is dynamic in nature, fluctuating over the course of a day, week,  
3 and season, while analyzing factors such as costs and operating characteristics of  
4 generation from different types of units within its entire footprint and expected  
5 and unexpected conditions on the transmission network that affect which  
6 generation units can be used to serve load economically and reliably given the  
7 numerous constraints that must be considered. Because of these challenges,  
8 PJM's dispatch process "is designed to be an optimization process...so that a  
9 reliable supply of electricity at the lowest cost possible under the conditions  
10 prevailing in each dispatch time interval can be delivered."<sup>1</sup>

11           Importantly, PJM's decisions as to which generating units should be  
12 dispatched are not made exclusively based on the individual unit's cost. Although  
13 the price of energy at a generating unit is certainly important, PJM's dispatch  
14 process must take into account a number of factors, including system-wide  
15 reliability, transmission grid congestion and losses, and numerous operational  
16 conditions. PJM has access to complete information regarding the operation of its  
17 Day-Ahead and Real-Time Energy Markets in making the determination to  
18 commit and dispatch a unit. Because of the efficient and informed nature of  
19 PJM's dispatch methodology, a utility's energy purchases in PJM's Day-Ahead  
20 and Real-Time Energy Markets are the most efficient and economic means  
21 available to satisfy customer load. Stated another way, energy acquired by all

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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 load serving entities from PJM is necessarily, and by definition, purchased on an  
2 economic dispatch basis.

3 **Q. PLEASE BRIEFLY EXPLAIN HOW DUKE ENERGY KENTUCKY'S**  
4 **CURRENT GENERATION PORTFOLIO PARTICIPATES AND IS**  
5 **DISPATCHED IN THE DAY-AHEAD AND REAL-TIME ENERGY**  
6 **MARKETS.**

7 A. Under the terms of PJM's Reliability Assurance Agreement, as a fixed resource  
8 requirement (FRR) entity and generation owner in PJM, Duke Energy Kentucky is  
9 under a must-offer requirement to offer all of its generation committed to the FRR  
10 plan into the Day-Ahead Energy Market. The generating units are offered with  
11 designations including: Must Run, Economic, Emergency, Fixed Gen, and  
12 Unavailable. Units offered with a Must Run status will clear the market and are  
13 generally dispatched down or at minimum load during periods when the marginal  
14 cost of the unit is above the LMP solved by the dispatch model, or are dispatched  
15 up or at full load during periods when the marginal cost of the unit is below the  
16 LMP solved by the dispatch model. Economic status units will generally be  
17 committed if their "all in" costs, including startup costs, are economic across the  
18 following day or during periods of the following day. Emergency status units are  
19 committed during an energy emergency event. Fixed Gen units are committed but  
20 intend to remain fixed or otherwise not follow PJM real-time dispatch.  
21 Unavailable status units will not be considered by the commitment and dispatch  
22 model.

1           Each generating unit is offered hourly with a segmented incremental  
2 energy price pair quantity and ancillary service offer curve across the unit's  
3 operational range as well as a start-up cost, no-load cost, and operating  
4 parameters. The hourly offers are based on numerous factors, including but not  
5 limited to, the daily fuel cost, unit efficiency, emissions and variable operations  
6 and maintenance (O&M) costs, maximum and minimum loadings, and plant  
7 output availability and characteristics. Unit status is determined based upon unit  
8 availability, marginal energy costs, expected impact of certain PJM charges and  
9 credits, and anticipated market clearing prices.

10           Day-ahead generation unit offers are submitted to PJM by 11:00 Eastern  
11 Prevailing Time the day prior to energy flow. Generally, by 13:30 Eastern  
12 Prevailing Time that day, following execution of a security constrained unit  
13 commitment model, PJM posts energy and ancillary services awards for the  
14 following day. These awards are financially binding on both Duke Energy  
15 Kentucky and PJM.

16           In real time, Duke Energy Kentucky makes hourly updates to the energy  
17 and ancillary service offers, primarily with respect to unit availability, but also  
18 taking into account the unit's operating parameters. The Duke Energy Kentucky  
19 generation dispatchers follow PJM generation dispatch signal instructions and  
20 relay necessary instructions to the generation stations.

