NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION

March 27, 2024

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

Re: Docket No. E-100, Sub 194 – In the Matter of Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities – 2023

Dear Ms. Dunston:

Attached for filing on behalf of the Public Staff in the above-referenced docket is the **public version** of the Reply Comments of the Public Staff.

By copy of this letter, I am forwarding a copy of the redacted version to all parties of record by electronic delivery. Confidential information is located on page 10. The confidential version will be provided to those parties that have entered into a confidentiality agreement.

Sincerely,

Electronically submitted
s/ Robert B. Josey
Staff Attorney
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Attachment

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STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 194

BEFORE THE NORTH CAROLINA UTILITES COMMISSION

In the Matter of Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities – 2023	))))	**REPLY COMMENTS OF THE PUBLIC STAFF**

NOW COMES THE PUBLIC STAFF – North Carolina Utilities Commission, by and through its Executive Director, Christopher J. Ayers, and respectfully submits the following reply comments pursuant to the Commission's Order Establishing Biennial Proceeding, Requiring Data, and Scheduling Public Hearing (Scheduling Order) issued on August 7, 2023, and its Order Granting Extension of Time to File Comments issued on February 6, 2024, in the above-referenced docket.

I. BACKGROUND

On November 1, 2023, Duke Energy Carolinas, LLC (DEC), Duke Energy Progress, LLC (DEP, and together with DEC, Duke), Virginia Electric and Power Company d/b/a Dominion Energy North Carolina (DENC, and together with Duke, the Utilities), Western Carolina University, and Appalachian State University d/b/a New River Light and Power Company filed their proposed avoided cost rates, standard power purchase agreements, and terms and conditions, consistent with the Scheduling Order.

On February 21, 2024, the following parties filed initial comments: the Southern Alliance for Clean Energy (SACE), the Attorney General's Office (AGO), the Carolina Clean Energy Business Association (CCEBA), the North Carolina Sustainable Energy Association (NCSEA), and the Public Staff (collectively, the Intervenors).

On March 4, 2024, DENC filed its contracts and amendments signed in 2023 between itself and Qualifying Facilities (QFs).

In these reply comments, the Public Staff responds to the initial comments filed by the Intervenors in response to the Utilities' filings made on November 1, 2023.

II. DISCUSSION

Peaker Method for Determining Avoided Capacity

In its initial comments, the Public Staff described the peaker method[1] for determining avoided capacity payments to QFs and included peaker method costs.[2] The Public Staff supported continued use of the peaker method in this case but recommended that the Utilities use an advanced class combustion turbine (CT) as an alternative, at a minimum, in the next avoided cost proceeding. In its initial comments, CCEBA stated that using the CT peaker method is likely to soon be outdated and recommended that the Commission require stakeholder meetings to

[1] Public Staff's Initial Comments, 13-14.

[2] *Id.* at 22-32.

determine a suitable replacement. CCEBA did not proffer any other technologies as a suitable replacement.

The Public Staff recommends that, in lieu of stakeholder meetings, the Commission require the Utilities to evaluate other least-cost capacity resources, as they become commercially viable, in future avoided cost proceedings. CTs will continue to be a capacity resource for the foreseeable future whether fueled by hydrogen or fossil fuels.

Duke's 2023 Fall Update for Determining Avoided Cost Rates

To determine avoided capacity and energy rates, the Public Staff recommended in its initial comments – and continues to recommend – that Duke use the 2023 Fall Update Portfolio 3 from its Carbon Plan Integrated Resource Plan (CPIRP). Portfolio 3 should allow Duke to comply with House Bill 951's[3] carbon emission reductions by 2035 at a lower cost and lower execution risk than Portfolios 1 and 2. In its initial comments, the AGO recommended that Duke use the 2023 Fall Update Portfolio 1 to determine avoided energy and capacity rates. The Public Staff notes that Portfolio 1 should allow Duke to comply with House Bill 951 by 2030 but likely would have the highest cost and highest execution risk of all three portfolios.

At this time, the Public Staff recommends that the avoided energy calculations be based upon Duke's recommended Portfolio 3. The Commission

[3] House Bill 951 was enacted as S.L. 2021-165.

has traditionally set avoided cost rates based on the utility's most recently filed IRP using the utility's preferred portfolio.[4] The Public Staff believes continuing to do so in this proceeding is reasonable.

Value of Carbon Emission Reductions

In initial comments, the Public Staff stated that "the Commission could approve a carbon reduction benefits adder for avoided energy rates, initially set at $0 per MWh as a placeholder, and direct parties to propose a calculation methodology in the next biennial avoided cost proceeding."[5] The AGO recommended that the Commission make a similar requirement in this proceeding instead of waiting for the next one.

