

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2021 INTEGRATED RESOURCE) CASE NO.
PLAN OF DUKE ENERGY KENTUCKY, INC.) 2021-00245

ATTORNEY GENERAL’S SUPPLEMENTAL DATA REQUESTS

The intervenor, the Attorney General of the Commonwealth of Kentucky, through his Office of Rate Intervention [“OAG”], hereby submits the following Supplemental Data Requests to Duke Energy Kentucky, Inc. [“DEK” or “the Company”], to be answered by the date specified in the Commission’s Orders of Procedure, and in accord with the following:

- (1) In each case where a request seeks data provided in response to a staff request, reference to the appropriate request item will be deemed a satisfactory response.
- (2) Identify the witness who will be prepared to answer questions concerning each request.
- (3) Repeat the question to which each response is intended to refer. The OAG can provide counsel for DEK with an electronic version of these questions, upon request.
- (4) These requests shall be deemed continuing so as to require further and supplemental responses if the Companies receive or generate additional information within the scope of these requests between the time of the response and the time of any hearing conducted hereon.
- (5) Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association, be accompanied by a signed certification of the preparer or person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person’s knowledge, information, and belief formed after a reasonable inquiry.

(6) If you believe any request appears confusing, request clarification directly from counsel for OAG.

(7) To the extent that the specific document, workpaper or information as requested does not exist, but a similar document, workpaper or information does exist, provide the similar document, workpaper, or information.

(8) To the extent that any request may be answered by way of a computer printout, identify each variable contained in the printout which would not be self-evident to a person not familiar with the printout.

(9) If the Companies have objections to any request on the grounds that the requested information is proprietary in nature, or for any other reason, notify OAG as soon as possible.

(10) As used herein, the words “document” or “documents” are to be construed broadly and shall mean the original of the same (and all non-identical copies or drafts thereof) and if the original is not available, the best copy available. These terms shall include all information recorded in any written, graphic or other tangible form and shall include, without limiting the generality of the foregoing, all reports; memoranda; books or notebooks; written or recorded statements, interviews, affidavits and depositions; all letters or correspondence; telegrams, cables and telex messages; contracts, leases, insurance policies or other agreements; warnings and caution/hazard notices or labels; mechanical and electronic recordings and all information so stored, or transcripts of such recordings; calendars, appointment books, schedules, agendas and diary entries; notes or memoranda of conversations (telephonic or otherwise), meetings or conferences; legal pleadings and transcripts of legal proceedings; maps, models, charts, diagrams, graphs and other demonstrative materials; financial statements, annual reports, balance sheets and other accounting records; quotations or offers; bulletins, newsletters, pamphlets, brochures and all other similar

publications; summaries or compilations of data; deeds, titles, or other instruments of ownership; blueprints and specifications; manuals, guidelines, regulations, procedures, policies and instructional materials of any type; photographs or pictures, film, microfilm and microfiche; videotapes; articles; announcements and notices of any type; surveys, studies, evaluations, tests and all research and development (R&D) materials; newspaper clippings and press releases; time cards, employee schedules or rosters, and other payroll records; cancelled checks, invoices, bills and receipts; and writings of any kind and all other tangible things upon which any handwriting, typing, printing, drawings, representations, graphic matter, magnetic or electrical impulses, or other forms of communication are recorded or produced, including audio and video recordings, computer stored information (whether or not in printout form), computer-readable media or other electronically maintained or transmitted information regardless of the media or format in which they are stored, and all other rough drafts, revised drafts (including all handwritten notes or other marks on the same) and copies of documents as hereinbefore defined by whatever means made.

(11) For any document withheld on the basis of privilege, state the following: date; author; addressee; indicated or blind copies; all persons to whom distributed, shown, or explained; and, the nature and legal basis for the privilege asserted.

(12) In the event any document called for has been destroyed or transferred beyond the control of the Company, state: the identity of the person by whom it was destroyed or transferred, and the person authorizing the destruction or transfer; the time, place, and method of destruction or transfer; and, the reason(s) for its destruction or transfer. If destroyed or disposed of by operation of a retention policy, state the retention policy.