21           It is possible that in real time, despite receiving a day-ahead energy award,  
22 PJM dispatch signals will instruct Duke Energy Kentucky plants to move to  
23 generation loadings other than their Day-Ahead award level. These instructions

1 are based on the Real-Time energy and ancillary services needs of the overall  
2 system as manifested through LMP price signals at the generator bus. If the real-  
3 time LMP is below a unit's marginal cost of energy, PJM will likely reduce  
4 output, or delay or cancel a unit startup. Conversely, if system conditions have  
5 changed from day-ahead model assumptions, PJM may direct a Duke Energy  
6 Kentucky unit to start up even without a Day-Ahead energy award. Duke Energy  
7 Kentucky has an obligation and financial incentive to follow PJM dispatch  
8 instructions.

9 **Q. PLEASE DESCRIBE ANY CHANGES THAT OCCURRED IN THE**  
10 **WHOLESALE ELECTRIC POWER MARKET BETWEEN NOVEMBER**  
11 **1, 2016, AND OCTOBER 31, 2018, THAT SIGNIFICANTLY AFFECTED**  
12 **DUKE ENERGY KENTUCKY'S ELECTRIC POWER PROCUREMENT**  
13 **PRACTICES.**

14 A. Duke Energy Kentucky joined PJM effective January 1, 2012, and thus operated  
15 within PJM during the period under review in this proceeding. Accordingly, the  
16 Company continues to offer its generation and bid its load into the PJM market.  
17 For the Duke Energy Kentucky generating capacity, the Company offered its  
18 resources in an FRR capacity plan. The generating resources that are committed  
19 in the FRR plan have a must-offer obligation for their energy in the Day-Ahead  
20 Energy Market. Duke Energy Kentucky Witness Mr. Verderame discusses the  
21 PJM Capacity markets in greater detail through his direct testimony.

22 East Bend, continues to compete favorably in the PJM market, with typical  
23 dispatch of this unit at full load during on-peak periods and even during much of



1 the off-peak periods as well. The Company's six combustion turbines at  
2 Woodsdale station continue to see limited dispatch within the PJM energy  
3 markets. The Company continued to make economic power purchases for both  
4 planned and unplanned outages during the audit period to mitigate exposure to  
5 market prices. In addition, Duke Energy Kentucky made economic purchases  
6 from PJM when the purchases were more economic than dispatching its own  
7 generation for the benefit of the Company's native load.

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

1 blackstart, and reactive service in a reliable manner for the benefit of customers  
2 and shareholders.

3 **Q. IS DUKE ENERGY KENTUCKY CONTEMPLATING ANY CHANGES**  
4 **TO ITS PARTICIPATION IN THE PJM CAPACITY PLANNING**  
5 **PROCESS?**

6 A. The Company continually evaluates the merits of a potential switch from the FRR  
7 capacity planning process to participate in the Base Residual Auction capacity  
8 planning process. The Company has not made a decision in that regard and is  
9 mindful of its commitment to seek approval from this Commission in advance of  
10 such a change.

11 **Q. PLEASE IDENTIFY THE RESPONSES TO COMMISSION DATA**  
12 **REQUESTS YOU ARE SPONSORING.**

13 A. I sponsor the Company's responses to Data Request Numbers 7, 12, 14, 15, 16,  
14 17, 28, 29, and 32. These responses were prepared by me and under my direction  
15 and control and are true and accurate.

### **III. CONCLUSION**

16 **Q. IN YOUR OPINION, WERE DUKE ENERGY KENTUCKY'S POWER**  
17 **PROCUREMENT PRACTICES REASONABLE DURING THE AUDIT**  
18 **PERIOD?**

19 A. Yes.

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

21 A. Yes.



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

In the Matter of:

ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL	)	Case No. 2019-00006
ADJUSTMENT CLAUSE OF DUKE ENERGY	)	
KENTUCKY, INC. FROM NOVEMBER 1,	)	
2016 THROUGH OCTOBER 31, 2018	)	

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**DIRECT TESTIMONY OF**  
**JOHN A. VERDERAME**  
**ON BEHALF OF**  
**DUKE ENERGY KENTUCKY, INC.**

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February 25, 2019

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## **I. INTRODUCTION**

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

2 A. My name is John A. Verderame, and my business address is 526 S. South Church  
3 Street, Charlotte, North Carolina 28202.

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

5 A. I am employed by Duke Energy Progress, Inc. (Duke Energy Progress) as  
6 Managing Director, Power Trading and Dispatch. Duke Energy Progress is the  
7 utility formerly known as Progress Energy Inc., (Progress Energy) located in  
8 North and South Carolina. As part of the merger integration process, Duke Energy  
9 Progress now provides various administrative and other services to the regulated  
10 affiliated companies within Duke Energy Corporation (Duke Energy Corp.),  
11 including Duke Energy Kentucky, Inc., (Duke Energy Kentucky or the  
12 Company).