The Public Staff believes this concept may have merit, as the calculation of avoided energy rates largely captures fuel savings and does not recognize the carbon-free system benefit of most QF power. However, no party has recommended a method for calculating this incremental value that can be evaluated. Therefore, the Public Staff would support a Commission-directed stakeholder process to develop and propose a method to value the carbon reductions from QFs applicable to avoided cost rates under PURPA for the next avoided cost proceeding. The method may include an adder, as discussed in the Public Staff's initial comments,[6] or a different avoided cost calculation method such

[4] *See* Docket No. E-100, Subs 175 and 158.

[5] *Id.* at 9

[6] *Id*. at 9.

as differential revenue requirements (DRR).[7] The Commission has previously authorized the use of the DRR method in North Carolina,[8] and it may be appropriate to revisit this method in future avoided cost proceedings.

Capacity Value of Solar

The Public Staff did not directly address the capacity value of solar in its initial comments but did discuss the volatility and intermittent nature of solar. CCEBA noted its "concern that the Joint Initial Statement and proposed avoided cost rates do not assign capacity value or provide for payments for capacity to new solar." The Public Staff disagrees. Duke proposed capacity payments during winter mornings, when the system has the highest loss of load risk. While Duke's proposed avoided cost rates do not provide capacity payments specific to solar facilities, Duke has proposed higher energy payments during peak demand times and capacity payments during times when the system has the highest loss of load risk, which has the effect of financially rewarding energy provided by any QF when customers need it the most.

CCEBA discussed the capacity value of solar paired with battery storage and pumped hydro storage. However, in this case, storage provides enhanced

[7] The DRR method compares the revenue requirements resulting from two alternative system expansion plans – one including a block of new QF capacity and the other without it. The cost differences between the two scenarios are calculated over an extended period of time, and the results are converted into present value terms that provide an estimate of the present value of the total avoided cost (capacity and energy) of the assumed block of QF capacity.

[8] *See* Order Establishing Standard Rates and Contract Terms for Qualifying Facilities, Biennial Determination of Avoided Cost Rates for Sale and Purchase of Electricity between Electric Utilities and Qualifying Facilities, No. E-100, Sub 59, (N.C.U.C. Sept. 16, 1991),14-15.

capacity value, not solar. Storage could enhance the capacity value of any intermittent generating technology, such as wind and solar, or a technology that has a more limited ramping capability such as coal and nuclear. A solar QF could add energy storage to provide capacity during winter mornings and receive capacity payments under the existing avoided cost rates.

When Duke determined the seasonal allocation of capacity value (where 100% of the capacity value is assigned to the winter morning), it did so using the 2023 Resource Adequacy Study from the 2023 CPIRP. This study assumes that all existing QF contracts are "replaced in kind" at the end of their contract term. This assumption may cause Duke to discount the capacity value of QFs, particularly solar QFs, in the summer because Duke assumes their summer capacity to already be in place.[9] If Duke assumed these QF contracts expire without replacement, as it did during the production cost modeling that underlies the avoided energy credits, it may identify a loss of load risk in the summer. This change could shift some of the capacity value to the summer and incentivize QFs to renew their contracts and continue providing the summer capacity that has been a significant driver of the shift to winter morning loss of load risk.

However, the 2023 Resource Adequacy Study is based on a single study year, 2027, when likely very few QF contracts will expire, making this issue potentially immaterial. In addition, any expiration of QF contracts would likely be dwarfed by the significant amount of new solar capacity that will be added to the

[9] This issue was raised by the Public Staff in its March 27, 2019 Reply Comments filed in Docket No. E-100, Sub 158, at 27.

system through annual competitive procurements to comply with the CPIRP, which will continue to push loss of load risk into the winter mornings. The Public Staff recommends that the Commission direct Duke to address the potential materiality of expiring QF contracts on the seasonal allocation of loss of load risk, taking into account planned additions and retirements of generation resources and changing load characteristics, in the next avoided cost proceeding.

Ancillary Services Provided by Invertor-Based Resources (IBRs)

In the previous avoided cost proceeding in Docket No. E-100, Sub 175, the Commission required Duke to study the capability of IBRs to provide ancillary services. Duke filed its Inverter Based Resources Testing Report on August 1, 2023, in Docket No. E-100, Sub 175, in which it noted that IBRs such as standalone solar photovoltaic systems at transmission level have provided some ancillary services;[10] however, these systems have limited ancillary services value because of their intermittent nature; i.e., they require a sunny day to produce most of their capacity and energy. The electric grid requires firmer capacity for the provision of significant ancillary services on a more regular basis. IBRs combined with energy storage have a much greater potential to effectively provide ancillary services due to the firmness of their capacity. However, the capacity necessary to provide Duke with dependable ancillary services is much smaller than the capacity necessary to directly meet customer load.