(13) Provide written responses, together with any and all exhibits pertaining thereto, in one or more bound electronic volumes, separately indexed and tabbed by each response, in compliance with Kentucky Public Service Commission Regulations.

(14) “And” and “or” should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.

(15) “Each” and “any” should be considered to be both singular and plural, unless specifically stated otherwise.

Respectfully submitted,

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Certificate of Service

Pursuant to the Commission’s Orders in Case No. 2020-00085, and in accord with all other applicable law, Counsel certifies that an electronic copy of the forgoing was served and filed by e-mail to the parties of record.

This 18th day of November, 2021



Assistant Attorney General

Electronic 2021 Integrated Resource Plan Of Duke Energy Kentucky, Inc.
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1. Reference the response to AG-DR-1-1 (c). Explain whether increasing international demand for coal, and rising natural gas prices will mitigate the referenced volatility in coal markets.
2. Reference the response to AG-DR-1-1 (f). In the event such federal government program funding does become available for this purpose, explain whether DEK has any interest in pursuing such funding, or whether it will forego any efforts to obtain such funds and instead look solely to its ratepayers to pay any such stranded costs.
3. Confirm that DEK's ultimate parent company, Duke Energy, Inc., has in place a plan (hereinafter "the Corporate Plan") to reduce carbon dioxide and other greenhouse gasses (hereinafter "CO₂") throughout all of its service territories. If so confirmed:
 - a. Provide a copy of the Corporate Plan.
 - b. Explain what role, if any, that North Carolina's 2019 Clean Energy Plan played in developing, impacting or influencing the Corporate Plan.
 - c. Explain the CO₂ reduction goals that DEK has been assigned under the Corporate Plan.
 - d. Explain the CO₂ reduction goals that DEK's immediate parent, Duke Energy, Ohio ("DEO") has been assigned under the Corporate Plan.
 - e. Explain the CO₂ reduction goals that DEK's affiliate, Duke Energy Indiana ("DEI") has been assigned under the Corporate Plan.
 - f. Explain whether the carbon reduction goals of DEK, DEO and/or DEI are: (i) aggregated and considered in their entirety for Duke Midwest; (ii) whether the carbon reduction goals of one or more affiliates are considered on a stand-alone basis; or (iii) aggregated and considered in their entirety throughout all of Duke Energy, Inc.'s service territories.
 - g. Explain how the CO₂ reduction goals applicable to DEK were incorporated into the instant IRP, and how they were factored into the various analyses and scenarios included within the IRP.
 - h. If DEK has its own CO₂ reduction plan, provide a copy of such.
 - i. If any Duke Midwest affiliates have their own CO₂ reduction plans, provide copies of such.
 - j. Explain how DEK will ensure reliability of service to its customers in the face of meeting the CO₂ reduction goals.
4. With regard to the Company's responses to question no. 2, above, explain how the October 13, 2021 enactment of North Carolina House Bill 951 affects: (i) DEK and the instant IRP; (ii) North Carolina's 2019 Clean Energy Plan; (iii) the Corporate Plan referred to in question no. 2; and (iv) the CO₂ reduction plans of DEK or any other Duke Midwest affiliate.

