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November 20, 2020

Ms. Kimberley A. Campbell, Chief Clerk  
North Carolina Utilities Commission  
430 N. Salisbury Street  
Raleigh, NC 27603

**RE: *Biennial Determination of Avoided Cost Rates for Electric  
Utility Purchases from Qualifying Facilities – 2018  
NCUC Docket No. E-100, Sub 158***

Dear Ms. Campbell:

On behalf of the North Carolina Clean Energy Business Alliance, the North Carolina Sustainable Energy Association, and the Southern Alliance for Clean Energy, we submit the attached **Reply Comments** in the above-referenced docket.

Should you have any questions concerning this filing, please do not hesitate to contact me.

Sincerely,

A handwritten signature in blue ink that reads 'Karen m. Kemerait'.

Karen Kemerait

KK:bs

cc: All parties of record  
Enclosure

A Pennsylvania Limited Liability Partnership

California Colorado Delaware District of Columbia Florida Georgia Illinois Minnesota Nevada  
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**STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH**

**DOCKET NO. E-100, SUB 158**

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION:

In the Matter of:  
Biennial Determination of Avoided Cost  
Rates for Electric Utility Purchases from  
Qualifying Facilities -- 2018

**REPLY COMMENTS BY  
NCCEBA, NCSEA, AND SACE**

**NOW COME** the North Carolina Clean Energy Business Alliance (“NCCEBA”), the North Carolina Sustainable Energy Association (“NCSEA”), and the Southern Alliance for Clean Energy (“SACE”) in accordance with the North Carolina Utilities Commission’s (“Commission”) *Order Establishing Standard Rates and Contract Terms for Qualifying Facilities* issued on April 15, 2002 (“April 15, 2020 Order”) and the Commission’s *Order Allowing Comments on Storage Retrofit Stakeholder Meetings Report* issued on November 5, 2020 (“November 5, 2020 Order”), and submit the following comments.

**I. PROCEDURAL BACKGROUND**

In the Commission’s April 15, 2020 Order, the Commission discussed the issues associated with integrating energy storage with existing solar facilities.<sup>1</sup> The Commission found persuasive arguments that “removing barriers to energy storage is particularly important in North Carolina because the amount of utility-scale solar that is already installed surpasses that of any other state except California.”<sup>2</sup> The Commission noted that energy storage is now a cost-competitive option, that there is likely to be a

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<sup>1</sup> April 15, 2020 Order, pp. 130-32.

<sup>2</sup> April 15, 2020 Order, p. 130.

substantial deployment of storage before the next avoided cost biennial proceeding, and that energy storage will play a significant role in enabling a more affordable, reliable, and sustainable electricity system.<sup>3</sup> The Commission therefore directed Duke Energy Progress, LLC (“DEP”), Duke Energy Carolinas, LLC (“DEC”) (together, “Duke Energy” or “Duke”), Dominion Energy North Carolina (“DENC”), and stakeholder parties to engage in discussions through a stakeholder process that would specifically address the complexities of modifying existing facilities to add energy storage.<sup>4</sup>

The Commission’s goal in directing a stakeholder process was to create a forum to:

- (a) identify critical issues that are barriers to the addition of energy storage to existing facilities;
- (b) develop solutions that will encourage deployment of energy storage;
- (c) further identify specific challenges that prevent the commercial viability;
- and
- (d) provide certainty to QFs that are considering the addition of an energy storage component to their electric generating facilities.<sup>5</sup>

The Commission further directed that “[t]he stakeholder process should be comprehensive in its consideration of all use cases for adding an energy storage component to a committed QF’s electric generating facility.”<sup>6</sup>

In accordance with the Commission’s directive, Duke Energy hosted four virtual stakeholder meetings on May 13, 2020, June 10, 2020, June 29, 2020, and July 31, 2020. NCCEBA, NCSEA, and SACE were active and collaborative participants in all four stakeholder meetings. The Public Staff also participated in the meetings. In addition to

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<sup>3</sup> April 15, 2020 Order, p. 130.

<sup>4</sup> April 15, 2020 Order, p. 131.

<sup>5</sup> April 15, 2020 Order, p. 131.

