KyPSC Case No. 2021-00245
TABLE OF CONTENTS

VERIFICATION

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

The undersigned, Bruce L. Sailers, Manager Rates & Regulatory Strategy, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Bruce L. Sailers, Affiant

Subscribed and sworn to before me by Bruce L. Sailers, on this 13th day of October, 2021.

NOTARY PUBLIC

My Commission Expires: July 8, 2022

NOTARY PUBLIC STATE OF OHIO

E. MINNA ROLFES-ADKINS
Notary Public, State of Ohio
My Commission Expires
July 8, 2022

VERIFICATION

STATE OF INDIANA)
) **SS:**
COUNTY OF HENDRICKS)

The undersigned, Cecil T. Gurganus, Vice President Midwest Generation, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests and that it is true and correct to the best of his knowledge, information and belief.

Cecil T. Gurganus, Affiant

Subscribed and sworn to before me by Cecil T. Gurganus on this 12th day of October, 2021.

NOTARY PUBLIC

My Commission Expires:

BONNIE JEAN GOVERT
Seal
Notary Public - State of Indiana
Vigo County
My Commission Expires Jan 7, 2024

VERIFICATION

STATE OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

The undersigned, Daniel D. Sympson, Generation & Transmisson Strategy Director, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Daniel D. Sympson, Affiant

Subscribed and sworn to before me by Daniel D. Sympson, on this 22nd day of October, 2021.

NOTARY PUBLIC

My Commission Expires: 06-09-2023

GEOFFREY LEASE
Notary Public - State at Large
Kentucky
My Commission Expires June 09, 2023
Notary ID 623546

VERIFICATION

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

The undersigned, Jeff Gindling, Principal Engineer, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Jeff Gindling, Affiant

Subscribed and sworn to before me by Jeff Gindling, on this 22nd day of October, 2021.

NOTARY PUBLIC

My Commission Expires: July 8, 2022

NOTARY PUBLIC STATE OF OHIO

E. MINNA ROLFES-ADKINS
Notary Public, State of Ohio
My Commission Expires
July 8, 2022

VERIFICATION

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

The undersigned, John D. Swez, Managing Director, Trading and Dispatch, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

John D. Swez, Affiant

Subscribed and sworn to before me by John D. Swez on this 6 day of October, 2021.

Mary B Vicknair
NOTARY PUBLIC

My Commission Expires:

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

VERIFICATION

STATE OF NORTH CAROLINA)
) **SS:**
COUNTY OF ~~MECKLENBURG~~ Lincoln)

The undersigned, Matt Ruscio, Business Development Director, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Matt Ruscio, Affiant

Subscribed and sworn to before me by Matt Ruscio on this 22 day of October, 2021.

Sheila Lemoine
Notary Public
Lincoln County
North Carolina
My Commission Expires 7/21/2024

Sheila Lemoine
NOTARY PUBLIC

My Commission Expires:
July 21, 2024

G.S. § 10B-41 NOTARIAL CERTIFICATE FOR ACKNOWLEDGMENT

Lincoln County, North Carolina

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Matt Ruscio

Date: October 22, 2021

Sheila Lemoine
Notary Public
Lincoln County
North Carolina
My Commission Expires 7/21/2024

Sheila Lemoine
Official Signature of Notary

Sheila Lemoine, Notary Public

My commission expires: July 21, 2024

I signed this notarial certificate on October 22, 2021 according to the emergency video notarization requirements contained in G.S. 10B-25.

Notary Public location during video notarization: Lincoln County
Stated physical location of principal during video notarization: Mecklenburg County

This certificate is attached to a Verification signed by Matt Ruscio on October 22, 2021.

VERIFICATION

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

The undersigned, J. Michael Geers, Manager Environmental Services, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

J. Michael Geers, Affiant

Subscribed and sworn to before me by J. Michael Geers, on this 19th day of OCTOBER, 2021.

NOTARY PUBLIC

My Commission Expires: 06-18-2022

NOTARIAL SEAL STATE OF OHIO

RUTH M. LOCCISANO
Notary Public, State of Ohio
My Commission Expires 06-18-2022

STATE OF NORTH CAROLINA)
) **SS:**
COUNTY OF ~~MECKLENBURG~~ Lincoln)

The undersigned, Scott Park, Director IRP & Analytics-Midwest, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Scott Park, Affiant

Subscribed and sworn to before me by Scott Park on this 11 day of October 2021.

Sheila Lemoine
NOTARY PUBLIC

Sheila Lemoine
Notary Public
Lincoln County
North Carolina
My Commission Expires 7/21/2024

My Commission Expires:

July 21, 2024

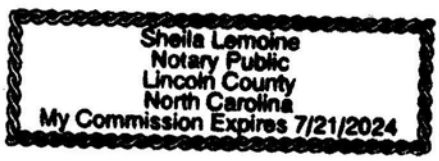
G.S. § 10B-41 NOTARIAL CERTIFICATE FOR ACKNOWLEDGMENT

Lincoln County, North Carolina

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Tim Duff

Date: October 11, 2021

Sheila Lemoine
Official Signature of Notary



Sheila Lemoine, Notary Public

My commission expires: July 21, 2024

I signed this notarial certificate on October 11, 2021 according to the emergency video notarization requirements contained in G.S. 10B-25.

Notary Public location during video notarization: Lincoln County
Stated physical location of principal during video notarization: Mecklenburg County

This certificate is attached to a Verification signed by Scott Park on October 11, 2021.

To VERIFICATION

STATE OF NORTH CAROLINA)
) **SS:**
COUNTY OF ~~MECKLENBURG~~)
Lincoln

The undersigned, Tim Duff, GM Grid Strategy Enablement, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Tim Duff, Affiant

Subscribed and sworn to before me by Tim Duff on this 7th day of October 2021.

Sheila Lemoine
Notary Public
Lincoln County
North Carolina
My Commission Expires 7/21/2024

Sheila Lemoine
NOTARY PUBLIC

My Commission Expires:
July 21, 2024

G.S. § 10B-41 NOTARIAL CERTIFICATE FOR ACKNOWLEDGMENT

Lincoln County, North Carolina

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Tim Duff

Date: October 7, 2021

Sheila Lemoine

Official Signature of Notary

Sheila Lemoine
Notary Public
Lincoln County
North Carolina
My Commission Expires 7/21/2024

Sheila Lemoine, Notary Public

My commission expires: July 21, 2024

I signed this notarial certificate on October 7, 2021 according to the emergency video notarization requirements contained in G.S. 10B-25.

Notary Public location during video notarization: Lincoln County
Stated physical location of principal during video notarization: Union County

This certificate is attached to a Verification signed by Tim Duff on October 7, 2021.

VERIFICATION

STATE OF NORTH CAROLINA)
)
COUNTY OF MECKLENBURG)

SS:

The undersigned, Wendi Fleener, Manager Products & Services, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of her knowledge, information and belief.

Wendi Fleener, Affiant

Subscribed and sworn to before me by Wendi Fleener, on this 6 day of October, 2021.