5. Provide a comprehensive discussion of the extent to which Duke Midwest engages in and undertakes integrated resource planning processes for its three affiliated companies (DEO, DEI and DEK) on a combined basis, especially with regard to supply side resources, and whether combining supply side resources on a joint basis can provide economies of scale that may be competitive as least cost resources for each affiliate participating in such a joint supply side resource.
6. Confirm that DEI's pending IRP docket includes a preferred plan that identifies several supply side resources, including solar, solar plus storage, wind, a 1,221 MW combined cycle gas plant (CCGT), and a 1,160MW combustion turbine (CT) gas peaker.
 - a. Provide a copy of any non-confidential slide presentation that DEI provided at the November 16, 2021 meeting held with its IRP stakeholders. Provide also a link to the current IRP docket.
 - b. State when DEO's next IRP docket is expected to be filed. If an IRP docket is currently pending, provide a copy of any slide presentation provided to DEO's stakeholders. Provide a link to the most recent DEO IRP docket.
 - c. Explain whether Duke Midwest's planning processes include the possibilities and potential for more than one affiliate joining in a supply side resource in order to achieve economies of scale. If not: (i) why not?; and (ii) explain how the IRP analysis deployed is truly aimed at determining least cost resources.
 - d. Explain whether the IRP process utilized by DEK analyzed any potential cost savings that could be achieved by participating in a supply side resource that either DEO or DEI (or both) selects. If not, explain fully and completely, why not.
 - e. Explain whether Duke Midwest ever engages in planning for joint-affiliate supply side resources outside of the IRP process, including the CPCN process.
 - f. Include in your responses to question nos. 5 and 6 (and all subparts, as applicable), above, whether your responses have any bearing or relevance to the Company's response to PSC Staff's DR-2-3. If so, please explain in detail.
7. Reference the response to AG-DR-1-7.
 - a. Confirm that RECs provide additional value to renewable energy projects.
 - b. Would DEK under any circumstances allow RECs to inure to the benefit of its ultimate parent company's shareholders?
 - c. Explain whether any affiliates of DEK allow RECs to inure to shareholders' benefit.
 - d. Explain why DEK did not address the issue of RECs in this IRP.
 - e. Explain whether DEK addressed the issue of RECs in prior IRPs.
8. Confirm that the efficiency of solar panels decreases over time due to module degradation. Provide the average percentage of efficiency degradation on an annual basis.

9. Confirm that based on the combination of: (i) improving efficiency rates of solar panels; and (ii) overall decreasing costs of new solar panels, in some cases it will prove more cost-effective for solar project owners to retire existing panels prior to the end of the panels' expected lifespan, and install new panels in their place.

10. Reference the response to AG-DR-1-8 (b).
 - a. Confirm that in the case of solar Purchase Power Agreements ("PPA"), project owners would likely factor the costs of decommissioning the project into the prices charged to the solar power PPA purchaser, even though DEK (as a potential purchaser) would not itself bear the obligation to decommission the project.
 - b. Confirm that solar PV modules can contain lead, cadmium, antimony and other potentially toxic materials.
 - c. Explain whether the planning models utilized in the current IRP contain any cost estimates regarding the obligation to landowners or the Authority Having Jurisdiction ("AHJ") for the decommissioning of any solar projects or potential solar projects. If so, provide all such estimates, including estimates based on both recycling of used panels, and disposing of them in landfills.
 - d. Explain whether it is currently more cost-effective to recycle used solar panels that have reached the end of their useful life span, or to dispose of them in landfills. If the latter, explain whether the used solar panels would be designated as hazardous waste under applicable federal and Kentucky law.
 - e. Provide a list of the jurisdictions of which DEK and its affiliates are aware which regulate the disposal of solar panel components, and explain whether any such jurisdictions identify any solar panel components as hazardous waste.
 - f. Confirm that according to a 2016 EPRI study, the results of which are summarized in the slide presentation linked in the footnote below,¹ some PV modules are not classified as hazardous waste, but some modules contain hazardous materials; in fact, the study concluded in part that "Module disposal is potentially a major issue."²
 - g. Confirm that based on statements from Lu Chang, secretary general of the photovoltaics division of the China Renewable Energy Society, quoted in the article accessible in the footnote below:³
 - "The problem of solar panel disposal will explode with full force in two or three decades and wreck the environment" because it "is a huge amount of waste and they are not easy to recycle."

¹ See especially slide nos. 18-20, at: https://www.solarpowerinternational.com/wp-content/uploads/2016/09/N253_9-14-1530.pdf

² *Id.* at slide 20.

