COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF DUKE ENERGY KENTUCKY, INC. FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO CONVERT ITS WET FLUE GAS DESULFURIZATION SYSTEM FROM A QUICKLIME REAGENT PROCESS TO A LIMESTONE REAGENT HANDLING SYSTEM AT ITS EAST BEND GENERATING STATION AND FOR APPROVAL TO AMEND ITS ENVIRONMENTAL COMPLIANCE PLAN FOR RECOVERY BY ENVIRONMENTAL SURCHARGE MECHANISM	)	**Case No. 2024-00152**

DIRECT TESTIMONY OF RANAJIT SAHU

ON BEHALF OF SIERRA CLUB

October 16, 2024

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LIST OF EXHIBITS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Ranajit (Ron) Sahu. My business address is 311 North Story Place, Alhambra, CA, 91801.

Q. BY WHOM ARE YOU EMPLOYED, AND IN WHAT CAPACITY, FOR THE PURPOSES OF THIS PROCEEDING?

A. I am self-employed and I am providing comments and testimony on behalf of the Sierra Club.

II. BACKGROUND

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.

A. I received a Doctorate in Mechanical Engineering from the California Institute of Technology (Caltech) in Pasadena in 1988. I had previously received a Master of Science degree from Caltech in 1984. My undergraduate degree was also in Mechanical Engineering at the Indian Institute of Technology in Kharagpur, India.

Q. DO YOU HAVE ANY PROFESSIONAL CERTIFICATIONS?

A. I am a Certified Permitting Professional at the South Coast Air Quality Monitoring District (SCAQMD). This district is the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties. I am also a Certified Environmental Manager in the state of Nevada. This designation is required by the Nevada Division of Environmental Protection for consultants engaged in certain environmental remediation projects specified by rule.

Q. WHAT IS YOUR OCCUPATION AND HOW ARE YOU EMPLOYED?

A. I am an engineer by training and a consultant on environmental and energy matters. I am self-employed as an independent consultant on environmental and energy issues.

Q. PLEASE DESCRIBE YOUR OCCUPATION.

A. I provide project management, air quality consulting, waste remediation and management consulting, and regulatory and engineering support consulting to a variety of private sector (e.g., industrial companies, land development companies, and law firms), public sector (such as the U.S. Department of Justice), and public interest group clients.

Q. HOW LONG HAVE YOU BEEN AN INDEPENDENT CONSULTANT?

A. Since 2000.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I have more than 32 years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources including stationary and mobile sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance involving statutes and regulations such as the Federal Clean Air Act, Clean Water Act, Toxic Substances Control Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act, Superfund Amendments and Reauthorization Act, Occupational Safety and Health Act, National Environmental Policy Act as well as various related state statutes; transportation air quality impact analysis; multimedia compliance audits; multimedia permitting, including air quality NSR/PSD permitting, Title V

permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting; multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

I have more than 32 years of project management experience and have successfully managed and executed numerous projects. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

I have provided consulting services to numerous private sector, public sector, and public interest group clients. My clients have included various trade associations as well as individual companies such as steel mills, petroleum refineries, cement manufacturers, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including the U.S. Environmental Protection Agency, the U.S. Department of Justice, several states, various agencies such as the California Department of Toxic Substances Control, and various municipalities. I have performed projects in all 50 states, numerous local jurisdictions, and internationally.

As a consulting engineer for private sector clients, I have prepared, or consulted on, dozens of applications for air permits that have included engineering analyses and impacts demonstrations, including those analyses required to meet applicable technology standards.

I am familiar with the design, operation, and technical aspects of industrial plants including major combustion sources, power plants, petrochemical plants and refineries, and air pollution control equipment. I have completed engineering projects and reviewed numerous air quality permits relating to major and minor source industrial emitters. I have evaluated and provided comments, expert reports, and testimony on major and minor source air permit matters.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS OR ANY COMMISSION?

A. No, I have not previously testified before this Commission. I have presented testimony in hundreds of proceedings across the country, which are detailed in my resume, attached hereto as RS-1.

III. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to analyze Duke's application for a Certificate of Public Convenience and Necessity and, specifically, whether Duke adequately analyzed the "status quo" alternative.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS FOR THE KENTUCKY PUBLIC SERVICE COMMISSION.

A. On Friday, October 11, 2024, Duke filed a Motion to Stay the Proceeding because new information has called into question whether this project is needed at all. Specifically, the Company recently received an unsolicited updated supply offer from its lime supplier about a potential long-term lime supply contract. Duke notes that this development may negate the need for this project entirely: "The Company has engaged with the supplier for further discussions. Although conversions [sic; assuming Duke meant conversations] continue, these

initial conversations lead the Company to recommend a brief pause in this proceeding."[1] Although Duke's Motion does not indicate any of the relevant terms of the proposed long-term supply contract, such as price, quantity, or duration, at a minimum, this offer undercuts the idea that the $125 million retrofit is needed at all. It certainly calls into question whether the proposed $125 million retrofit project is in the best interest of ratepayers, given the newly available long-term contract that would allow Duke to continue with the previously-dismissed status quo alternative. In addition, this offer, which has yet to be produced in discovery, was disclosed so late that there is no time to determine how it might change the options available to Duke. I recommend that the Commission allow another round of testimony after this has been produced in discovery so that Sierra Club and other parties have an opportunity to evaluate how it impacts the request for a certificate of public convenience and necessity, including its supporting analysis.

Q. PLEASE DESCRIBE THE EXHIBITS TO YOUR TESTIMONY.

A. I am attaching a copy of my resume.

Q. WERE THESE EXHIBITS PREPARED BY YOU OR UNDER YOUR DIRECTION OR SUPERVISION?

A. Yes.

[1] Duke Motion for Stay of Proceeding (Oct. 11, 2024) at 3.

IV. RELEVANT NEW INFORMATION ABOUT ALTERNATIVES HAS COME TO LIGHT THAT NEEDS TO BE ADEQUATELY ANALYZED AS IT COULD MOOT THE NEED FOR THE PROPOSED PROJECT

Q. What project is Duke proposing?

A. Duke filed an application for a certificate of public convenience and necessity for the construction and conversion of its existing wet flue gas desulfurization system from a quicklime handling process to a limestone handling process to continue to meet existing environmental regulations ("Limestone Conversion Project") at East Bend Unit 2 pursuant to the Public Service Commission's authority under the Kentucky Revised Statutes and Kentucky Administrative Regulations to regulate the electric utilities in the state.

Q. What alternatives did Duke consider?

A. The Company considered two alternatives to the proposed project: entering into a multi-year contract with a quicklime supplier (which it refers to as the status quo) and a process where a standard high calcium quicklime product was procured and mixed on-site with a magnesium hydroxide slurry to derive the correct chemical composition necessary to continue operating the existing wet flue gas desulfurization process. The Company never evaluated other alternatives, such as converting the plant to burn gas instead of coal.

Q. Did Duke find that the "status quo" alternative presented unreasonable risks?

A. Yes. The Company compared the cost of the proposed project to against the risk of approximately $166.1 million in potential penalties, capacity and energy replacement costs, and lost margins which Duke presumed might occur if East Bend became unavailable and inoperable due to a lack of reagents (quicklime). Essentially, Duke is saying that without the quicklime reagent, it cannot operate the East Bend plant in compliance with its Clean Air Act permits so it would need to take the plant offline.

Q. Do you think that Duke adequately considered the status quo alternative?

A. No. The Company claims that it "explored a long-term contract with the supplier" but that "[t]he supplier is not willing to enter into a long-term contract due to anticipated future non-utility demand resulting in upward pressure on future pricing."[2] But the actual request for proposal, dated March 29, 2023, and subsequent developments belie the veracity of that statement.

