EXHIBIT

"1"

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BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 2019-224-E
DOCKET NO. 2019-225-E

In the Matter of: South Carolina Energy Freedom Act (House Bill 3659) Proceeding Related to S.C. Code Ann. Section 58-37-40 and Integrated Resource Plans for Duke Energy Carolinas, LLC and Duke Energy Progress, LLC	))))))))	**DUKE ENERGY CAROLINAS, LLC'S AND DUKE ENERGY PROGRESS, LLC'S RESPONSE TO CAROLINAS CLEAN ENERGY BUSINESS ASSOCIATION'S FIRST SET OF INTERROGATORIES**

Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP," together with DEC, the "Companies"), by and through counsel, pursuant to Rules 103-833(B), 103-833(C) and 103-835 of the Rules of Practice and Procedure of the South Carolina Public Service Commission and the South Carolina Rules of Civil Procedure, hereby respond to Intervenor, Carolinas Clean Energy Business Association's ("CCEBA") First Interrogatories as follows:

RESPONSES TO FIRST INTERROGATORIES

1. Please refer to Public Service Commission of South Carolina Order 2021-447. Ordering paragraph 6 specifies a number of modifications that the Companies should make to their ELCC methodologies. Please indicate for each subpart of Ordering Paragraph 6 how the Companies incorporated the directive into the Modified IRPs. Also, please indicate the updated ELCC values that were used in the Modified IRP modeling.

RESPONSE: The Companies interpret the requirements of Ordering Paragraph 6 as applying to the IRP Update and not the SC Modified IRP. This understanding is based on the Commission's instruction, on page 45 of Order No. 221-447, to use a capacity expansion model that is capable

of single-step optimization and to develop and use an ELCC surface in the Companies' next IRP Updates. See below for relevant discussion:

> Duke also did not calculate the synergistic effects of solar and storage and map those results onto a surface for use in single-step capacity expansion modeling that would allow these resources to compete on equal footing with resources like gas. To correct this error, the Commission directs Duke to use a capacity expansion model in developing its next IRP Update that is capable of the single-step optimization recommended by Witness Olson. In addition to using single-step optimization, Duke shall develop and utilize an ELCC surface as recommended by Witness Olson. Order No. 221-447, at 45 (emphasis added).

Please also refer to the Companies' response to ORS AIR 7-39.

2. Please confirm whether the Companies utilized the same modeling software in preparing their Modified IRPs as they did in preparing their original IRP. If denied, please indicate what modeling software was used in preparing the Modified IRPs.

RESPONSE: The Companies used the same modeling software in preparing their SC Modified IRPs as they did in preparing the originally-filed 2020 IRPs. Specifically, the Companies used System Optimizer for capacity expansion modeling and PROSYM for production cost modeling.

3. **Please refer to Figure 2-B,** "DEC & DEP Portfolio C1 Incremental Solar Additions" in both Modified IRPs.

   a. For both DEC and DEP, provide a breakdown of annual solar additions by policy directive (e.g. x MW from CPRE, x MW from HB589, etc.).

   b. For capacity listed as "Undesignated Util COS Solar", please provide the justification or basis for utility ownership of this capacity for each year.

   c. Please explain why some years exceed the 750 MW interconnection limit that was modeled.

   d. Do the Companies believe they will be able to interconnect more than 750 MW per year as indicated in Figure 2-B?

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e. Please confirm whether the 750 MW interconnection limit was binding on the quantity of solar that was added in a given year, and that absent this limit (or if the limit were increased) whether more solar would have been selected by the model.

f. Please confirm that the model always selected the maximum allowable quantity of $38/MWh PPA solar.

g. Please confirm whether the model always selected the $38/MWh PPA option before it selected utility-owned solar.

RESPONSE:

a. Please see the attached file CCEBA_DR_1-3A.xlsx.

CCEBA_DR_1-3A.xlsx

b. There are two cost options for solar that is economically selected in the SC Modified IRP: (1) $38/MWh PPA solar; and (2) Utility cost-of-service ("COS") solar. As discussed on page 27 of the DEC SC Modified IRP, the Companies divided the annual amount of utility COS solar and $38/MWh third-party PPA solar that can be connected to 375 MW each (50% of the 750 MW solar interconnection limit). Because of this split, and because the model incrementally selected $38/MWh solar, the forced-in "undesignated" solar could not be 100% $38/MWh solar. The remaining solar that made up the forced-in "undesignated" solar was labeled as Utility COS solar because that is the only other solar option included in the IRP.

c. In some years, the total nameplate capacity of solar exceeds 750 MW. This occurs because the model selects solar in 75 MW increments, and if, at any point, the amount of solar is less than the interconnect limit, the model can select an additional unit even if selecting that solar causes the model to exceed the constraint. A complicating factor is that the 750 MW constraint is a DEC+DEP constraint, but DEC and DEP

are modeled separately in the capacity expansion model, so the capacity constraint was split 450 MW in DEC and 300 MW in DEP. However, there are some years (2026 – 2028) where DEC could select an additional unit above the 450 MW limit because DEP was not selecting up to the maximum allowed solar. If that additional flexibility was not added in DEC, then the total 750 MW constraint would not have been reached.