³ <https://www.forbes.com/sites/michaelshellenberger/2018/05/23/if-solar-panels-are-so-clean-why-do-they-produce-so-much-toxic-waste/?sh=854d0a7121cc>

- “The reality is that there is a problem now, and it’s only going to get larger, expanding as rapidly as the PV industry expanded 10 years ago.”
 - “Contrary to previous assumptions, pollutants such as lead or carcinogenic cadmium can be almost completely washed out of the fragments of solar modules over a period of several months, for example by rainwater.”
- h. Regarding self-built or self-owned solar projects, describe what policy(ies) DEK and its affiliates have in place regarding disposal of decommissioned solar PV cells.
- i. Explain whether DEK and its affiliates are aware of any entities which recycle solar panel components.
- j. Confirm the following quoted statement from the June 18, 2021 *Harvard Business Review* article, “The Dark Side of Solar Power,” accessible in the footnote below:⁴

“The totality of these unforeseen costs could crush industry competitiveness. If we plot future installations according to a logistic growth curve capped at 700 GW by 2050 (NREL’s estimated ceiling for the U.S. residential market) alongside the early replacement curve, we see the volume of waste surpassing that of new installations by the year 2031. By 2035, discarded panels would outweigh new units sold by 2.56 times. In turn, this would catapult the LCOE (levelized cost of energy, a measure of the overall cost of an energy-producing asset over its lifetime) to four times the current projection. The economics of solar — so bright-seeming from the vantage point of 2021 — would darken quickly as the industry sinks under the weight of its own trash. . . . It will almost certainly fall to regulators to decide who will bear the cleanup costs.”

11. Reference the response to AG-DR-1-8 (c).

- a. Provide the average dollar value per MW that DEK’s affiliates have paid to either landowners or AHJs over the last two calendar years for assurances for decommissioning costs for solar projects. Explain also whether the assurance was paid in the form of surety bond, cash deposit, or letter of credit.
- b. Provide examples of the costs that may have to be updated periodically throughout the life of the solar PV system.

12. Reference the response to AG-DR-1-8 (d). Explain whether the costs of recycling solar panel components include hazardous waste.

⁴ <https://hbr.org/2021/06/the-dark-side-of-solar-power>

13. Reference the responses to AG-DR-1-8 (e)-(f). Provide: (i) the independently verified model; and (ii) DEK's projected costs to operate, maintain and decommission a solar project, including recycling costs.

14. Reference the response to AG-DR-1-12:

- a. In the response to AG-DR-1-12 (a), regarding self-built and / or company-owned wind generation facilities not involving a PPA, explain which stakeholders (e.g., ratepayers, taxpayers, shareholders, project owners, landowners) would be responsible for paying costs of environmental contingencies and/or other tail liabilities.
- b. Confirm that in the case of wind PPAs, wind generation facility owners would likely factor and embed the costs of decommissioning the project into prices charged to the wind power PPA purchaser, even though PPA purchasers (such as DEK, potentially) would not themselves bear the obligation to decommission the project. If not confirmed, explain how wind generation facility owners recoup their decommissioning costs.
- c. Explain whether the planning models utilized in the current IRP contain any cost estimates regarding the obligation to landowners or AHJs for the decommissioning of any wind power projects or potential wind power projects. If so, provide all such estimates.
- d. Provide the average dollar value per MW that DEK's affiliates have paid to landowners and AHJs over the last two calendar years for assurances for decommissioning costs for wind power projects. Explain also whether the assurance was paid in the form of surety bond, cash deposit, or letter of credit.
- e. Provide examples of the costs that may have to be updated periodically throughout the life of the wind power system.
- f. Explain whether the costs of recycling wind generation components includes hazardous waste.
- g. Regarding the response to AG-DR-1-12 (g), explain whether a wind generating facility⁵ will, or may have to cease or reduce its operations ("curtail") at various times of the year in order to comply with regulatory requirements pertaining to the number of bird and bat fatalities. If so, explain whether: (i) such curtailed operating hours will affect the facility's capacity factor; (ii) any DEK affiliates have encountered any similar curtailment of operating hours, and explain how such curtailment(s) affected the project's cost-competitiveness (regardless of whether the project is self-owned, or whether the affiliate procures the wind generation via a PPA);⁶ and (iii) ratepayers or shareholders bear the risk of

⁵ Whether the facility is owned by DEK or an affiliate, or whether DEK procures the wind power generation via a PPA.