Q. Did the request for proposal actually seek a long-term contract with a quicklime supplier?

A. No. Duke sought [redacted], [redacted].[3] This artificially limited the viability of this alternative. Duke should have written the request for proposal to actually seek a long-term contract with a quicklime supplier. Ideally, it would have sought a contract for the remaining life of the unit. But at a minimum, Duke should have sought a four- or five-year contract, which would have allowed for Duke to explore other alternatives, such as conversion of the East Bend plant to operate on gas or for the construction and permitting of a new combined cycle plant.

Q. How did the fact that the request for proposal only sought a two-year supply of quicklime influence Duke's analysis for the scrubber modification project?

A. Duke claims that the status quo alternative presents too many risks such that it should not be considered feasible. But all of these supposed risks are a product of Duke's own making. Duke only sought short-duration [redacted]. It then claims the lack of a long-term contract exposes Duke and its ratepayers to an unreasonable risk that in the future

[2] *See* Direct Testimony of John A. Verderame on Behalf of Duke at 7.
[3] Sierra-DR-01-007(a) Confidential Attachment 1 (provided Oct. 4, 2024).

it will not be able to obtain quicklime (reagent), and thus it would need to shutdown the plant because it cannot operate within its Clean Air Act permit limits without that reagent. This shutdown would then lead to penalties and additional costs for replacement energy and capacity. But the Request for Proposal itself demonstrates that Duke never actually sought an actual long-term supply of quicklime.

Q. Were there other problems with the request for proposal for quicklime?

A. Yes. The Request for Proposal was drafted such that it would invite few offers as the terms were one-sided in favor of Duke. Specifically, the request stated that "[redacted]."[4] Such open-ended contracts are not very appealing to any vendors including quicklime suppliers as they are [redacted]. The request was written in such a way that it invited rejection. Such restrictive terms would very likely have limited the number of offers that Duke received and would have impacted the price at which suppliers would be willing to sell their product. In fact Duke received [redacted].[5]

Q. Have there been any developments since the case was filed that support your conclusion?

A. Yes. On Friday, October 11, 2024, Duke filed a Motion to Stay the Proceeding because new information has called into question whether this project is needed at all. Specifically, the

[4] Sierra-DR-01-007(a) Confidential Attachment 1 at 3 (provided Oct. 4, 2024).
[5] Sierra-DR-01-007(a) Confidential Attachment 2 (provided Oct. 4, 2024).

Company recently received an unsolicited updated supply offer from its lime supplier about a potential long-term lime supply contract. Duke states that it received the offer, which has not yet been shared with the Commission or other parties, because the supplier became aware of Duke's application in this proceeding. This suggests that had Duke drafted the Request for Proposals to actually seek long-term contracts for quicklime, it would have received offers that presented viable, reasonable means to continue the status quo or similar alternatives.

Q. Has Duke actually produced that new offer through discovery yet?

A. No. To date, Duke has not produced that new offer so we do not know how the duration(s), quantity, or price of the new offer.

Q. Does this new development impact this proceeding?

A. Yes. This new offer may negate the need for this project in its entirety. Duke is requesting $125 million for the construction and conversion of its existing wet flue gas desulfurization system from a quicklime handling process to a limestone handling process because it claims it cannot get a long-term supply of quicklime at a reasonable price. So this offer goes to the very heart of Duke's application. If Duke can secure a long-term supply of quicklime it could avoid the need for this $125 million capital investment in its entirety.

Q. Besides possibly negating the need for this proposed project, are there other impacts from this new development?

A. Yes. It alters the possible feasibility of other alternatives. For instance, in its Integrated Resource Plan, Duke claims that it will take four to five years to co-fire the East Bend plant with gas.[6] If Duke is able to enter into a quicklime contract for five years, it could evaluate whether conversion of the entire plant to gas is a lower-cost alternative. In addition, if Duke

[6] Case No. 2024-00197, Staff DR-01-022(a) (provided Aug. 13, 2024).

is able to enter into a longer-term quicklime contract, it could evaluate whether retirement of the East Bend plant and replacement with a new combined cycle plant is a lower-cost alternative. These are just two of the possible alternatives that could have their feasibility impacted by this new, long-term quicklime offer.

