

VERIFICATION

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

The undersigned, Benjamin Passty, Lead Load Forecasting Analyst, 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.

Benjamin WB Passty
Benjamin Passty Affiant

Subscribed and sworn to before me by Benjamin Passty on this 6 day of December, 2021.



Sheila Lemoine
NOTARY PUBLIC

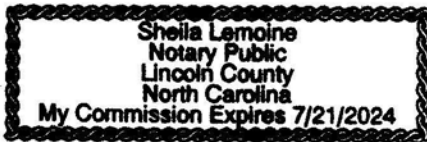
My Commission Expires: July 21, 2024

**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: Benjamin Passty

Date: December 6, 2021



Sheila Lemoine
Official Signature of Notary

Sheila Lemoine, Notary Public

My commission expires: July 21, 2024

I signed this notarial certificate on December 6, 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 Benjamin Passty on December 6, 2021.

VERIFICATION

STATE OF NORTH CAROLINA)
COUNTY OF ~~MECKLENBURG~~ &)
Lincoln)

SS:

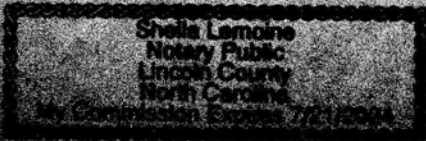
The undersigned, Scott Park, Director IRP & Analytics-Midwest, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



Scott Park, Affiant

Subscribed and sworn to before me by Scott Park on this 15 day of December 2021.


NOTARY PUBLIC



My Commission Expires

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

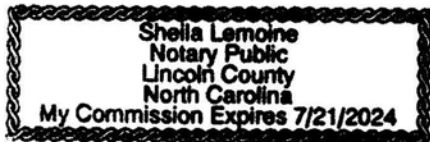
Lincoln County, North Carolina

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: Scott Park

Date: December 15, 2021



Official Signature of Notary



Sheila Lemoine, Notary Public

My commission expires: July 21, 2024

I signed this notarial certificate on December 15, 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 December 15, 2021.

KyPSC Case No. 2021-00245
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**Duke Energy Kentucky
Case No. 2021-00245
SIERRA Second Set Data Requests
Date Received: November 19, 2021**

SIERRA-DR-02-001

REQUEST:

Refer to IRP pp. 12-13, 42, 64-65. Please confirm that the “Reference with a Carbon Regulation” scenario is considered by Duke to be the 2021 IRP’s “base case” (p.12).

- a. If not confirmed, please explain why not, and explain what instead constitutes the IRP’s “base case.”

RESPONSE:

Confirmed.

PERSON RESPONSIBLE: Scott Park

Duke Energy Kentucky
Case No. 2021-00245
SIERRA Second Set Data Requests
Date Received: November 19, 2021

SIERRA-DR-02-002

REQUEST:

Refer to IRP pp. 12 & 42, and to Duke Response to AG-DR-01-001(j) (“Q: Based on all facts and circumstances known today, and recognizing the rapidly changing regulatory environment, provide the year for East Bend’s retirement which [Duke] believes to be most likely.” “A: 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 . . .”).

- a. Please confirm that, where the IRP indicates (at p.42) “With the base gas assumption [and also “optimized with carbon regulation”], the retirement of East Bend 2 is accelerated to 2027 and replaced with gas generation and solar,” that refers to the Reference with a Carbon Regulation scenario and the retirement date favored thereunder.
- b. Please confirm that the Reference with a Carbon Regulation scenario continues to reflect “those expectations considered [by Duke to be] most likely to unfold over the 15-year planning period with no major disruptions to the business environment.” (p.12)
- c. Please discuss the reconcilability of Duke’s belief that 2035 is “the most likely” retirement date for East Bend 2 “[b]ased on all facts and circumstances known today” (Response to AG-DR-01-001(j)), on the one hand, with Duke’s belief that the Reference with a Carbon Regulation circumstances are “the most likely to

unfold” and Duke’s judgment that East Bend 2 should be retired under 2027 in that scenario, on the other hand.