NOTARY PUBLIC

Sheila Lemoine
Notary Public
Lincoln County
North Carolina
My Commission Expires 7/21/2024

My Commission Expires: July 21, 2024

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-001

REQUEST:

Reference the Integrated Resource Plan (IRP) Executive Summary, p. 4. Regarding the change in the retirement date for the East Bend plant from the 2018 IRP's projected date of 2041 to the current IRP's projected date of 2035:

a. Confirm the following statement from IRP § 6, p. 45: ". . . the economic viability of East Bend 2 may be diminished from two directions – carbon regulation or low gas prices."

b. Confirm that no existing federal regulations mandate a 2035 retirement.

c. Provide the basis for DEK's concern of a fuel supply risk in the next decade.

d. Identify and explain the "other factors that are likely to increase the costs of the plant to customers."

e. Provide a table depicting the amount of stranded costs that would occur due to the premature retirement of the East Bend plant, assuming the retirement occurs during any year for the period 2025-2035.

f. Provide a discussion of the measures DEK will take, or plans to take to mitigate the extent to which its ratepayers will be required to pay for the stranded costs arising from the premature retirement of the East Bend plant. Include in your discussion any federal government programs the Company is tracking that might prove helpful in this regard.

g. Provide a discussion regarding the impact that East Bend's retirement will have on DEK's ability to comply with PJM's mandated minimum reserve margin requirement of 8.7%.

h. Reference IRP § 6, Model Results and Sensitivity Analysis, pp. 42-43. Confirm that:

(i) Under the three different natural gas forecasts referenced on p. 42, ". . . economic retirement of East Bend 2 follows within a few years."[1]

(ii) Under the base gas assumption, the retirement of the East Bend plant is accelerated to 2027.

(iii) Under a low gas environment, East Bend's retirement is accelerated to 2025.

i. Reference IRP Figure 6.3 at IRP p. 48. Confirm that under Transitional Portfolio B, both solar and wind experience a much more rapid build-up such that by 2035 when East Bend retires, the Company acquires 500 MW of solar generation and 470 MW of wind generation.

(i) Reference the following statement at IRP p. 49:

"It was also worth noting that due to the lower capacity factor of renewables, more MWs of generation needed to be added than were retired in order to be able to serve customers with sufficient energy and not be overly reliant on the market. When replacing higher capacity factor, dispatchable generation with lower capacity factor intermittent generation, more MWs need to be added than retired in general."

Given that the Company anticipates solar capacity to be approximately 24%, and wind capacity to be approximately 18%, explain whether this

[1] IRP at pp. 42-43.

means that the Company would have to either build or acquire roughly five (5) times the amounts of solar and wind capacity in order to yield 500 MW of actual solar generation and 470 MW of actual wind generation.

(ii) Based on current average prices for procurement of both solar and wind power generation, provide an approximate estimate of the costs DEK would incur to procure between 1 GW – 5 GW of renewable generation. Explain also if the Company has conducted any studies regarding rate affordability and/or elasticities of demand under such scenarios.

(iii) Reference IRP p. 52. Confirm that for purposes of DEK's modeling of renewable energy prices in the instant IRP:

(1) DEK reduced those prices by 20% in order to reflect "... technological innovation, cost reductions in manufacturing and installation or tax incentives;" and

(2) The factors identified in subpart 1., immediately above, are merely assumptions.

j. Based on all facts and circumstances known today, and recognizing the rapidly changing regulatory environment, provide the year for East Bend's retirement which DEK believes to be most likely.

RESPONSE:

a. This generalization is largely accurate. Put more broadly, the economic viability of East Bend 2 may be diminished by factors that increase the cost of operating the unit, of which carbon regulation might be the most impactful, and by factors that reduce the cost of competing generators, of which low gas prices is potentially the most significant.

b. No existing federal regulations explicitly mandate a 2035 retirement for East Bend 2.

c. The Company anticipates that coal markets over the next decade will continue to see significant coal market volatility due to a number of factors, including: (a) deteriorated financial health of coal suppliers following the past several years of steep declines in coal generation demand resulting from historical low natural gas prices, accelerated coal retirements; (b) natural gas price volatility; (c) renewed uncertainty from the new administration regarding proposed and imposed U.S. Environmental Protection Agency regulations for power plants leading to increased uncertainty around future coal retirements; (d) shorter term procurement terms (e) changing demand in global markets for both steam and metallurgical coal; (f) increasingly stringent safety regulations for mining operations, which result in higher costs and lower productivity; (g) volatile power prices; h) mergers and acquisitions in the different coal basins; (i) tightening access to investor financing coupled with deteriorating credit quality is increasing the overall costs of financing for coal producers; and (j) continued tightening in overall production levels limiting suppliers operational flexibility.

d. Other factors could include capital additions to the plant or other materials that the East Bend 2 needs to continue operating while complying with regulatory requirements.

e. Objection. This request is overly broad, unduly burdensome, and calls for speculation insofar as it asks for an analysis of stranded costs for a retirement that occurs any year between 2025-2035. Any such analysis would have to make assumptions regarding capital additions that could occur over the next 13 years, and

assumptions regarding depreciation rates. The Company has not performed this analysis in the form requested.

f. Objection. Calls for speculation. This request is further objectionable to the extent is seeks a legal opinion or information that is protected under the doctrines of attorney work product and privilege. Without waiving said objections, and to the extent discoverable, the Company will endeavor to propose rate recovery mechanisms and to adjust depreciation rates in future rate proceedings to minimize rate shock to customers.

g. A replacement resource or resources would need to be in place prior to the retirement of East Bend 2 in order to maintain reliability for Duke Energy Kentucky customers and meet the PJM reserve margin requirement.

h. (i) In portfolios optimized for scenarios that include a price on carbon emissions, East Bend 2 is retired by 2035 under all three natural gas price forecasts. Please refer to Figure 6.1 for East Bend retirement years.

(ii) In the portfolio optimized for the scenario that assumes base case gas prices and a price on carbon emissions starting in 2025, East Bend is retired in 2027.

(iii) Figure 6.1 incorrectly shows that shows that East Bend 2 retires in 2025; when in fact the modeling shows that it would retire in 2025 in both low gas scenarios.

i. Under Transitional Portfolio B, by the time East Bend 2 is retired in 2035, the Company has procured 500 MW (nameplate) of solar resources and 470 MW (nameplate) of wind resources.

(i) The 500 MW of solar capacity and 470 MW of wind capacity included in Transitional Portfolio B represent nameplate MW. No additional capacity would need to be procured beyond what is indicated in Figure 6.3 to achieve those totals. The statement that "more MWs need to be added than retired" in reference to Transitional Portfolio B refers to the fact that a combined total of 970 MW of wind and solar resources (plus additional battery and FDR capacity) are required to serve load by 2035 following the retirement of the 600 MW at East Bend.

(ii) The cost of procuring 1-5 GW would be a function of a number of variables such as timing, the size of each facility, the price of natural gas and the power markets, the demand for those resources by others in the industry as well as any potential issues int eh supply chain. The IRP identifies a need for the system, but it is in the CPCN process that the specifics of executing that plan are addressed at a lower level of detail. The forecasted cost of solar and wind still provide the best basis for expected utility costs for adding renewable generation.

(iii)(1) The 20% reduction in capital cost for future solar and wind resources was used to assess the sensitivity of model results (optimized portfolios) to renewable energy cost forecasts. Were such a reduction to occur in reality, it could be driven by a variety of factors including those listed on page 52.

(2) The factors identified in subpart 1 are examples of those that could contribute to future renewables costs falling below the base case forecasts used in this IRP.

j. At the time of this IRP analysis, the Company believes that the most likely retirement year for East Bend 2 is 2035, as indicated in the preferred portfolio (Chapter 7). This expectation will be updated in future IRP analyses.

PERSON RESPONSIBLE: Scott Park
Legal as to objections.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-002

REQUEST:

Reference IRP § 6, p. 49, discussing the four strategies for replacement of East Bend.

a. Regarding strategy one (conversion of East Bend to gas-firing), explain why: (i) the variable costs of such a unit would be higher; and (ii) why the gas-fired unit's capacity factor would be reduced. Confirm the following statement from IRP § 6, p. 45: ". . . the economic viability of East Bend 2 may be diminished from two directions – carbon regulation or low gas prices."

RESPONSE:

a. (i) The variable production cost goes up because the price of natural gas is higher than the price of coal over the long term.

(ii) With a higher variable production cost, the unit would not be expected to dispatch as much into the PJM energy market, all else the same, hence the capacity factor would be expected to go down.