<sup>6</sup> April 15, 2020 Order, p. 131.

participating in the stakeholder meetings, NCCEBA, NCSEA, and SACE shared positions and provided technical expertise and feedback to Duke Energy.

On September 16, 2020, Duke Energy and DENC filed a Joint Report on Storage Retrofit Stakeholder Meetings (“Joint Report”).

## **II. COMMENTS**

NCCEBA, NCSEA, and SACE appreciate Duke Energy’s efforts in convening the stakeholder meetings. NCCEBA, NCSEA, and SACE believe that the stakeholders worked in good faith to try to achieve technical and regulatory solutions for modifying existing facilities to add energy storage.

The stakeholders reached consensus on five key areas about how best to remove barriers for adding storage to committed qualifying facilities (“QF”). First, the addition of storage to an existing QF would require written notice to the Commission to update the applicable certificate of public convenience and necessity (“CPCN”) or report of proposed construction, but would not require a new CPCN. The stakeholders’ understanding—that a new CPCN is not required to add energy storage to an existing facility—is consistent with Commission Rules R8-64 and R8-65.

Second, adding storage to an existing facility will be accomplished by amending the existing purchase power agreement (“PPA”) for the solar-only facility, rather than requiring a new PPA for the storage addition. The stakeholders agree that an amended PPA is not only appropriate, but simpler and more efficient than an entirely new contract.

Third, Duke and DENC state in the Joint Report that once DC revenue-grade meters are available and tested, integrating DC-connected systems will be allowed.<sup>7</sup>

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<sup>7</sup> Duke and DENC stated in the Joint Report: “Developers remain interested in using certified DC-revenue grade meters, but the major obstacle is that they are not yet available in the market. Once the standards and

Fourth, Duke is willing to allow the storage retrofit streamlined interconnection study process for both DC-connected storage retrofits and AC-connected storage retrofits. As such, Duke intends to update its waiver request in Docket No. E-100, Sub 101 to specify that the streamlined interconnection study requirements will be applicable to both DC-connected and AC-connected storage retrofits.

Finally, valuing the ancillary services that solar QFs retrofitted with storage can provide would facilitate deploying additional storage. Duke Energy correctly explains that compensation for ancillary services currently available to QFs is limited to the benefit of avoiding the Solar Integration Service Charge (“SISC”).<sup>8</sup> Duke Energy also recognizes that QFs retrofitted with storage could provide other ancillary services but for a number of “technical, commercial, and regulatory hurdles,” and supports “additional exploration of ancillary services” in other proceedings.<sup>9</sup> NCCEBA, NCSEA, and SACE support this suggestion, and note that there was intense stakeholder interest in fully accounting for the value of ancillary services and that doing so would help to overcome the hurdle to adding energy storage to existing solar QFs.<sup>10</sup>

While the stakeholders reached agreement on several ways that existing facilities can be modified to add storage without unnecessary barriers, consensus was not achieved on a number of important issues. Those areas of disagreement need to be addressed to ensure that there will not be unnecessary barriers to adding energy storage to existing QFs, and to enable important ancillary services that storage can provide.

#### **A. Term of contract for the energy storage addition**

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technology are established and approved, however, this method of measurement seems a plausible option.” Joint Report, p. 12.

<sup>8</sup> Joint Report, p. 15.

<sup>9</sup> Joint Report, p. 16.

<sup>10</sup> Joint Report, p. 19.

One of the greatest areas of disagreement among stakeholders relates to the appropriate calculation term for the separate avoided cost rate applicable to the energy storage addition. The issue of the avoided cost rate for the output of storage additions has already been decided by the Commission, but the Commission requested further input from stakeholders about the appropriate term of contract for the storage addition. Specifically, in the Commission's April 15, 2020 Order, the Commission determined that the output of storage additions should be compensated at the then-current avoided cost rate, but the Commission reserved the question of the appropriate duration of the pricing for the storage addition for discussion in the stakeholder process. From the outset, it is important to understand that the storage addition to the underlying solar-only facility will generally *not* increase the nameplate capacity of the solar-only facility as provided in the PPA.