⁶ Include in your response whether any jurisdictional authority required a revised cost-benefit analysis for a wind generation facility to be conducted after operating hours had to be reduced in order to achieve compliance with any regulatory requirements.

additional costs incurred to procure replacement power when a wind facility's operating hours are curtailed, in whole or in part, as a means to reduce bird and bat fatalities.

- h. Provide a link to the 2021 U.S. Fish & Wildlife Service (USFWS) Wind Energy Land Based Guidelines. Provide also a listing of all other federal regulations with which wind generation facilities are routinely required to comply.
 - i. Explain whether wind generation facilities have ever had their operating hours reduced due to environmental curtailment⁷ purposes. If so, explain whether: (i) such curtailed operating hours affected the wind generation facility's capacity factor; (ii) any DEK affiliates have encountered any environmental curtailments, and explain how such curtailment(s) affected the wind generation facility's cost-competitiveness (regardless of whether the project is self-owned, or whether the affiliate procures the wind generation via a PPA); and (iii) ratepayers or shareholders bear the risk of additional costs incurred to procure replacement power when a wind generation facility experiences environmental curtailment.
 - j. Reference the response to AG-DR-1-12 (f). Explain whether USFWS and/or any other governmental authorities have ever required wind generation facilities to provide additional spacing between turbines in order to mitigate the risk of bird and bat fatalities. If so, provide examples, as well as any increase in the average number of acres needed to generate 1 MW of wind-generated power.
 - k. Explain whether DEK, its service company or affiliates are aware of any wind generating facility owners having voluntarily entered into enforceable agreements with stakeholders and/or USFWS or other governmental authorities to curtail their operations as a means of addressing the risk of bird and bat fatalities. If so, explain which stakeholders (e.g., ratepayers, taxpayers, shareholders, project owners, landowners) bear the risk of loss in obtaining replacement power.
15. Explain whether DEK agrees that environmental curtailments can reduce a wind generation facility's return on investment, thus increasing the levelized cost of energy and serving as a potential market barrier to entry for wind power.
16. Explain whether DEK has conducted any research regarding the proximity of the counties comprising its service territory (as well as any other counties within which wind generation facilities could be built, whether self-owned or whether DEK procures such power via a PPA) to any known bird and bat migratory routes.
17. Provide a discussion regarding the research that DEK affiliates that either own wind generation facilities, or procure power from wind generation facilities via a PPA, undertake to determine the proximity of the wind generation facilities to any known bird and bat

⁷ For purposes of these Data Requests, the term "environmental curtailment" includes, but is not necessarily limited to: meteorological conditions, sound emissions, and shadow flicker.

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migratory routes. Include in your response: (i) a description of any filings or reporting that the DEK affiliates were required to submit to USFWS and/or other regulatory agencies; and (ii) a copy of an actual "Bird & Bat Conservation Strategy," as referenced in the response to AG-DR-1-12 (g).

18. Reference the response to AG-DR-1-20 (c), in which the Company stated it is participating in an EPRI Resource Adequacy study ". . . to advance analytic tools, processes, and metrics to ensure that reliability is not jeopardized as we pursue a transition to lower carbon resources." Explain when the results of the study will be completed, and provide a copy of any final report when issued.

19. Reference the response to AG-DR-1-24.

- a. Explain why the Company has not performed the described analysis.
- b. Explain the process(es) DEK utilizes and undertakes in deciding whether to modify or increase its DSM, DR and EE offerings.
- c. Confirm that despite the major changes that will affect the nation's electric generation fleet in the next few years, DEK has not undertaken any analyses of whether to modify or increase its DSM, DR and EE offerings.