(iii) Confirm. With carbon regulations (i.e., a price on carbon that is included in the production cost), the variable production cost of the unit would go up, again challenging the unit's dispatch position in the PJM energy market. Similarly, to the extent PJM energy prices are generally correlated to natural gas prices, low natural gas prices would generally lower the PJM market energy price, again challenging the unit's dispatch position in the PJM energy market all else the same.

PERSON RESPONSIBLE: John Swez

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-003

REQUEST:

Reference IRP Appendix D, p. 141, wherein it is stated: "Ongoing implementation of the Ozone NAAQS and the non-attainment status of the Cincinnati area may lead to additional reductions in NO_x emission allocations and/or imposition of short-term emission rate limits, potentially eventually necessitating the need for an SCR performance upgrade."

a. Provide the latest developments regarding whether: (i) the Cincinnati area has been found to be in non-attainment status; and (ii) reductions in NOx emission allocations and/or imposition of short-term emission rate limits will be imposed.

b. Provide a cost estimate for the SCR performance upgrade, and describe how this cost was incorporated and utilized into DEK's modeling used in the instant IRP.

c. Provide an estimate for when the SCR upgrade would have to be completed, and describe the nature of the work that would be involved.

d. Explain whether the potential SCR upgrade could affect the projected retirement date of East Bend, and if so how, and under what scenarios.

RESPONSE:

a. Please see response to STAFF-DR-01-049.

b. The current estimated, high-level, cost is less than $500,000. A detailed budget has not been prepared at this time as the need for the project is still uncertain. Controls upgrades, NOx monitor reliability, etc. could possibly be budgeted and planned and perhaps contribute to the conceptual scope.

c. The estimated in service date is in 2022.

d. Given the current estimated costs is less than $1 million, there is no anticipated impact to East Bend's retirement date.

PERSON RESPONSIBLE: Michael Geers – a.
Daniel Sympson – b., c., d.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-004

REQUEST:

In light of the recent and on-going major price increases in natural gas, explain how much credibility should be given to any scenario based on low natural prices.

RESPONSE:

The IRP considers a planning period extending through 2035. At this time, it is unclear for how long current natural gas market conditions will persist. Given the uncertainty around natural gas prices in future years, as well as the significance of natural gas prices in determining optimal portfolio composition, it is prudent to consider a range of forecasts in long-term planning, including both high and low natural gas price forecasts.

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-005

REQUEST:

Regarding pricing for solar generation:

a. Confirm that the Biden Administration is continuing in place U.S. trade sanctions in the form of a Withhold Release Order ("WRO") against certain China-based manufacturers of metallurgical-grade silicon ("MGS") wafers utilized in the manufacturing of solar generation panels.[1]

b. Confirm that most solar panels today are manufactured in China utilizing MGS wafers.

c. Confirm that the Administration is considering expanding these sanctions to apply to other manufacturers utilizing Chinese-manufactured MGS wafers, whose facilities are located in certain other countries.

d. Confirm that these trade sanctions are leading to world-wide supply shortages, and further, that as a result prices for solar panels are increasing significantly.

e. Explain whether DEK's price analyses pertaining to solar generation (whether company-owned or third-party owned) addressed the rising prices for solar panels, and if so: (i) where in the IRP these analyses occurred; (ii) how the price increases were taken into consideration; and (iii) whether the analyses in any manner affected any decisions regarding future portfolio choices, and if so, how.

[1] *See, e.g.* https://www.cnn.com/2021/06/24/politics/solar-materials-china-forced-labor/index.html ; and the *SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight,™ "Solar Market Insight Report 2021 Q3," accessible at:* https://www.seia.org/research-resources/solar-market-insight-report-2021-q3

f. Explain also whether DEK's price analyses pertaining to solar generation (whether company-owned or third-party owned) included cadmium telluride solar technology (sometimes referred to as "thin film" solar cells) within its analyses, as an alternative to MGS.

g. Reference Figure 4.1 at IRP p. 35, wherein it is stated that, "capital costs for solar PV and battery technologies are forecast to continue to decline for ten years before beginning to increase." Explain whether the sources for the solar PV capital costs took into consideration the current U.S. Government trade dispute with China referenced in the prior subparts of the instant question.

RESPONSE:

a. Objection. Calls for speculation. The Company cannot confirm, nor is it aware of, the Biden Administration's plans for future US Trade Policy.

b. Objection. Calls for speculation. The Company cannot confirm that most solar panels are manufactured in China today utilizing MGS wafers. The Company is not aware of what panels are used by countries across the globe.

c. Objection, calls for speculation. The Company cannot confirm, nor is it aware of, the Biden Administration's plans for future US Trade Policy.

d. Objection. Calls for speculation. The Company cannot confirm whether there are world-wide supply shortages or not, nor can we confirm the impact trade policies specifically have on solar panel prices.

e. Our solar pricing incorporates recent market trends and other pertinent information to determine the best estimate for the installation of solar energy. Additionally, we benchmark our pricing against internal information from our supply chain group to ensure the IRP panel prices align with recent data they've seen. Specific to recent

supply chain constraints and inflation, the spring 2021 data did not yet include substantial increases to solar prices due to the recent increases in material prices. There was not yet sufficient market data in the spring to that showed an increased solar price, so the spring IRP solar prices are lower than the expected solar pricing moving forward but was based on the best information available at the time.

(i) Solar equipment market conditions are considered in the development of the capital cost forecasts used in the IRP, which occurs prior to the preparation of the IRP itself.

(ii) Please refer to IRP pages 15-17 for a discussion of the capital cost forecasts and planning models used in the IRP analysis.

(iii) Forecasts for the costs of future solar resources were a key input into the IRP analysis, and were used in the development of all resource portfolios considered in the IRP.

f. The third party engineering study that is performed for our solar costs reviews all panel types that are currently being installed across the United States and determines an aggregate solar panel price based on a weighting system of those modules. We've worked with the company that performs the third party engineering analysis of solar costs to refine the modules considered based on panels typically selected at actual Duke Energy projects to ensure the costs in the model have the proper weighting of panel types from recent Duke Energy experience. The company that performs the third party engineering analysis does consider cadmium telluride technology when determining the expected module price.

g. Duke Energy considered all information that was available during the preparation of the solar price projections included in the Duke Energy Kentucky IRP which

informed the statement referenced in the data request. The spring solar data that was compiled projected declining price of solar due to continued technological learnings that have been experienced for many years. Any subsequent impacts of trade policies, supply chain constraints, and increasing demand beyond what was assumed at the time the projections were developed were not included in the 2021 Duke Energy Kentucky IRP.

PERSON RESPONSIBLE: Scott Park
Legal as to objections.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-006

REQUEST:

Confirm that in Figure 4.1 at IRP p. 35, the typical solar PV (single-axis tracking) capacity factor identified in the IRP is 24%.

a. Provide the solar PV capacity factor DEK anticipates receiving from any company-owned solar facilities or purchased power agreements (PPAs) from non-owned solar facilities located within or near to the Commonwealth of Kentucky.

RESPONSE:

That is correct – the capacity factor for solar in the Duke Energy Kentucky IRP is 24%.

a. We anticipate the capacity factor for solar in Duke Energy Kentucky to be 24%. This capacity factor is consistent with the Company's solar projections for Duke Energy's other jurisdictions in the region.

PERSON RESPONSIBLE: David N. Pitts

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-007

REQUEST:

Provide a discussion regarding what treatment DEK provided to the issue of Renewable Energy Credits (RECs) in the instant IRP. Include in your discussion, at a minimum: (i) how RECs were incorporated into the IRP's price analyses and projections; (ii) whether the full value of RECs will inure to the benefit of ratepayers or shareholders, or whether DEK anticipates a sharing of RECs between both ratepayers and shareholders; and (iii) whether DEK's treatment of RECs will be identical for both company self-build / self-owned projects, or renewable energy PPAs.

