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July 28, 2022

VIA ELECTRONIC FILING

Ms. A. Shonta Dunston
Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

RE: Development of Supplemental Modeling Portfolios
Docket No. E-100, Sub 179

Dear Ms. Dunston:

Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP" and together with DEC, "Duke Energy" or the "Companies") hereby provide this update to the North Carolina Utilities Commission ("Commission") regarding the Companies' continued engagement with the Public Staff-North Carolina Utilities Commission ("Public Staff") and certain other parties regarding supplemental modeling that the Companies will perform to further inform the Commission's development of the Carolinas Carbon Plan in this proceeding.

As previewed in the July 22, 2022 Issues Report filed with the Commission, the Companies have engaged with the Public Staff in response to its request for an additional "P5" modeling run recommended in the Public Staff's July 15, 2022 Comments. Over the past two weeks, the Companies have worked diligently with the Public Staff to discuss the proposed adjustments to the Companies' Carbon Plan modeling and to refine certain of the recommendations presented in Appendix B of the Public Staff's July 15, 2022 Comments. Through these continuing efforts, the Companies and the Public Staff have reached consensus on supplemental modeling that will provide two additional "supplemental portfolios" that can inform the Commission's assessment of Duke Energy's proposed Near-Term Execution Plan as well as the longer-term least cost pathways to achieving House Bill 951's emissions reductions targets, while ensuring the reliability of the system is maintained.

Attachment 1 to this letter—Duke Energy's Planned Supplemental Portfolios in Response to Public Staff and Other Parties' Recommendations on Duke's Proposed Carbon Plan (the "Planned Supplemental Portfolios")—presents the final set of inputs and assumptions that the Companies and Public Staff have agreed will form the basis for the "SP5" and "SP6" Planned Supplemental Portfolios. As the Commission will see from

reviewing the Planned Supplemental Portfolios, SP5 will target achieving the 70% carbon reduction interim target by 2032, while SP6 will target compliance by 2034. The Planned Supplemental Portfolios adjust the modeling approach to solar plus storage resources to allow more flexibility in storage operations as well as add an additional solar plus storage configuration.[1] The Companies will also model both an alternative "No Appalachian Gas" approach[2] as requested by Public Staff and the "Limited Appalachian Gas" assumption used to model the Companies' four base Carbon Plan portfolios, and are removing hydrogen as a fuel blended with natural gas beyond 2035, as requested by Public Staff.[3]

The Attorney General's Office ("AGO") has also recommended the Commission direct the Companies to perform additional alternative modeling. Accordingly, since filing the Issues Report, the Companies have also engaged with the AGO regarding the Planned Supplemental Portfolios, which align with many of the AGO's recommendations.[4] However, due to the expedited schedule in this proceeding as well as Duke Energy's position regarding the reasonableness and feasibility of certain of AGO's modeling recommendations, the Companies have advised the AGO that they are unable to complete additional modeling that comprehensively addresses each of AGO's alternative recommendations. The Companies are open to continued engagement with the AGO and other parties regarding the reasonableness of Duke Energy's proposed Near-Term Execution Plan, which will be informed by the Planned Supplemental Portfolios. In addition, the Companies anticipate further engagement with the parties on modeling methodologies and approaches in advance of the 2024 Carbon Plan update.

Finally, the Companies have also engaged with the Clean Power Suppliers Association ("CPSA") regarding the Planned Supplemental Portfolios and have agreed to model a high solar sensitivity as part of SP5.[5]

Duke Energy has now begun modeling the Planned Supplemental Portfolios and is working diligently towards completing this modeling analysis by August 19, 2022. The Companies plan to file the Supplemental Portfolios as part of their initial testimony, subject to further direction from the Commission.

If you have any questions, please do not hesitate to contact me. Thank you for your attention to this matter.

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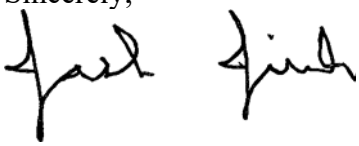
[1] See Attachment 1, Row 3.
[2] See Attachment 1, Row 8.
[3] See Attachment 1, Row 5.
[4] The Companies have footnoted such alignment in Attachment 1.
[5] For the avoidance of doubt, the Companies continue to believe that the very aggressive solar volumes proposed by CPSA are not executable in terms of achieving annual solar generator interconnections.

Sincerely,



Jack E. Jirak

cc: Parties of Record

Attachment

Duke Energy Planned Supplemental Portfolios in Response to Public Staff and other Parties' Recommendations on Duke's Proposed Carbon Plan
E-100, Sub 179