13 **Q. PLEASE DESCRIBE BRIEFLY YOUR EDUCATION AND**  
14 **PROFESSIONAL EXPERIENCE.**

15 A. I received a Bachelor of Arts degree in Economics from the University of  
16 Rochester in 1983, and a Masters in Business Administration in Finance from  
17 Rutgers University in 1985. I have worked in the energy industry for 18 years.  
18 Prior to that, from 1986 to 2001, I was a Vice President in the United States (US)  
19 Government Bond Trading Groups at the Chase Manhattan Bank and Cantor  
20 Fitzgerald. My responsibilities as a US Government Securities Trader included  
21 acting as the Firm's market maker in US Government Treasury securities. I joined  
22 Progress Energy, in 2001, as a Real-Time Energy Trader. My responsibilities as a

1 Real-Time Energy Trader included managing the real-time energy position of the  
2 Progress Energy regulated utilities. In 2005, I was promoted to Manager of the  
3 Power Trading group. My role as manager included responsibility for the short-  
4 term capacity and energy position of the Progress Energy regulated utilities in the  
5 Carolinas and Florida.

6 In 2012, upon consummation of the merger between Duke Energy Corp.  
7 and Progress Energy, Progress Energy became Duke Energy Progress and I was  
8 promoted to my current position.

9 **Q. HAVE YOU EVER TESTIFIED BEFORE THE KENTUCKY PUBLIC**  
10 **SERVICE COMMISSION?**

11 A. Yes. I have previously testified in the Company's Fuel Adjustment Clause  
12 proceedings as well as other cases that have involved the Company's participation  
13 in energy and capacity markets.

14 **Q. PLEASE SUMMARIZE YOUR DUTIES AS MANAGING DIRECTOR,**  
15 **POWER TRADING AND DISPATCH.**

16 A. As Managing Director, Power Trading and Dispatch of Duke Energy Progress, I  
17 am responsible for Power Trading and Generation Dispatch on behalf of the  
18 Company's regulated utilities in the Carolinas, Florida, Indiana, Ohio, and  
19 Kentucky. I am primarily responsible for Duke Energy Kentucky's generation  
20 dispatch, unit commitment, 24-hour real-time operations, and plant  
21 communications related to short-term generating maintenance planning. I lead the  
22 team responsible for managing the Company's capacity position with respect to  
23 meeting its Fixed Resource Requirement (FRR) obligation as a member of PJM

1 Interconnection, L.L.C. (PJM), for the submission of the Company's supply offers  
2 and demand bids in PJM's day-ahead and real-time electric energy (collectively  
3 Energy Markets) and ancillary services markets (Ancillary Services Markets), as  
4 well as managing the Company's short-term and long-term supply position to  
5 ensure that the Company has adequate economic resources committed to serve its  
6 retail customers' electricity needs. In that respect, my teams are also responsible  
7 for any financial hedging done to mitigate exposure to short-term energy prices  
8 and congestion risks.

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

10 A. The purpose of my testimony is to respond to the Commission's February 11,  
11 2019 Order and specifically to address changes in the wholesale electric power  
12 market that the Company expects to occur within the next two years that will  
13 significantly affect Duke Energy Kentucky's power procurement practices. In  
14 doing so, I provide an overview of the Company's participation in PJM as it  
15 pertains to the capacity markets and discuss the customer benefits that the  
16 Company's PJM membership provides. I then describe PJM proposals currently  
17 under consideration by PJM and the Federal Energy Regulatory Commission that  
18 will impact both the Company and Duke Energy Kentucky's customers going  
19 forward.

## II. DISCUSSION

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

21 A. PJM's capacity market is called RPM, which is an acronym for Reliability Pricing  
22 Model. The purpose of RPM is to provide a market construct that enables PJM to



1 secure adequate generation resources to meet the reliability needs of the regional  
2 transmission organization (RTO). The RPM construct and the associated rules  
3 regarding how PJM members participate in the PJM capacity market is described  
4 within the PJM Open Access Transmission Tariff (OATT) and Reliability  
5 Assurance Agreement (RAA). The PJM capacity market operates on a planning  
6 period that spans twelve months beginning June 1<sup>st</sup> and ending May 31<sup>st</sup> of each  
7 year (Delivery Year). In PJM, the capacity market structure is intended to provide  
8 transparent forward market signals that support generation and infrastructure  
9 investment. There are two ways for a PJM member to participate in the RPM  
10 capacity structure: 1) through the RPM baseline procurement auctions; or 2) as a  
11 self-supply FRR entity. The baseline procurement auction is called a base residual  
12 auction (BRA). BRAs are conducted three years in advance of the actual Delivery  
13 Year in order to allow bidders to complete construction of projects that clear the  
14 BRA. The PJM capacity market is designed to provide incentives for the  
15 development of generation, demand response, energy efficiency, and transmission  
16 solutions through capacity market payments.