RESPONSE:

The issue of renewable energy credits was not addressed in this IRP.

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-008

REQUEST:

Provide a discussion regarding the measures DEK will take to protect ratepayers and landowners from environmental liabilities arising from the decommissioning of solar facilities. Include in your discussion the following:

a. Confirm that the average projected life span of a solar PV system is 20 years.

b. Which parties (e.g., ratepayers, taxpayers, shareholders, project owners, landowners) will be responsible for paying costs of environmental contingencies and tail liabilities in the case of both company-owned facilities, and solar generation procured via PPAs.

c. Explain whether any parties involved in solar developments are required to maintain sureties for decommissioning costs, and if so: (i) the amounts of such sureties; (ii) for how long a period of time, including whether the sureties extend beyond the projected lifespan of a project to cover tail liabilities.

d. Explain what will happen to solar panels once a facility is decommissioned, including whether panels will be recycled, or placed into landfills. If the latter, explain if the landfills will be located in Kentucky.

e. Provide the average cost to both recycle a solar panel, and to dispose of it in a landfill. Explain what party(ies) will pay for those costs, and whether those costs are factored into DEK's cost estimates for the price of solar power utilized in the instant IRP.

f. How DEK will factor and compute terminal net salvage into costs for solar generation facilities, and whether such costs are included in DEK's cost estimates utilized in the instant IRP.

g. Provide the average number of acres needed to generate 1 MW of solar-PV generated power.

h. The ramifications of decreased vegetation growth on land with solar PV panels, including decreased carbon sink potential, water runoff, and land erosion and subsidence.

RESPONSE:

a. The average projected life span of a solar PV system is 30 years.

b. Within the IRP planning models, and specifically on a project by project basis, cost estimates are included regarding the obligations to landowners or the Authority Having Jurisdiction (AHJ) to decommission an asset, similar to other Duke Energy Kentucky owned generating units. With respect to Power Purchase Agreements (PPAs), Duke Energy Kentucky would be buying the energy from the generating unit and carrying the cost for such energy as contracted. Under this circumstance, Duke Energy Kentucky would not hold the obligation to decommission the project.

c. Requirements on assurances for decommissioning costs are typically determined by the Authority Having Jurisdiction (AHJ) or may be negotiated by the landowner in a lease agreement. Typical assurances may be in the form of a surety bond, cash deposit, or letter of credit, and reflect all or a percentage of estimated decommissioning costs. Additional requirements may include costs that are to be updated periodically throughout the life of the solar PV system.

d. At the time of decommissioning, solar panels may be reused or repurposed if functional. Otherwise, solar panel components are recycled, and remaining components are safely disposed of into landfills. The location of such landfills may include Kentucky.

e. An independently verified model determines the total cost for decommissioning, including cost to recycle solar panels. These costs are included in the overall Duke Energy Kentucky cost to operate, maintain and decommission a solar project.

f. An independently verified model determines the total cost for decommissioning (labor, equipment, hauling, etc.), including values to reuse, recycle, or of sold material. These variables, among others, determine the net decommissioning costs for a project. These models are updated periodically during the life of the project to reflect market changes. These costs are included in the overall Duke Energy Kentucky cost to operate, maintain and decommission a solar project.

g. Approximately seven (7) acres to generate one megawatts. This can vary depending on terrain, usable area, and other site constraints.

h. Solar PV systems are designed to comply with and obtain all required environmental and stormwater permits. Development of these arrays include careful consideration for Vegetation Management Plans, including plantings and maintenance of a mixture of native cool and warm season grasses, and forbs (i.e. native wildflowers), intended to decrease water runoff, land erosion and subsidence, and mitigate carbon sink potential. The plantings help to build ground covers, increasing water infiltration rates, reducing topsoil and nutrient runoff in the long term. Pending the land use before construction of a solar array, a solar Vegetation Management Plan should enhance and build soil health and improve

surface and subsurface stormwater drainage. The use of Vegetative Management Plans, and zero-carbon nature of solar power, will provide increased carbon sequestration potential, improving overall carbon sink.

PERSON RESPONSIBLE: Matt Ruscio

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-009

REQUEST:

Confirm that in Figure 4.1 at IRP p. 35, the typical capacity factor for wind generation is identified as 18%.

a. Provide the wind capacity factor DEK anticipates to receive from any company-owned wind generation facilities, or PPAs from non-owned wind generation facilities located within or near to the Commonwealth of Kentucky.

b. Provide the average wind capacity factor in: (i) Kentucky; (ii) northeast Kentucky, if known; (iii) DEK's service territory, if known; (iv) DEO's service territory; (v) DEI's service territory; and (vi) the PJM footprint. Provide a cost estimate for the SCR performance upgrade, and describe how this cost was incorporated and utilized into DEK's modeling used in the instant IRP.

RESPONSE:

a. While the actual capacity factor of wind resources that the Company may procure in the future will depend on a variety of resource-specific variables, an appropriate generic assumption for use in this IRP analysis is 18%.

b. Objection. This request is overbroad, unduly burdensome, and seeks information that is irrelevant to Duke Energy Kentucky insofar as it seeks information regarding affiliate service territories. Moreover, the request seeks information that is not maintained or calculated by the Company. Without waiving said objections, and to the extent discoverable, the average wind capacity factor for Duke Energy

Kentucky, Northeast Kentucky, and Duke Energy Ohio is 18% as these are calculated collectively due to their relatively close/overlapping proximities and region similarities. The Duke Energy Indiana average wind capacity factor is 23%. The Company does not calculate the average wind capacity factors for Kentucky or PJM and did not perform this analysis. Regarding the SCR upgrade, see response to AG-DR-01-03.

PERSON RESPONSIBLE: Scott Park
Legal as to objection.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-010

REQUEST:

Reference IRP Executive Summary, p. 8, wherein the Company states that its future generation projects will exhibit: ". . . a preference for siting resources within the Duke Energy Kentucky service territory, understanding, however, that other locations may be appropriate." Regarding DEK's projected purchases of wind power, confirm that based on data from the National Renewable Energy Laboratory, onshore capacity factor in most eastern states is below 30%.[1] Confirm further that:

a. Only two small areas of Kentucky are capable of supporting wind generation at capacity factors in the range of 25% - 30%.[2]

b. As of 2019, only one wind generation facility was located anywhere near Kentucky, in this case a 27 MW facility located near the Kentucky-Tennessee border, having a 16.1% capacity factor.[3]

c. The next closest facility was located in central West Virginia, a 100 MW facility with a 26.2% capacity factor.[4]

[1] *See*, "Development of Eastern Regional Wind Resource and Wind Plant Output Datasets," National Renewable Energy Laboratory, Subcontract Report NREL/SR-550-46764 (Dec. 2009), p. 14, accessible at: https://www.nrel.gov/docs/fy10osti/46764.pdf . Moreover, for capacity planning purposes, PJM ascribes wind resources a capacity credit of only 12.3% of nameplate. IRP, p. 124 (*citing* PJM "Effective Load Carrying Capability Analysis for Wind and Solar Resources," Feb. 7, 2019).
[2] Id. at p. 16.
[3] "U.S. Wind Energy Performance (Capacity Factors) in 2019, https://emp.lbl.gov/wind-power-performance.
[4] Id.

d. According to the U.S. Energy Information Administration, onshore wind generation will remain economically unattractive until 2040,[5] and will remain miniscule for the Southeast region (which includes Kentucky) through 2050.[6]

RESPONSE:

a. The cited map is a visual representation of regions which had available data for wind resource via an existing project, or meteorological tower. It is not exclusive.

b. The cited map identifies a single 27 MW facility located in Tennessee and was placed in service in 2004. As of 2021, technology has dramatically advanced, increasing hub heights and blade lengths. Duke Energy estimates wind projects in Kentucky with modern technology could achieve capacity factors of 30% or higher.

c. The cited map identifies a 100 MW facility located in central West Virginia with a 2020 capacity factor of 31.6%. The project was placed in service in 2010.

d. As the price of wind turbines continue to decline and technology advances that further increase capacity factors, wind power will continue to be evaluated for future generating projects. As is referenced in the IRP Executive Summary, p. 8, siting resources in locations outside of the service territory may be appropriate, but Duke Energy Kentucky will continue to have a preference for siting resources within the its service territory.