Supplemental Portfolios 5 and 6 Model Runs, to be Provided by Duke in Testimony/Supplemental Filing by August 19, 2022		
#	**Recommendation**	**Details**
1	Two discrete Model runs SP5: 2032 interim compliance date. SP6: 2034 interim compliance date.	• Use P2-P4 (base) solar interconnection limits • Allow for economic selection of up to 1,600 MW of OSW for target • Allow for economic selection of SMRs ○ First SMR available for selection mid-year 2032 in 2032 interim compliance date run (SP5)[1] • Perform two model runs (2032 and 2034) but with reduced sensitivities • Perform SP5/SP6 analysis including CT-Battery Optimization and Reliability Modeling steps, consistent with Carbon Plan Portfolios
2	Model with Belews Creek Dual Fuel Optimization through depreciable life	• Retire in 2037, continuing operation on both coal and gas ○ Fuel security remains an issue and an orderly exit from coal may require 2035 or earlier retirement of Belews Creek
3	Model with PS recommended flexible solar plus storage (SPS) modeling approach	• Allow EnCompass model to optimize charging and discharging of battery at SPS projections[2] • Limit batteries at SPS sites to charge from solar site only • Ensure SPS can capture clipped energy at solar site • Limit combinations of solar and storage configurations (ratio, duration, and transmission proxy adders)[3] – Single transmission proxy with three configuration options: 1.) ~25% ratio with 4-hour duration, 2.) ~50% ratio with 4-hour duration, and 3.) ~50% ratio with 2-hour battery
4	Remove cumulative limits on 4-hour and 6- hour batteries	• Batteries will be selected along their entire ELCC curve including option to select with zero capacity value

[1] Aligns to CPSA recommendation.
[2] Aligns to AGO recommendation.
[3] Aligns to AGO recommendation.

		• Applies to all storage, including 4-hr battery paired with solar sites.
5	Remove hydrogen (H2) as a fuel blended with natural gas[4]	• Remove H2 price influence from natural gas price forecast • Remove H2 CO_2 influence from natural gas CO_2 emissions • Remove 2047 H2 conversion costs for existing/new CT/CCs • Remove H2 CT option post 2040 • Allow for achieving 2050 goal through net-zero CO_2 strategy assuming purchase of offsets to meet 5% of the net-zero goal. ○ Use $100/CO2 as CO_2 offset price to be factored into PVRR post modeling • To the extent needed to reach the 5% net zero threshold, Duke retains the option for CTs built after 2040 to operate on 100% hydrogen . All CC/CT built before 2040 continue to operate on natural gas exclusively.
6	Model solar as PPA for 45%; increase flexibility	• Retain Carbon Plan Base assumptions, allowing zero cost curtailment of all new economically selected solar
7	Utilized low case for energy efficiency	• Retain Carbon Plan Base assumptions for development of SP5 and SP6 base portfolios • Perform low EE case as a SP5sensitivity. ○ Sensitivity off of 2032 compliance with Public Staff recommended No App Gas fuel supply assumptions

8	Remove access to Appalachian (App.) Gas	• Run SP5/P6 with agreed upon No App Gas and with Carbon Plan Base limited App. Gas assumptions
		• Other sensitivities (Low EE, Higher Solar Limit) run with No App Gas assumptions.
		• Proposed SP5/SP6 No App. Gas assumptions:
		  ○ Beginning of study period assign most efficient natural gas unit with lowest cost natural gas (Zone 4) until allotment is exhausted. Assign remaining units to operate on Zone 5 delivered.
		  ○ Assume Transco Expansion in 2028 securing addition FT necessary to provide FT for Zone 4 gas to existing CC fleet which did not already have Zone 4 gas.

9	Use simple average of Transco Z4 and Z5 for CCs; Use Z5 for CTs	
10	Fuel oil should be set to minimum blend of 20% in January for CTs, 0% for CCs	
11	Allow the model to select both J-class and F- class CTs and CCs and utilize retirement dates for existing CTs that match the most recent depreciation studies	

[4] Aligns, in part, with AGO recommendation.

		○ Allow up to 400,000 DTh/day expansion of Transco Zone 4, equivalent to up to two (2) 2x1 J-Class or up to three (3) 2x1 F-Class CCs ○ New CCs with FT from Transco Expansion, operate exclusively on natural gas throughout planning horizon • CTs operate on ultra-low sulfur diesel (ULSD) for 2 weeks in January (100% on ULSD during these 2 weeks, 100% natural gas remaining time.) • Allow EnCompass the option to select F- or J-Class CCs/CTs[5] • Retain Carbon Plan retirement dates for existing CTs, based on additional information provided by Duke.
12	Implement a transmission tariff for energy exchanges between DEC and DEP	• Implement energy hurdle rate between DEP and DEC in Capacity Expansion and exclude in Production Cost model . • Use the Public Staff recommended MWh non-firm OATT rates, with escalation. If escalation creates too much complexity, use a levelized rate.
13	Validate selection of natural gas plants through at least one full-period optimization capacity expansion model	• Given the removal of H2 from SP5, this step is not necessary
14	Higher Solar Limit Sensitivity (1500 MW in 2026 and 2027, 1800 MW in later years).[6]	• As a sensitivity to the SP5 portfolio, increase solar interconnection limits in response to Clean Power Suppliers Association. • Utilize No App. Gas assumption for this sensitivity case. • Duke continues to believe that these very aggressive solar volumes are not executable in terms of achieving annual solar generator interconnections but agrees to perform an aggressive solar case modeling as a sensitivity.

[5] Algins to AGO recommendation.
[6] Responsive to CPSA recommendation.