17 Another important component of RPM is that price signals are locational,  
18 and designed to recognize and quantify the geographical value of capacity. PJM  
19 divides the RTO into multiple sub-regions called locational delivery areas (LDA)  
20 in order to model the locational value of generation.

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

22 A. The PJM OATT and RAA specify the obligations and compensation to load  
23 serving entities (LSE) for supplying capacity. The FRR process is an alternative

1 means for a PJM LSE such as Duke Energy Kentucky to satisfy its customer  
2 capacity obligation under the PJM RAA. Under the FRR construct, an LSE must  
3 annually submit a preliminary three-year forward, and a final current year FRR  
4 capacity plan that meets a PJM defined customer capacity obligation (FRR Plan).  
5 The FRR Plan must identify the unit-specific generating or demand response  
6 resources that will be providing the MWs of capacity that will fulfill the LSE's  
7 customer obligation. FRR allows the LSE to match its customer reliability  
8 requirement to its own generation, demand response, energy efficiency and/or  
9 transmission resources, while still being permitted to sell some or all of its excess  
10 supply into RPM. Duke Energy Kentucky would face severe penalties and  
11 limitations on its ability to choose the FRR option if PJM were to deem either its  
12 initial or final FRR plans to be insufficient or its generation otherwise non-  
13 compliant with PJM requirements.

14 Duke Energy Kentucky annually submits both a preliminary and a final  
15 FRR Plan to PJM. This is consistent with the Commission's Order in Case No.  
16 2010-00203 whereby the Commission required the Company to participate in  
17 PJM as an FRR entity until such time as it received Commission approval to  
18 participate in the PJM capacity auctions. To date, Duke Energy Kentucky has not  
19 requested such permission, but will do so if the Company determines that a  
20 change would be in the best interests of its customers and should be made. The  
21 Company continues to evaluate the merits of exiting the FRR and becoming a full  
22 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  
7 Kentucky's customers, as well as the reserve requirement for that load mandated  
8 by PJM. As the FRR plan timeline follows the RPM auction timeline, the  
9 Company will soon have to submit its initial FRR Plan for the delivery period  
10 spanning June 1, 2022 through May 31, 2023, and its final FRR plan for the  
11 delivery period spanning June 1, 2019 through May 31, 2020.

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

15 **Q. HAVE THERE BEEN ANY RECENT AND SIGNIFICANT**  
16 **DEVELOPMENTS WITH RESPECT TO DUKE ENERGY KENTUCKY'S**  
17 **POWER PROCUREMENT PRACTICES AS IT PERTAINS TO ITS**  
18 **OPERATION IN PJM?**

19 A. Yes. Even though Duke Energy Kentucky does not participate directly in the PJM  
20 capacity market, it is impacted by market developments. In the Base Residual  
21 auction for the 2020/2021 Planning year, which was conducted in May of 2017,  
22 the Duke Energy Ohio Kentucky (DEOK) delivery zone separated as a  
23 constrained zone. Duke Energy Kentucky is required to provide capacity in its

1 FRR plans that meet the requirements of the DEOK zone. While the Company's  
2 owned generation at East Bend and Woodsdale stations meet that requirement, if  
3 satisfying upcoming FRR plans required purchases of additional short or long-  
4 term capacity, such capacity would need to meet those same requirements. The  
5 DEOK zone separation impacts market liquidity for capacity; particularly when  
6 combined with retirements of other generation in the zone. While this diminished  
7 liquidity has not impacted Duke Energy Kentucky to date, and the DEOK zone  
8 did not separate in the 2021/2022 Base Residual Auction, the Company is mindful  
9 of the potential impacts on capacity planning.