PERSON RESPONSIBLE: Matt Ruscio

[5]USEIA, "Annual Energy Outlook 2020," p. 39, slide 77 (Jan. 29, 2020), accessible at: https://www.eia.gov/outlooks/aeo/pdf/aeo2020.pdf

[6] Id. at p. 40, slide 79.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-011

REQUEST:

Provide the average lifespan of a wind generation turbine.

RESPONSE:

The average projected lifespan of a wind generation turbine is 30 years.

PERSON RESPONSIBLE: Matt Ruscio

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-012

REQUEST:

Provide a discussion regarding the measures DEK will take to protect ratepayers and landowners from environmental liabilities arising from the decommissioning of wind generation facilities. Include in your discussion the following:

a. What parties (e.g., ratepayers, taxpayers, shareholders, project owners, landowners) will be responsible for paying costs of environmental contingencies and/or other tail liabilities in the case of both company-owned facilities, and wind generation procured via PPAs.

b. Explain whether any parties involved in wind generation developments are required to maintain sureties for decommissioning costs, and if so: (i) the amounts of such sureties; (ii) for how long a period of time, including whether the sureties extend beyond the projected lifespan of a project to cover tail liabilities.

c. Explain what will happen to wind turbine blades, and the actual wind turbines themselves once a facility is decommissioned, including whether blades will be recycled, or placed into landfills. If the latter, explain if the landfills will be located in Kentucky.

d. Provide the average cost to both recycle a wind turbine blade, and to dispose of it in a landfill. Explain which party(ies) will pay for those costs, and whether those costs are factored into DEK's cost estimates for the price of solar power, and how those costs are factored into base rates.

e. How DEK will factor and compute terminal net salvage into costs for wind generation facilities.

f. Provide the average number of acres needed to generate 1 MW of wind-generated power.

g. The ramifications of migratory bird deaths, including which parties will pay the costs of any fines levied by state or federal authorities for such deaths. If ratepayers are responsible for paying the costs of any such fines, explain how these costs are factored into both base rates, and costs for wind power utilized in the instant IRP.

RESPONSE:

a. Within the IRP planning models, and specifically on a project by project basis, cost estimates are included regarding the obligations to landowners or the Authority Having Jurisdiction (AHJ) to decommission an asset, similar to other Duke Energy Kentucky owned generating units. With respect to Power Purchase Agreements (PPAs), Duke Energy Kentucky would be buying the energy from the generating unit and carrying the cost for such energy as contracted. Under this circumstance, Duke Energy Kentucky would not hold the obligation to decommission the project.

b. Requirements on assurances for decommissioning costs are typically determined by the Authority Having Jurisdiction (AHJ) or may be negotiated by the landowner in a lease agreement. Typical assurances may be in the form of a surety bond, cash deposit, or letter of credit, and reflect all or a percentage of estimated decommissioning costs. Additional requirements may include updating estimates periodically throughout the life of the solar PV system, or set a schedule to the percentage of the security.

c. At the time of decommissioning, wind turbines may be reused or repurposed if functional. Otherwise, turbine components are recycled, and remaining components are safely disposed of into landfills. The location of such landfills may include Kentucky.

d. An independently verified model determines the total cost for decommissioning, including cost to recycle wind turbines. These costs are included in the overall Duke Energy Kentucky cost to operate, maintain and decommission a solar project.

e. An independently verified model determines the total cost for decommissioning (labor, equipment, hauling, etc.), including values to reuse, recycle or sell material. These variables, among others, determine the net decommissioning costs for a project. These models are updated periodically during the life of the project to reflect market changes. These costs are included in the overall Duke Energy Kentucky cost to operate, maintain and decommission a wind project.

f. Approximately forty (40) acres to generate 1 megawatt. This can vary depending on terrain, usable area, and other site constraints.

g. Wind facilities comply with all applicable migratory bird regulations. All wind projects located in Kentucky are required to adhere to the 2021 U.S. Fish & Wildlife Service (USFWS) Wind Energy Land Based Guidelines. In addition, such projects will develop a Bird & Bat Conservation Strategy and comply with any new applicable migratory bird regulatory guidance programs throughout the lifespan of the facility.

PERSON RESPONSIBLE: Matt Ruscio

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-013

REQUEST:

Reference Figure 1.2. Confirm that due to the projected retirement of the East Bend coal plant in 2035, the Woodsdale CT units will be used on a more frequent basis.

a. If so confirmed, confirm further whether such increased usage will reduce the remaining useful lives of the Woodsdale units, and if so, by how much.

b. Discuss whether the usage of the Woodsdale units by 2035 would become baseload, intermediate, or whether they would continue to operate as peaking units.

c. Provide the current projected retirement date of the Woodsdale units.

RESPONSE:

It is not anticipated at this time that the retirement of East Bend 2, as contemplated as part of the preferred IRP portfolio, would necessarily result in more frequent usage of the Woodsdale CT units.

a. N/A

b. At this time it is anticipated that the Woodsdale CT units will remain a peaking resource throughout the IRP planning period.

c. There is no identified operational retirement date for Woodsdale at the current time. The depreciation retirement date is 2032, (40-year expected life).

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-014

REQUEST:

Reference IRP Figure 1.4 at p. 6. Confirm that based on the DEK Preferred IRP plan as depicted in Figure 1.2 ("Summary of the 2021 DEK IRP"), in the time period from late 2022 to 2024, the projected additions of solar, storage and wind capacity will cause DEK's customer rates to grow from an initial decrease of -1% in 2022 to an increase of +3% by 2024, equating to a growth rate of 400%. Answer the following subparts assuming the scenario depicted Figure 1.2 is eventually implemented:

a. If so confirmed, provide all studies examining projected elasticities of demand on the DEK system over the same time frames.

b. Confirm further that the rate increases graphically depicted in Figure 1.4 for the DEK Preferred Plan will be in addition to other factors causing rates to increase (i.e., O&M, etc.).

c. Provide a detailed discussion providing all reasons why DEK believes that under the DEK Preferred Plan the growth rate in rates will decrease from approximately +3% in 2024 to approximately 0% by 2025.

d. Explain whether DEK has shared this information with: (i) the Governor's Office; (ii) regional chambers of commerce; (iii) Northern Kentucky Community Action Commission; and (iv) the Kentucky Industrial Utility Customers (KIUC).

e. Discuss whether Duke Energy, Ohio (DEO), and/or Duke Energy, Indiana (DEI) are projected to experience similar rate increases.

f. Provide all studies examining elasticities of demand on the DEO and DEI systems over the same time frames.

g. Explain whether Duke Energy Midwest has examined and/or studied the concept of sharing generation sources / facilities among the three operating companies. If so, provide all studies regarding same.

h. Explain how the projected growth rate in DEK's rates of 400% will comport with the principle of gradualism.

i. Provide a discussion regarding any and all transmission system improvements DEK would have to undertake in order to wheel the renewable generation out- put depicted in the IRP into its service territory. Include in your discussion whether the costs of such transmission improvements have been included in the cost analyses utilized in the current IRP, and if so, how and where they were included.

j. Provide a discussion regarding any and all transmission system constraints DEK would encounter in order to wheel the renewable generation sources depicted in the IRP into its service territory. Include in your discussion whether the costs of such transmission constraints have been included in the cost analyses utilized in the current IRP, and if so, how and where they were included.

k. Provide a discussion regarding any and all transmission interconnections DEK would have to undertake in order to wheel the renewable generation sources depicted in the IRP into its service territory. Include in your discussion whether the costs of such transmission constraints have been included in the cost analyses utilized in the current IRP, and if so, how and where they were included.