RESPONSE:

- a. Confirmed.
- b. Duke Energy believes that carbon regulation will happen in some fashion within the 15 year planning window and could take the form of an explicit carbon tax, an allowance type mechanism or a mass cap. The Reference w/CO2 Regulation scenario is intended to be a proxy for carbon regulation recognizing that it could take shape in numerous ways, each with potentially different impacts on the resource plan.
- c. While the Company can believe that the Reference with Carbon Regulation scenario is most likely, that does not mean that it is a certainty. For example purposes only, the Company could assign a probability to this scenario of 25% and 15% to the other 5 scenario, which would clearly make the Reference with Carbon Regulation scenario most likely, but in no way reason to plan for only that scenario.

PERSON RESPONSIBLE: Scott Park

REQUEST:

Refer to IRP pp. 34-35 & Fig. 4.1, and pp. 167-68 & CONFIDENTIAL Table H.2.

- a. Please identify and provide the technical source or sources (exhaustively) supporting the “typical capacity factor” listed for each supply-side resource listed in Fig. 4.1.
- b. Please confirm that those capacity factors refer to annual capacity factors (if not confirmed, please explain).
- c. Please confirm that the base case utilizes those respective capacity factor assumptions/projections for all potential future additions of supply-side capacity resource options (e.g., all gas CCs are assumed to have a 70% capacity factor, all CTs 10%, and so on, per the figure).
 - i. If not confirmed, please identify the respective capacity factors that the base case includes instead for each resource (and if a capacity factor projection varies over the years for a given resource, identify the capacity factor projection for each year); and explain the basis/bases for each choice.

RESPONSE:

- a. It's a compilation of data from proprietary sources, such as Guidehouse, Burns & McDonnell, NuScale, and internal data.
- b. Confirmed.

- c. The capacity factors in Figure 4.1 are for higher level screening purposes only. When it comes to modeling the Duke Energy Kentucky system, the operating specifications and costs of each resource are dispatched against the prevailing hourly power prices which will then can be summarized as a capacity factor.

PERSON RESPONSIBLE: Scott Park

REQUEST:

Refer to IRP pp. 4-5 and to Duke Energy Corporation’s website, specifically the Climate Change – Environment webpage, [https://www.duke-energy.com/Our-](https://www.duke-energy.com/Our-Company/Environment/Global-Climate-Change)

Company/Environment/Global-Climate-Change, indicating that the Duke family of utilities, across several states, has “set ambitious climate goals for our company, striving toward at least a 50% reduction in CO2 emissions from electricity generation in 2030 on the way to net-zero CO2 by 2050.”¹

- a. Please identify the reference year for that reduction goal (i.e., 50% compared to what year).
- b. Please confirm that those emissions reduction goals refer to the goals of Duke Energy Corporation across its subsidiaries, only one utility of which is Duke Energy Kentucky. If not confirmed, please clarify.
 - i. Identify any analogous goal/target/etc. for CO2 emissions reductions that Duke Energy Kentucky in particular may have, specific to its own generation.
- c. Please discuss how Duke Energy Corporation’s fleetwide CO2 emissions reductions goals are taken by Duke Energy Kentucky and factored into its own plans and resource decisions, identifying the steps or ways in which that happens

¹ See also the following statement on the same webpage: “With this focus and the continued collaboration of regulators, elected officials and stakeholders, we’re confident we can meet our goals and secure a clean energy future for the millions of Americans we are proud to serve.”

as granularly, specifically, and concretely as possible. Conversely, if Duke Energy Corporation's fleetwide CO2 emissions reductions goals are not weighed or otherwise taken into account in any tangible, specific ways by Duke Energy Kentucky in the course of its modeling and planning, please so state.