10 **Q. PLEASE EXPLAIN THE RECENT CHANGES TO THE CAPACITY**  
11 **MARKET CONSTRUCT THAT PJM IMPLEMENTED WITH THE**  
12 **CAPACITY PERFORMANCE CONSTRUCT.**

13 A. In a stated effort to improve the reliability of generating resources in the PJM  
14 footprint, PJM has redesigned the RPM with its "Capacity Performance"  
15 construct. In doing so, PJM redefined its capacity products and implemented new  
16 performance-based penalties. Specifically, PJM established two classes of  
17 capacity, "Capacity Performance" Capacity and for a limited transitional period,  
18 "Base Capacity". Capacity Performance Resources must be capable of sustained,  
19 predictable operation that allows resource to be available to provide energy and  
20 reserves during performance assessment hours throughout the Delivery Year.  
21 Capacity Performance capacity is subject to non-performance charges assessed  
22 during emergency conditions throughout entire Delivery Year. Base Capacity is  
23 only held to the Capacity Performance standard from June through September.

1 Capacity Performance capacity must quite simply be required to be available to  
2 the RTO during periods of high load demand or system emergency, or face  
3 substantial performance penalties. With Capacity Performance, PJM is adopting a  
4 no-excuses policy in order to improve reliability through a new penalty structure.

5 In this new construct, PJM is transitioning all capacity in the footprint to  
6 Capacity Performance by the 2020-2021 Delivery Year. In other words, by June  
7 1, 2020 all capacity purchased on behalf of the load through RPM or eligible for  
8 inclusion in FRR capacity plans must meet the Capacity Performance criteria.

9 **Q. WHEN DID THE CAPACITY PERFORMANCE RULES GO INTO**  
10 **EFFECT?**

11 A. PJM described a transitional period to achieve 100% Capacity Performance over  
12 four years, some years for which it had already conducted the three-year forward  
13 Base Auctions under the old construct. PJM has conducted transitional auctions at  
14 increasing percentages of Capacity Performance for the 2016-2017 Delivery Year  
15 through the 2019-2020 Delivery Years. While generation included in FRR  
16 capacity plans must eventually meet Capacity Performance requirements, and be  
17 exposed to the same non-performance penalties, FRR entities, such as Duke  
18 Energy Kentucky, were exempted from Capacity Performance in the final FERC  
19 order approving Capacity Performance through the 2018-2019 Delivery Year.  
20 Following the transitional percentages applied to the general market, Duke  
21 Energy Kentucky has filed a preliminary FRR plan and will file a final plan for  
22 the 2019-2020 Delivery Year that includes 80% of its obligation as Capacity  
23 Performance capacity. The preliminary FRR plan that Duke Energy Kentucky

1 filed for the 2020/2021 Delivery Year includes 100% Capacity Performance  
2 capacity.

3 **Q. HOW WOULD YOU CLASSIFY THE CURRENT DUKE ENERGY**  
4 **KENTUCKY RESOURCES IN TERMS OF COMPLIANCE WITH THE**  
5 **CAPACITY PERFORMANCE CONSTRUCT?**

6 A. East Bend 2 meets the minimum requirements of a Capacity Performance  
7 resource in that it is a coal fired facility with a significant reserve of fuel stored  
8 on-site. The Woodsdale Combustion Turbine facility will meet the Capacity  
9 Performance requirements with the completion of the construction of its new dual  
10 fuel system. The primary fuel at Woodsdale is natural gas delivered under a non-  
11 firm delivery contract. Due to its low capacity factor, it is not economic to  
12 maintain contracted firm natural gas transportation for the station. While the  
13 Woodsdale Units were historically capable of running on propane as a secondary  
14 fuel, with the closure of the propane storage cavern that was owned by an  
15 unaffiliated third party, the Company was no longer able to rely upon propane as  
16 a viable secondary fuel source. As a result, and in order to meet the capacity  
17 performance requirements, the Company sought and received Commission  
18 authorization to construct a low sulfur diesel fuel system with onsite storage. The  
19 Company expects to complete construction of this system in sufficient time to  
20 meet capacity performance requirements. The Company continues to evaluate  
21 Capacity Performance compliance opportunities for its portfolio to increase their  
22 value and mitigate non-performance risks.

1 Q. PLEASE DESCRIBE ANY CHANGES TO THE WHOLESALE  
2 ELECTRIC POWER MARKET THAT THE COMPANY EXPECTS TO  
3 OCCUR WITHIN THE NEXT TWO YEARS THAT WILL  
4 SIGNIFICANTLY AFFECT DUKE ENERGY KENTUCKY'S POWER  
5 PROCUREMENT PRACTICES.