[10] *See* p. 17.

CCEBA and NCSEA have recommended a stakeholder process to develop requirements for a study of IBR potential to provide ancillary services. The Public Staff agrees with CCEBA and NCSEA that Duke should further study IBRs, especially solar plus storge, and include the financial value of the ancillary services IBRs provide in each configuration studied. However, the Public Staff does not believe that now is the time to conduct such a study nor is this docket the appropriate venue to determine when such study should take place and what it should look like. While the Public Staff believes the best way to procure energy storage from QFs for the provision of ancillary services is through a competitive solicitation as discussed later in these comments, the increasing quantities of energy storage (both standalone and co-located with solar) included in the CPIRP demonstrate the need for Duke to better understand the value of such services and how to integrate them into its operations. This study would require a significant amount of energy storage installed across Duke's system and would inform future CPIRP updates and utility system operations.

At this time, the Public Staff does not believe there is not enough QF storage on Duke's system for the study to gain any appreciable data. The Public Staff believes the appropriate docket for the determination of when the study should take place is the CPIRP docket, and the Public Staff will request that the Commission require a study of the ancillary services of solar plus storage in that docket at the appropriate time.

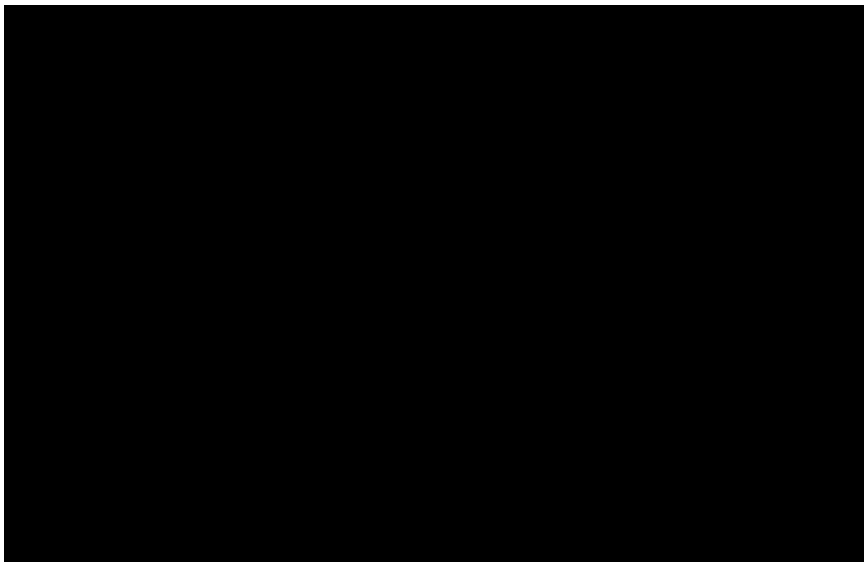
Net Excess Energy Credit (NEEC)

In its initial comments, the Public Staff agreed with Duke's updated NEEC calculation filed on February 15, 2024, and supported basing the NEEC on a five-year avoided cost term. SACE recommended that the NEEC be based on a ten-year avoided cost term and provided supporting documentation. The AGO recommended that the NEEC include the value of carbon emission reductions, similar to its recommendation on other avoided cost rates. The Public Staff has reviewed the information provided by SACE and agrees that a ten-year avoided cost term may appear to be appropriate for calculating the NEEC from a conceptual standpoint but may not be appropriate in terms of ensuring net metered customers are paid a rate for their excess energy that is fair to other consumers.

The process of calculating a levelized avoided energy rate over a particular term involves taking the present value of a series of annual avoided energy costs that are based on the production cost modeling. Next, a levelized rate is calculated that is equivalent to the annual rates, subject to the utility's discount rate. This process is shown in the chart below, which compares the annual avoided energy rate from the production cost model to the 5-year and 10-year levelized rates.[11]

[11] The avoided energy rates in this figure are all calculated consistently, using a typical solar profile, at the distribution level, and inclusive of working capital factors, marginal loss factors, fuel hedging benefits and the solar integration services charge.

[BEGIN CONFIDENTIAL]



[END CONFIDENTIAL]

The annual avoided cost rate varies over time, depending on projected fuel costs and the available generation resources in a given year. In recent proceedings, the annual rate increases over time as natural gas prices increase over time. Mathematically, the levelized rate will typically fall somewhere between the lower and upper values over a given term. As is shown in the figure above, for both the 5-year and 10-year levelized rates, in the early years the levelized rate is higher than the annual rate (representing overpayments), and in the later years it is lower (representing underpayments). Over the full term, the overpayments and underpayments essentially cancel out.