- d. Please provide an estimate:
 - i. the emissions reduction (in %), relative to the same year identified in response to (a) above, that would be associated with the IRP's "propos[al] [of] 16% of renewable resources in 2030." (p.4)
 - ii. the emissions reduction (in %), relative to the same year identified in response to (a) above, that would be associated with the IRP's scenario of "35% of generation com[ing] from renewables by 2030." (p.5)
- e. Please discuss whether a future of either 16% or 35% of Duke Energy Kentucky's generation coming from renewable resources in 2030 would be compatible with a 50% reduction in Duke's emissions by 2030.

RESPONSE:

- a. 2005
- b. Confirmed.
- c. Duke Energy's fleetwide goals are not imposed upon each individual utility; the Duke Energy Kentucky IRP looks to serve customers reliable and responsibly which would include preparing for the likelihood of carbon regulation that could significantly impact Duke Energy Kentucky customers.
- d.
 - i. The amount of carbon emission reduction for any portfolio will be a function of which scenario is assumed- the presence of carbon regulation as well as gas prices will affect the dispatch and carbon emissions of the Duke

Energy Kentucky fleet. Assuming the Reference with Carbon Regulation scenario, the preferred portfolio has over 90% reduction based on Duke Energy Kentucky fleet emissions.

ii. The amount of carbon emission reduction for any portfolio will be a function of which scenario is assumed- the presence of carbon regulation as well as gas prices will affect the dispatch and carbon emissions of the Duke Energy Kentucky fleet. Assuming the Reference with Carbon Regulation scenario, the Change in Policy portfolio has over 90% reduction based on Duke Energy Kentucky fleet emissions.

e. The extent to which either portfolio 2021 IRP portfolio (referred to as 16%) or the Change in Policy portfolio (referred to as 35%) will achieve a 50% reduction will be a function of fuel and power prices for the PJM system. For example, in a future without carbon regulation and high gas prices, coal generation would run frequently and have higher CO₂ emissions than one where there is carbon regulation with low gas and power prices.

PERSON RESPONSIBLE: Scott Park

REQUEST:

Please explain whether the 2021 IRP's load forecasts, and/or other aspects of the IRP's modeling or analysis, consider and factor in the range of possible futures vis-à-vis electric vehicle (EV) penetration in Duke's service territory.

- a. If not, please explain that choice not to take EV growth into account.
- b. If so, please discuss how the IRP does so, and explain why that discussion does not appear explicitly in the IRP (or, if it actually does, identify where).

RESPONSE:

The IRP includes the influence of EV penetration via the load forecast. EVs are considered load modifiers in the load forecast such that plug-in EV charging increases the load that Duke Energy Kentucky serves. Duke Energy Kentucky's EV load forecast is derived from a series of EV forecasts and load profiles. The Electric Power Research Institute (EPRI) provides EV forecasts specific to Duke Energy Kentucky's service area for three adoption cases (low, medium, and high) and five vehicle types. In recent years Duke Energy has used EPRI's medium adoption case with minor adjustments as needed for known or expected changes in the market. Vehicle types include plug-in EVs with 10-, 20- and 40-mile range and fully electric vehicles with 100 and 250-mile range. Unique hourly load profiles (kWh per vehicle per day) are developed internally for each vehicle type, for weekdays and weekends, and for residential and public charging. The EPRI vehicle load forecast and the unique hourly load profiles are used to develop jurisdictional hourly level

load profiles that is used as an input to feed the Duke Energy Kentucky load forecast. The load forecasting process involves estimating equations to predict demand based on historical data first, then adding the expected load from EVs to that base result.

The current impact from EVs on the load forecast is relatively small. We are forecasting that for 2022 EV charging will be less than .1% of the total load and by 2030, EVs are projected to be over 1% of the total load. However, recent announcements by the current administration and vehicle manufacturers may drive increased growth over the next decade. In future IRPs the Company will include further discussions on these impacts.

PERSON RESPONSIBLE: Matthew Kalemba