RESPONSE:

The chart in Figure 1.4 depicts forecasted year-over-year rate impacts resulting from changes to the resource mix as contemplated in the portfolios shown. Rate impacts from other areas of the business (maintaining the distribution system, for example) are not included in this calculation.

The rate impacts indicated in Figure 1.4 for the 2021 IRP Portfolio include impacts from both capital investment and system operation. The calculations shown in the figure incorporate the base case forecast for natural gas prices and assume that no price is imposed on carbon emissions.

In the case of the rate impacts shown for the 2021 IRP Portfolio, the figure indicates a 1.1% decline from 2021 to 2022, a 0.3% increase from 2022 to 2023, and a 2.9% increase from 2023 to 2024, for a total increase of approximately 2.2% from 2021 to 2024. These changes are driven by investment in new resources, operations and maintenance of existing resources, and changes in electricity sales volume relative to total cost.

a. The Company has not performed this analysis and is not aware of any such analysis.
b. The rate increases in Figure 1.4 are due to a combination of factors related to generation such as capital, Fixed and Variable O&M as well as fuel.
c. The rate increase in 2024 is due to a major outage at the East Bend 2 station. These types of outages are part of the normal course of operating a pulverized coal station and are necessary to continue safe and reliable operation of the unit.
d. Objection. This request is vague and ambiguous and subject to interpretation as to what is meant by “this information” and thus calls for speculation. Without waiving said objection and to the extent discoverable, assuming the request is only referring to Figure 1.2, the Company has not met individually with any of the parties

enumerated to discuss Figure 1.2. The Company does not know if any of the parties enumerated have reviewed the Company's IRP since it was filed.

e. Objection. This request is overbroad and unduly burdensome and seeks information that is irrelevant to the case is it seeks information related to affiliates of Duke Energy Kentucky that are not jurisdictional to this Commission. Without waiving said objection, and to the extent discoverable, the Change in Policy portfolio is specific to the Duke Energy Kentucky system and the conditions in which it operates. Comparison to Duke Energy utilities in other states with different market structures, policy regimes, and system characteristics is not possible.

f. The Company has not performed this analysis and is not aware of any such analysis.

g. Objection. This question seeks information that is protected under the doctrines of attorney work product and privilege. Without waiving said objection, and to the extent discoverable, the Company has Company has not performed this analysis.

h. The projected rate impacts associated with the 2021 IRP Portfolio reflect the prudent least cost plan for maintaining reliable electric service for Duke Energy Kentucky customers while mitigating future risks.

i. All generation depicted in IRP would follow the PJM process. Any transmission system improvements would be site specific and be identified through PJM process.

j. All generation depicted in IRP would follow the PJM process. Any transmission system constraints would be site specific and be identified through PJM process.

k. All generation depicted in IRP would follow the PJM process. Any additional transmission system interconnections would be site specific and be identified through PJM process.

PERSON RESPONSIBLE: Benjamin W. Passty – a., f.

Scott Park – b., c., g., h.
Jeff Gindling – i., j., k.
Legal as to objections.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-015

REQUEST:

Reference IRP Figure 1.4 at p. 6. Confirm that based on the "Change in Policy Portfolio" scenario as depicted in Figure 1.3, the projected additions to solar, storage and wind capacity are much more substantial than the DEK Preferred Plan, as depicted in Figure 1.2.

Answer the following subparts assuming the scenario depicted Figure 1.3 is eventually implemented:

a. Confirm also that in the time period from late 2023 to 2024, the projected additions to solar, storage and wind capacity will cause DEK's customer rates to grow from an initial increase of approximately 0.5% in 2022 to approximately 5.5% by 2024, equating to a growth rate of 1,000%.

b. Provide a detailed discussion providing all reasons why DEK believes that under the "Change in Policy Portfolio," the growth rate in rates will decrease from approximately +5.5% in 2024 to approximately +2% by 2025.

c. Provide all studies examining projected elasticities of demand on the DEK system over the same time frames under this scenario.

d. Confirm further that the rate increases graphically depicted in Figure 1.4 for the "Change in Policy Portfolio" will be in addition to other factors causing rates to increase (i.e., O&M, etc.).

e. Explain whether DEK has shared this information with: (i) the Governor's Office; (ii) regional chambers of commerce; (iii) Northern Kentucky Community Action Commission; and (iv) the Kentucky Industrial Utility Customers (KIUC).

f. Discuss whether Duke Energy, Ohio (DEO), and/or Duke Energy, Indiana (DEI) are projected to experience similar rate increases under this scenario (or a similar scenario).

g. Provide all studies examining elasticities of demand on the DEO and DEI systems over the same time frames.

h. Explain how the projected growth rate in DEK's rates of 1,000% will comport with the principle of gradualism.

i. Provide a discussion regarding any and all transmission system improvements DEK would have to undertake in order to wheel the renewable generation output depicted in the IRP into its service territory. Include in your discussion whether the costs of such transmission improvements have been included in the cost analyses utilized in the current IRP, and if so, how and where they were included.

j. Provide a discussion regarding any and all transmission system constraints DEK would encounter in order to wheel the renewable generation sources depicted in the IRP into its service territory. Include in your discussion whether the costs of such transmission constraints have been included in the cost analyses utilized in the current IRP, and if so, how and where they were included.

k. Provide a discussion regarding any and all transmission interconnections DEK would have to undertake in order to wheel the renewable generation sources depicted in the IRP into its service territory. Include in your discussion whether the

costs of such transmission constraints have been included in the cost analyses utilized in the current IRP, and if so, how and where they were included.

RESPONSE:

The Change in Policy portfolio includes approximately 2.8 times the combined wind, solar, and storage capacity of the 2021 IRP Portfolio by 2035.

a. The chart in Figure 1.4 depicts forecasted year-over-year rate impacts resulting from changes to the resource mix as contemplated in the portfolios shown. Rate impacts from other areas of the business (maintaining the distribution system, for example) are not included in this calculation.

The rate impacts indicated in Figure 1.4 for the Change in Policy portfolio include impacts from both capital investment and system operation. The calculations shown in the figure incorporate the base case forecast for natural gas prices and assume that no price is imposed on carbon emissions.

In the case of the rate impacts shown for the Change in Policy portfolio, the figure indicates a 0.7% increase from 2021 to 2022, a 0.6% increase from 2022 to 2023, and a 5.5% increase from 2023 to 2024, for a total increase of approximately 6.8% from 2021 to 2024. These changes are driven by investment in new resources, operations and maintenance of existing resources, and changes in electricity sales volume relative to total cost.

b. The rate impact associated with the Change in Policy portfolio operating in a scenario with the base case natural gas price forecast and no price on carbon emissions is projected to be a 5.5% increase from 2023 to 2024. This change is driven primarily by investment in new wind, solar and battery resources, increased operations and maintenance expense, and relatively slow growth in sales volume.