Should net metered customers be paid based on a 10-year levelized rate that is refreshed every two years, these customers will consistently be overpaid relative to the annual avoided cost rates, as they will always benefit from the early

overpayments and never be subject to the later underpayments.[12] Based on this analysis, the Public Staff believes that a NEEC based on a 5-year rate may be necessary to ensure that net metered customers pay their full fixed cost of service and are not subsidized by other customers that do not have net metered generation. A 5-year rate may result in some level of overpayments, but the magnitude is minimized relative to a 10-year rate. In order to justify the move to a NEEC based on a 10-year rate, the Public Staff would need a better understanding of how that change would impact the subsidization that was largely eliminated with the revised net metering tariffs.

The alternative would be to set the NEEC based on a 10-year rate, but only refresh the rate for each individual net metered customer every 10 years. This alternative would introduce significant complexity in the administration of Duke's updated net metering tariffs, including Rider RSC, NMB, and NSC.

If the Commission includes the value of carbon emission reduction in avoided cost rates, as the AGO has suggested, the Public Staff does not oppose including it in the NEEC as well.

SACE's witness Justin Barnes presented methods to determine avoided transmission and distribution (T&D) costs for the NEEC in his Attachment 4. The Public Staff recommends that Duke perform an analysis based upon witness Barnes' recommendations of potential avoided T&D costs that can reasonably be

[12] If natural gas prices were expected to decline over time, the opposite problem would occur – net metering customers would be underpaid relative to annual avoided cost rates.

avoided by behind-the-meter generation and discuss their potential inclusion in its next avoided cost proceeding.

SACE witness Barnes also proposed calculating an incremental distribution loss factor applicable to behind-the-meter generation that would account for the secondary distribution losses avoided when a net metering customer's exports flow directly to meet the load of nearby customers, which sometimes may not need to pass through the local distribution transformer. While this incremental loss factor may be relatively small, it still represents an incremental benefit to behind-the-meter generation exports that is not currently captured in the NEEC. This adder would only be applicable to residential net metering customers taking service under Riders Residential Solar Choice or Net Metering Bridge. The Public Staff supports the determination of this incremental distribution loss factor for the NEEC and recommends the Commission direct Duke to calculate this and update the NEEC in this proceeding.

Energy Storage System (ESS) Retrofit

In its initial comments, the Public Staff recommended that the Commission allow the rates for ESS Retrofits to expire due to lack of interest as requested by Duke. No QF owner has participated in the ESS Retrofit to date. In its initial comments, NCSEA stated, and CCEBA supported, that QF owners had difficulty installing energy storage because of economic factors such as the COVID-19 pandemic, supply chain problems, and inflation. NCSEA agreed with discontinuing the existing ESS Retrofit rates but recommended that the Commission update the

ESS Retrofit rates to make them more workable and provide a better incentive to QF owners to install energy storage.

The Commission first approved ESS Retrofits in its Order Granting Waiver and Requiring Report issued on April 28, 2020, in Docket No. E-100, Sub 101. Much has changed since that time. Section 62-110.9 requires Duke to perform "competitive procurement of energy and capacity from renewable energy facilities." Duke performs this procurement annually and has included solar plus storage as an option. Instead of offering separate avoided cost rates to QFs that install energy storage, the Public Staff recommends that Duke initiate a request for proposals specifically for energy storage co-located at existing QFs, either as part of its annual procurement or conducted in parallel. However, the Public Staff notes that any such solicitation should not be mandatory, and QFs that do not wish to participate can continue to sell their power under PURPA rates. The Public Staff intends to expand on this recommendation in its testimony in the CPIRP proceeding.

Updated Rates after the Commission's CPIRP Order

The AGO recommended that because the current CPIRP is still under review and has not been approved by the Commission, Duke should file updated avoided cost rates 90 days after the Commission's CPIRP approval to ensure better cost accuracy. As stated earlier, the Commission has traditionally set avoided cost rates based on the utility's most recently filed IRP using the utility's preferred portfolio. The Public Staff sees no reason to stray from that precedent

but defers to the Commission's discretion. Should the Commission determine that its CPIRP Order in Docket No. E-100, Sub 190 would significantly impact avoided cost rates, then the Public Staff believes the Commission should also consider whether it is appropriate to require Duke to update rates.

III. CONCLUSION

WHEREFORE, the Public Staff requests that the Commission take these reply comments into consideration in reaching its decision in this proceeding.

Respectfully submitted this the 27th day of March 2024.

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Electronically submitted
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CERTIFICATE OF SERVICE

I certify that a copy of these reply comments has been served on all parties of record or their attorneys, or both, by United States mail, first class or better; by hand delivery; or by means of facsimile or electronic delivery upon agreement of the receiving party.

This the 27th day of March 2024.

Electronically submitted
/s/ Robert B. Josey