d. Please see the Companies' response to CCEBA DR 1-3(c) for an explanation of why some years exceed the 750 MW/year interconnection limit in the Modified IRP. Given that the Companies' historical interconnection average is approximately 500 MW, the Companies are uncertain of their ability to interconnect 750 MW of new solar per year, much less volumes beyond 750 MW. The Companies do anticipate that queue reform will improve the efficiency of studying interconnection requests and will continue to refine these assumptions in future IRPs.

e. The 750 MW (400 MW DEC / 350 MW DEP) interconnection constraint was not limiting in all years. For DEC in 2023, an additional 75 MW unit could have been selected, but was not selected by the model. For DEP in 2026-2029, an additional 75 MW unit could have been selected, but was not selected by the model.

f. Confirmed. The model always selected the maximum allowable quantity of $38/MWh solar.

g. Yes, the model always selected the $38/MWh PPA option before selecting utility-owned solar based on the inputs to the capacity expansion model, which did not

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include factors such as the cost of the replacement facility (either new PPA contract or alternative solar resource) at the end of the 20-year PPA term.

4. Please provide the Levelized Cost of Energy and revenue requirement per MWh of utility-owned solar by year for each year modeled in the Modified IRPs.

RESPONSE: The Levelized Cost of Energy ("LCOE") for resources is not calculated or used as part of the selection criteria in IRP modeling. Resources are selected based on their levelized revenue requirements. The levelized revenue requirements for the Utility COS solar are included in response to ORS AIR 7-2b. Please refer to the following files:

ORS AIR 7-2b - DEC New Gen Capital PVRR - Confidential.xls
ORS AIR 7-2b - DEP New Gen Capital PVRR - Confidential.xls.

5. Why did the Companies not create a D2, E2, and F2 portfolio consistent with the Commission's directives to use a modified natural gas and battery cost forecast?

RESPONSE: Portfolios D, E and F were illustrative in nature and designed to show different trajectories for CO2 reduction. These portfolios were also identified as heavily dependent on technology and policy advancements, and they forced emergent carbon-free technologies into the model to illustrate the impact such technologies would have on carbon reductions. As such, these emergent technologies were not economically selected by the model. In light of the Commission's directive that the Companies must select a preferred portfolio, the Companies' Modified IRPs focused on comprehensively analyzing Portfolios A, B and C under the Commission-directed modified assumptions, as these Portfolios had greater dependence on economically selected technologies that are readily available today.

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6. Please refer to Commission Order 2021-447, Ordering Paragraphs 10 and 16. Given the specific directive from the Commission to use updated natural gas and battery cost forecasts, why did Duke Energy select Portfolio C1, which was based on the Companies' original natural gas and battery cost forecast? Please explain how this selection, rather than selecting Portfolio C2, is consistent with Ordering Paragraphs 10 and 16 of Commission Order 2021-447.

RESPONSE: The Companies Modified IRPs provide Supplemental Portfolios and analysis that fully comply with the requirements of Order No. 2021-447, including incorporating the alternative modeling assumptions identified in Ordering Paragraphs 10 and 16. The Order at page 85 directed the Companies to select a preferred resource portfolio. The Companies selected Portfolio C1 as the preferred resource portfolio for the reasons stated in the Modified IRPs.

7. What is the basis for limiting third-party PPAs to only 50% of solar additions? Please indicate with specificity where the Commission approved this limit in Order 2021-447, or any other policy justification for this limit.

RESPONSE: Please see the Companies' response to ORS AIR 7-17 for an explanation as to why the Companies believe it is not prudent to rely solely on third-party solar for all solar additions. Order 2021-447 does not specify the amount of third-party solar that the Companies should include in the IRP.

8. Separately, for both DEC and DEP, please provide the MW of capacity additions forecast by Portfolio C1 by resource type for each year from 2021 to 2035.

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RESPONSE: This data has been provided in the Companies' response to ORS AIR 7-2(b). Please Refer to the following files for DEC and DEP, respectively:

ORS AIR 7-2b - DEC New Gen Capital PVRR - Confidential.xlsx
ORS AIR 7-2b - DEP New Gen Capital PVRR - Confidential.xlsx.

9. Separately, for both DEC and DEP, please provide the GWh of generation forecast by Portfolio C1 by resource type for each year from 2021 to 2035.

RESPONSE: Please see the attached file: CCEBA DR 1-9 - C1 Generation by Type. This file includes generation by type and year for DEC and DEP separately from Portfolio C1. The results shown in this file reflect the performance of Portfolio C1 in the Companies' base gas price and base CO2 emission price scenario.

CCEBA DR 1-9 - C1 Generation by Type.

10. Do the Companies plan to modify their IRPs as filed in North Carolina to reflect the changes that they made in the Modified IRPs in South Carolina? If not, please include a general discussion of how the Companies will reconcile having two different IRPs for the same system.

RESPONSE: The Companies do not plan to modify their 2020 IRPs filed in North Carolina. The Companies do not view the differences between the 2020 IRPs filed in North Carolina and the 2020 SC Modified IRPs as significant. As discussed extensively in the proceeding before the Commission, IRPs are based upon a snapshot in time and the Companies will continue to refine future IRPs to take into account evolving regulatory guidance such as Order No. 2021-447 as well as evolving policy mandates such as NC House Bill 951.

Dated this 18th day of October 2021.

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