The projected increase from 2024 to 2025 is lower due primarily to lower incremental investment in renewable energy resources and storage combined with increasing electricity sales volume.

c. The Company has not performed this analysis and is not aware of any such analysis.

d. The chart in Figure 1.4 depicts forecasted year-over-year rate impacts resulting from changes to the resource mix as contemplated in the portfolios shown. Rate impacts from other areas of the business (maintaining the distribution system, for example) are not included in this calculation.

e. Objection. This request is vague and ambiguous and subject to interpretation as to what is meant by "this information" and thus calls for speculation. Without waiving said objection and to the extent discoverable, assuming the request is only referring to Figure 1.3, the Company has not met individually with any of the parties enumerated to discuss Figure 1.3. The Company does not know if any of the parties enumerated have reviewed the Company's IRP since it was filed.

f. Objection. This request is overbroad and unduly burdensome and seeks information that is irrelevant to the case is it seeks information related to affiliates of Duke Energy Kentucky that are not jurisdictional to this Commission. Without waiving said objection, and to the extent discoverable, the Change in Policy portfolio is specific to the Duke Energy Kentucky system and the conditions in which it operates. Comparison to Duke Energy utilities in other states with different market structures, policy regimes, and system characteristics is not possible.

g. Objection. This request is overbroad and unduly burdensome and seeks information that is irrelevant to the case is it seeks information related to affiliates of Duke Energy Kentucky that are not jurisdictional to this Commission. Without waiving

said objection, and to the extent discoverable, the Company has not performed this analysis and is not aware of any such analysis.

h. The Change in Policy portfolio was not selected as the preferred portfolio in the 2021 IRP due in part to the associated costs in the absence of a price on carbon emissions. It is possible that such a portfolio would become the prudent least cost plan for maintaining reliable electric service for Duke Energy Kentucky customers if carbon regulation were to be implemented.

i. All generation depicted in IRP would follow the PJM process. Any transmission system improvements would be site specific and be identified through PJM process.

j. All generation depicted in IRP would follow the PJM process. Any transmission system constraints would be site specific and be identified through PJM process.

k. All generation depicted in IRP would follow the PJM process. Any additional transmission system interconnections would be site specific and be identified through PJM process.

PERSON RESPONSIBLE: Scott Park – a., b., d., f., h.
Benjamin W. Passty – c., g.
Jeff Gindling – i., j., k.
Legal as to objections.

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-016

REQUEST:

Explain whether DEK's IRP modeled purchases from the PJM market, and if so: (i) how the modeling was conducted; and (ii) where in the IRP market purchases were analyzed.

RESPONSE:

Energy purchases from the PJM market are included in the IRP analysis.

(i) Energy from the PJM market is included as a potential resource in the simulation of system operation (production cost modeling). The EnCompass model, in the production cost step, selects the least cost energy mix for each hour of the analysis period through 2035 from the available Duke Energy Kentucky resources and the PJM market. Please see IRP page 17 for a description of the planning models used for the IRP analysis.

(ii) Please see IRP Section 3.B (beginning on page 20) for a discussion of forecasting PJM market energy prices. Please see IRP Figure 6.8 (page 61-62) for projected energy market purchases for each potential portfolio over the planning period.

PERSON RESPONSIBLE: Scott Park
John Swez

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-017

REQUEST:

Regarding DEK's projected purchases of wind power under either DEK's Preferred Plan (Fig. 1.2 in Executive Summary), or the Change in Policy Portfolio (Fig. 1.3 in Executive Summary), explain why DEK's wind purchases grow over the planning period in contrast with the PJM Capacity and Generation Forecast scenarios depicted in Fig. 3.3 through 3.7 at IRP pp. 21-30, in which it appears that in most of these scenarios, the percentage of PJM's on-shore wind capacity remains relatively static through the same period.

RESPONSE:

Wind energy resources included in the 2021 IRP Portfolio are part of the prudent least cost plan for maintaining reliable electric service for Duke Energy Kentucky customers while mitigating future risks. Trends in Duke Energy Kentucky procurement may not mimic overall PJM trends, and the amount of wind capacity included in the Duke Energy Kentucky IRP Portfolio by 2035 (150 MW nameplate) is not sufficient to influence PJM onshore wind capacity at the scale shown in Figures 3.3 - 3.7.

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-018

REQUEST:

Reference IRP Executive Summary, Part. B., "Three-Year Implementation Plan," paragraph 2, in which it is stated:

> "The three-year implementation plan also must make provision for increasing interest on the part of existing and prospective customers for cleaner forms of power. Indeed, customers continue to explore partnerships with the Company through which sustainability goals are achieved in a cost-effective manner that benefits the entire Duke Energy Kentucky system."

a. Explain whether DEK has considered a tariff substantially similar to that of Kentucky Utilities' Tariff GT (Green Tariff), Option 2 (Business Solar) and/or Option 3 (Renewable Power Agreement). [1,2]

RESPONSE:

Effective May 1, 2020, Duke Energy Kentucky has had the Green Source Advantage (GSA) Rate GSA available for nonresidential customers to help meet their sustainability goals. GSA is similar to Kentucky Utility Company's Green Tariff Option #3 (Renewable Power Agreement) but with a few differences. Participating customers in GSA must have 1MW or more of demand at a single location or 5MW aggregated at multiple Kentucky service locations vs. Renewable Power Agreement which requires a monthly billing

[1] Accessible at: https://psc.ky.gov/tariffs/Electric/Kentucky%20Utilities%20Company/Tariff.pdf
[2] See Case No. 2020-00016, *In Re:* Electronic Application Of Louisville Gas And Electric Company And Kentucky Utilities Company For Approval Of A Solar Power Contract And Two Renewable Power Agreements To Satisfy Customer Requests For A Renewable Energy Source Under Green Tariff Option #3.

minimum of 10MW. The term for GSA can be up to 20 years with no minimum vs. Renewable Power Agreement which has a 5 year minimum term. Lastly in GSA the customer has the flexibility to select the site either with or without Duke Energy's assistance vs. Renewable Power Agreement where a customer can only request the type of renewable resource (e.g. solar, wind, etc).

In addition to GSA, we are able to help our nonresidential customers with unbundled RECs (Renewable Energy Certificates). Currently this is by Special Contract that would be filed and approved by the Kentucky Public Service Commission (PSC).

Kentucky Utility Company's Green Tariff Option #2 (Green Tariff) was considered by the company when we filed the GSA program. At this time, we continue to not see demand from our customers on a leasing arrangement for an on-site solution; especially considering that it would be a premium product offering.

Website: www.duke-energy.com/business/products/renewables/green-source-advantage

PERSON RESPONSIBLE: Wendi Fleener

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-019

REQUEST:

Reference IRP Executive Summary, Part. B., "Three-Year Implementation Plan," paragraph 2, in which DEK states it will continue to operate within PJM as a fixed resource requirement (FRR) entity. Explain how frequently DEK evaluates switching to participating in PJM on an RPM basis. Provide the last such study in which DEK and/or DEK/DEO evaluated that option.

RESPONSE:

A decision to transition from the FRR to the Reliability Pricing Model (RPM) fundamentally rests on whether the Company believes that customers would ultimately benefit from such a change. Much of the value from moving to RPM is a function of an entity's net generation position. In other words, the benefit of RPM lies in the ability to either monetize the market value of owned generation in excess of customer demand or to gain access to the market liquidity inherent in RPM in order to fill any shortfall in generation. In the RPM capacity auction construct, a Load Serving Entity (LSE) is charged for capacity needed to satisfy its load, including reserves. Generation owners sell their capacity, and to the extent it clears the auction, the generation owners receive revenues. When a generation owner is also the LSE, like Duke Energy Kentucky would be, any capacity revenues received through RPM auctions would thus be offset by the capacity payments customers would pay in RPM. Length or shortfalls in capacity as compared to load thus translates into either a net revenue or net cost, respectively.

Since joining PJM, Duke Energy Kentucky has neither been materially long or short generation, had no immediate plans to build significant additional generation, and had found sufficient liquidity in the bilateral market to make any necessary small portfolio adjustments. Given the small net positions over the past few years, the economic analysis has been very straight forward and no formal economic analysis exists.