Q. Does this new, long-term offer provide an opportunity to avoid a wasteful capital project?

A. Yes. Existing federal Clean Air Act and Clean Water Act regulations will require Duke to modify its use of coal as a fuel source at East Bend, install pollution controls on coal-fired units, and/or to retire such units. Most notable is the U.S. Environmental Protection Agency's ("EPA") regulation of greenhouse gas emissions under Section 111(d) of the Clean Air Act. While Duke's Application notes the promulgation of this rule, the Company does not overlay the 111(d) compliance obligations and 111(d) compliance pathways with the proposed Limestone Conversion Project to determine how they would impact each other. Such a piecemealed approach can lead to stranded assets and wasteful duplication, committing ratepayers to a compliance pathway that does not represent the least-cost option to meet all compliance obligations.

Q. How could this new offer help eliminate wasteful duplication associated with 111(d) of the Clean Air Act?

A. Under 111(d) of the Clean Air Act, existing coal-fired power plants that plan to operate until 2039 or later must install a carbon capture sequestration system that captures 90% of carbon emissions by 2032.[7] Coal-fired power plants that commit to retire before 2039 (but after

[7] New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units, 89 Fed. Reg. 39,798, 39,838 (May

2032) must meet an emission rate consistent with 40% gas co-firing by 2030.[8] Coal-fired power plants that commit to retire by 2032 are not subject to the rule and need not take any action.[9] Since Duke claimed it could only get a [redacted], it assumed that it had to deal with the quicklime supply and cost issue on a different timeline than its 111(d) compliance. This new offer opens up the possibility of syncing the 111(d) compliance deadline with the quicklime cost and supply timeline. This could avoid wasteful duplication. For instance, Duke could convert the entire plant to operate on gas by 2030, operate the converted plant to 2039 and then replace the unit. Alternatively, Duke could enter into an eight-year contract for quicklime, retire East Bend in 2032 and replace it with a new combined cycle plant. Duke and the other parties need to evaluate if ratepayers can save money by avoiding this $125 million capital investment and pursuing a different alternative altogether.

Q. Have you had enough time to evaluate how this development impacts this proposal?

A. No. As I noted above, Duke told the Commission and parties about the existence of this new, long-term supply offer but it hasn't actually produced the offer. Moreover, Duke noted in its motion that it has begun negotiations with the quicklime supplier but again has not produced any evidence about the progression of those negotiations. I simply don't have the relevant information to adequately analyze how this impacts the application and supporting analysis.

9, 2024); *see* U.S. EPA, *Final Carbon Pollution Standards to Reduce Greenhouse Gas Emissions from Power Plants* at 6 (Apr. 25, 2024), https://www.epa.gov/system/files/documents/2024-04/cps-presentation-final-rule-4-24-2024.pdf.

[8] *See Final Carbon Pollution Standards to Reduce Greenhouse Gas Emissions from Power Plants* at 6.

[9] *Id*.

V. CONCLUSION

Q. WHAT ARE YOUR RECOMMENDATIONS TO THE COMMISSION?

A. I recommend that the Commission allow intervenors the opportunity to submit supplemental testimony after Duke produces all relevant information in discovery. I would recommend that the Commission provide at least 10 days from the date that the information is produced for intervenors to submit supplemental discovery so that they have time to actually analyze this alternative and other alternatives that may flow from this development.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

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AFFIDAVIT OF RANAJIT SAHU
IN SUPPORT OF DIRECT TESTIMONY ON BEHALF OF SIERRA CLUB

COMMONWEALTH OF KENTUCKY)

Ranajit Sahu

Ranajit Sahu

State of Texas
County of Tarrant

SUBSCRIBED, ACKNOWLEDGED, AND SWORN to before me by Ranajit Sahu this 16th day of October, 2024.

Sumner Rawn Wilson II
ID NUMBER
13446766-4
COMMISSION EXPIRES
July 21, 2027

Sumner Rawn Wilson II

Notary Public

Notary ID No.: 13446766-4

Electronically signed and notarized online using the Proof platform.

My Commission expires: 07/21/2027