6 There are several FERC or PJM initiatives under way that have the potential to  
7 impact Duke Energy Kentucky customers directly over the next two years. PJM,  
8 through its stakeholder process, is pursuing a general set of reforms to its energy  
9 and capacity markets. Regarding capacity market reform, FERC has yet to rule  
10 on a PJM filing made in October 2018 relating to the Must Offer Price Rule  
11 (MOPR). The filing addresses concerns that FERC had with an earlier PJM filing  
12 addressing PJM concerns that, under current rules, the bidding behavior of owners  
13 of subsidized generation was having a suppressive effect on PJM capacity market  
14 clearing prices. PJM's current proposal is designed such that subsidized  
15 generation participating the RPM construct clears the capacity market with  
16 associated load but receives no revenue from PJM.

17 For Duke Energy Kentucky, a significant aspect of this proceeding  
18 involves reinstatement of the Self-Supply Exemption to the MOPR. Under the  
19 Self Supply Exemption, vertically integrated entities such as Duke Energy  
20 Kentucky would be exempt from the MOPR. As an FRR entity, Duke Energy  
21 Kentucky resources are not currently impacted by the MOPR as its generation is  
22 not bid into the market; but if it were to decide to move to the RPM construct in  
23 the future, this exemption would be a significant benefit.

1           The energy reform effort is an initiative to improve energy price formation  
2           in PJM markets. A multi-tiered project, PJM is currently focused on improving  
3           the price signal sent to suppliers of energy reserves. The PJM goal is to more  
4           accurately reflect real time system conditions and the cost of operator response  
5           actions in the LMP instead of as out-of-market uplift costs. While consensus has  
6           not been achieved through the stakeholder process, it is likely that the final  
7           proposal will result in higher reserve market prices, and consequently, higher  
8           energy market LMPs. The reserve market price changes are not anticipated to  
9           have a significant effect on Duke Energy Kentucky as it is a relatively balanced  
10          supplier and consumer of reserves; however higher LMP's will impact purchased  
11          power costs and non-native sales margins. Reduced uplift benefits customers by  
12          both reducing costs and increasing visibility and certainty into out-of-market  
13          activities, enabling better price risk hedging.

14          As PJM's generation mix evolves toward higher natural gas and renewable  
15          resource penetration, PJM management is increasing focus on grid resiliency and  
16          fuel security. PJM describes grid resilience as a broad array of low-probability but  
17          high-impact risks across energy generation, transmission, and distribution  
18          systems. Emergent challenges include a rapidly changing fuel mix, stressed fuel  
19          delivery systems, extreme weather conditions, physical security and cyberattacks.  
20          PJM believes that market forces provide the most efficient system of providing  
21          investment signals to ensure a resilient grid; and has stated it will work towards  
22          providing criteria that incent appropriate infrastructure investments. This



1 emerging and ongoing focus by PJM will undoubtedly impact Duke Energy  
2 Kentucky and its customers.

3 **Q. DO YOU BELIEVE THE CHANGES THAT PJM HAS MADE OR**  
4 **PROPOSES ARE HARMFUL TO DUKE ENERGY KENTUCKY OR ITS**  
5 **CUSTOMERS?**

6 A: Duke Energy Kentucky does not believe that, on balance, the currently proposed  
7 changes harm Duke Energy Kentucky or its customers. Duke Energy Kentucky  
8 follows closely and participates fully in the PJM stakeholder process in  
9 consideration of its current market participation as well as potential future  
10 participation. Most PJM initiatives are designed to improve market design and  
11 may require Duke Energy Kentucky to modify operations or make investments  
12 such as the dual fuel system at Woodsdale station. The Company is particularly  
13 mindful of market changes that impact Duke Energy Kentucky's ability to  
14 effectively utilize its generation fleet as a hedge against short term capacity and  
15 energy prices. While not currently a direct impact to Duke Energy Kentucky as an  
16 FRR entity, changes to capacity market attributes such as the MOPR, if they  
17 impact the ability of Duke Energy Kentucky to monetize the value of customer  
18 generation capacity, could potentially expose customers to higher costs.  
19 Expanding the MOPR, or limiting exemptions for vertically integrated utilities,  
20 could significantly impact generation value if units are forced to offer capacity at  
21 prices that do not clear the auctions if Duke Energy Kentucky decides to leave the  
22 FRR construct. The current proposal before FERC preserves the exemption to  
23 MOPR; and as such is beneficial to Duke Energy Kentucky customers.

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

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

### **III. CONCLUSION**

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

14 A. Yes.