One other aspect of importance is how PJM's Minimum Offer Price Rule (MOPR) will affect Duke Energy Kentucky's generation if the decision is made to leave FRR and enter RPM. Past MOPR rulings have introduced risk in the event that Woodsdale or East Bend would be MOPR'D (forced to offer at a price at least equal to the MOPR amount) in an RPM implementation, giving the possibility for Duke Energy Kentucky customers to "double pay" for capacity, meaning that customers would be paying for both the asset itself and also paying again for the load buy in the RPM without any offsetting generation revenue. With the recent changes to the MOPR and implementation in 2023/2024 BRA, the Company's current generation assets will no longer be subject to the MOPR price floor, and new generation resources will likely be able to avoid this price floor as well. Given these changes, the company is currently evaluating whether the customer will benefit switching from FRR to RPM for future auctions.

PERSON RESPONSIBLE: John Swez

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-020

REQUEST:

Reference the article[1] in the footnote below, discussing a letter from American Electric Power's Chairman, President and CEO Nick Akins to Congress and other utilities, in which he expresses concerns that the Biden Administration's climate proposals would force utilities to develop clean energy "too rapidly," and would "adversely impact the reliability and resilience of the electric grid."

a. Discuss whether DEK has any reliability / resilience concerns arising from a rapid adoption of renewable energy, especially with regard to DEK's stated goal in this IRP of "[p]rovid[ing] adequate, efficient, reasonable service that is economic in an uncertain environment."[2]

b. Discuss how DEK will ensure that Kentucky ratepayers do not suffer the same rolling blackouts as California ratepayers because of California's increasing reliance on renewable sources, and decreasing reliance on fossil fuel generated energy.

c. Discuss what resources DEK will utilize to replace renewable energy sources that fail to function during routinely-occurring weather events (e.g., wind not blowing, cloudy days, solar panels covered by snow and ice). Confirm also that Europe,

[1] https://www.eenews.net/articles/major-utility-questions-bidens-signature-climate-plan/?utm_source=Energy+News+Network+daily+email+digests&utm_campaign=2e2bb87193-EMAIL_CAMPAIGN_2020_05_11_11_46_COPY_01&utm_medium=email&utm_term=0_724b1f01f5-2e2bb87193-89280531
[2] IRP, p. 10.

which is heavily dependent on renewable resources, is undergoing an energy crisis caused in part by non-functioning wind generation[3] and high gas prices, which is causing some businesses to close and leading some nations to restart coal-fired plants.[4]

d. Provide a discussion regarding how DEK will ensure that an over-reliance on renewables will not drive industry and other businesses out of its service territory.

RESPONSE:

a. Maintaining affordable and reliable service while transitioning toward a cleaner and more diverse mix of energy resources over time are central tenets of the Company's resource planning approach. The Company's planning process applies reasonable limits on volumes of each type of renewables added each year to take advantage of opportunities to improve operational and planning processes over time and address challenges of a very rapid transition that may not be fully understood at this point. The Company also performs detailed hourly production cost modeling over the fifteen year planning horizon both with and without the power market to provide additional assurance that the Duke Energy Kentucky preferred portfolio would be able to sustain a high level of reliability under peak load conditions, with or without the PJM market. At the right pace, renewable adoption can hedge risks associated with existing assets that could impose additional costs on customers, such as fuel price volatility, fuel scarcity, or a significant shift in federal climate policy. A reasonable pace of renewable adoption will help to diversify the future resource mix and provide useful operating experience while allowing time to learn from

[3] https://www.wsj.com/articles/energy-prices-in-europe-hit-records-after-wind-stops-blowing-11631528258
[4] See, e.g. https://www.wsj.com/articles/surging-energy-prices-close-u-k-factories-another-bottleneck-in-a-world-full-of-them-11631792586

industry experience with high levels of renewables in other regions. The Company believes that a moderate pace of renewable adoption is the appropriate approach for Duke Energy Kentucky customers at this time to diversify the generating mix while maintaining affordability and reliability. As the industry gains experience in planning and operation of the grid at higher levels of renewable adoption, it may be appropriate to adjust the pace of renewable adoption, with due consideration of regulatory policy, customer preferences, technology advancements, and supply chain considerations.

b. See response to part (a) above.

c. In addition to pursuing diversity of resources and modeling system operations with and without the PJM market, Duke is also participating in an EPRI Resource Adequacy initiative to advance analytic tools, processes, and metrics to ensure that reliability is not jeopardized as we pursue a transition to lower carbon resources. Although PJM is formally responsible for reliability of the PJM power supply, the Company's planning processes are designed to ensure sufficient dispatchable resources within the Duke Energy Kentucky preferred portfolio to maintain a high level of reliability even when renewables are not available.

d. Duke Energy Kentucky's continued focus on affordability, reliability, diversity, and a reasonably paced transition to cleaner resources will help to support continued economic development in the Duke Energy Kentucky service area while also mitigating risks associated with future fuel price volatility or federal carbon policy, both of which could drive a more rapid change in the Duke Energy Kentucky resource mix and result in higher costs for customers.

PERSON RESPONSIBLE: John Swez

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-021

REQUEST:

Reference the IRP, p. 13, 5., "Resource Options," wherein DEK states that when considering supply-side resources for inclusion into the Company's portfolio, DEK considers the following factors: ". . . technical feasibility, commercial availability, fuel availability and price, useful life or length of contract, construction or implementation lead time, capital cost, operations and maintenance (O&M) cost, reliability, and environmental impacts." Explain whether there is any rank-order or other prioritization of these factors.

a. Explain what priority, if any, is given to reliability.

RESPONSE:

As discussed on IRP page 17, resources that do not meet the necessary technical requirements are excluded from consideration in the IRP. Resources that meet the technical requirements are then evaluated using the EnCompass model and are selected as part of the economic optimization process. Finally, in constructing the preferred portfolio, the resource mix may be adjusted to minimize risk that may result from, for example, reliability risks, excessive market exposure, or exposure to costs that could result from potential future policy changes.

a. Reliability is given high priority. Every portfolio must meet the reserve margin requirement.

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-022

REQUEST:

In the event that DEK decides to make its residential Peak Time Rebate program a permanent tariffed offering, explain whether the Company will: (i) analyze the program as a resource option; and (ii) consider expanding the program to more residential customers.

RESPONSE:

(i) The Company has yet to determine if the Peak Time Rebate Pilot (PTR Pilot) program will become a permanent tariffed offering. If it does, the impact of the program and how to analyze it would be determined.

(ii) The Company has yet to determine if the PTR Pilot program will become a permanent tariffed offering. If it does, the Company would consider expanding program participation depending on factors such as cost effectiveness.

PERSON RESPONSIBLE: Scott Park – (i)
Bruce L. Sailers – (ii)

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-023

REQUEST:

Reference the IRP at p. 42. Confirm that DEK's portfolio optimized with carbon regulation and high gas prices triggers several different resource types – including solar, wind, gas generation and a portion of a small modular nuclear reactor.

RESPONSE:

The portfolio optimized for the scenario with carbon regulation and high gas prices includes new solar, wind, gas, and small modular reactor resources. Please see the top of Figure 6.1 (page 44).

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
Attorney General's First Set Data Requests
Date Received: October 1, 2021

AG-DR-01-024

REQUEST:

Explain whether DEK has conducted any analyses / studies regarding the potential for enhanced energy efficiency, demand side management (DSM) and/or demand response (DR) programs to help the Company achieve any potential mandated carbon emissions reductions, either in tandem with or in lieu of the Company's current plans to adopt renewable energy resources on the scale identified in the instant IRP. Include in your response:

a. the potential for dynamic line ratings on the DEOK transmission system, conservation voltage reduction and any other supply-side energy efficiency measures the Company may be examining or of which it is generally aware; and

b. any cost-benefit analyses regarding the potential benefits and costs for DSM / DR programs to achieve carbon reductions, as opposed to the costs/benefits of procuring additional renewable energy supply-side resources.

RESPONSE:

The Company has not performed this analysis.

PERSON RESPONSIBLE: Tim Duff