NCCEBA, NCSEA, and SACE submit that the separate pricing applicable to the storage addition should be calculated and available for the remaining life of the QF's current solar-only PPA. In other words, the storage addition should be compensated for the remainder of the QF's current PPA, such that the fixed price available for retrofit storage would be available for as long as the fixed price for the QF it supports. The addition of storage to existing facilities is an innately productive equipment upgrade that is similar in nature to many other equipment upgrades to solar facilities that may adjust a generating facility's production profile but not increase the nameplate capacity of the facility. These types of equipment upgrades enhance the value of the generating facility and are consistent with the existing standard offer and negotiated QF PPAs. Simply put, these types of equipment upgrades to existing solar facilities do not require a new PPA.

However, Duke Energy and DENC argue that the contract term for the energy storage addition for facilities greater than 1 MW should be the *lesser* of the remaining term of the underlying solar-only PPA or five years. In other words, Duke and DENC believe that the contract term for the storage addition should be limited to five years even when there are more than five years remaining on the underlying solar-only PPA. To be clear, Duke and DENC assert that the contract term for the storage addition should be limited *even though the addition of storage will not change the nameplate capacity of the facility.*<sup>11</sup> Duke Energy’s and DENC’s problematic position on the storage retrofit PPA term is exhibited in the below chart:<sup>12</sup>

<b>Existing Solar PPA Max MW</b>	<b>Storage MW</b>	<b>Years left in solar contract</b>	<b>Fixed rate available for storage is</b>
1	1	12 years	10 years
1	1	8 years	8 years
5	1	12 years	5 years
5	1	8 years	5 years
5	2	12 years	5 years
5	2	8 years	5 years
80	1	12 years	5 years
80	1	8 years	5 years
80	40	12 years	5 years
80	40	8 years	5 years

Duke and DENC claim that allowing the output for storage additions to be compensated at current avoided cost rates for the remaining life of the PPA is

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<sup>11</sup> In the Joint Report, Duke and DENC state: “The retrofit storage is eligible for a fixed price that is the lesser of that term or the remaining term of the solar contract. The Utilities view this as a compromise if the retrofitted QF continues to be limited to the MW output that was originally contemplated in the PPA.” Joint Report, p. 20.

<sup>12</sup> Joint Report, p. 20.

inconsistent with House Bill 589 (Session Law 2017-192) (“H.B. 589”).<sup>13</sup> Their reliance upon HB 589 is misplaced. H.B. 589 in no way addresses the rights of QFs under *existing* PPAs, nor the addition of retrofit storage to QFs under contract. N.C. Gen. Stat. § 62-156 pertains to a small power producer’s sale of electricity to an electric public utility. Subsection (c) of the statute limits small power producers not eligible for the utility’s standard contract to the “most recent Commission-approved avoided cost methodology for a fixed five-year term.” The five-year contract term limitation in N.C. Gen. Stat. § 62-156(c) pertains to the small power producer’s sale of output for a *new* PPA. What is at issue here is a modification to an existing facility under an existing contract. The General Assembly in no way suggested, let alone required, that any modification to an existing contract requires that its pricing be calculated on a five-year basis. As such, H.B. 589 does not limit the storage addition to a five-year term of contract.

Duke and DENC’s position in their Joint Report is contrary to DEP’s statements and the Commission’s May 10, 2019 *Order Granting Certificate of Public Convenience and Necessity with Conditions* (“May 10, 2019 Order”) in Docket No. E-2, Sub 1185. In that docket, both Duke and the Commission recognized that battery storage does not produce electricity. On October 8, 2018, DEP submitted an application for a CPCN to construct the generation components of the Hot Springs Microgrid Solar and Battery Storage Facility (the “Hot Springs Microgrid”) in Madison County, North Carolina. The Hot Springs Microgrid project consists of a 3 MWDC / 2 MWAC solar photovoltaic (“PV”) electric generator and a 4 MW battery storage facility. In its CPCN application,

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<sup>13</sup> Duke and DENC state that they interpret “the existing commercial terms and conditions for retrofit storage to be as they are defined for QFs under HB 589’s amendments to N.C. Gen. Stat. § 62-156(b) and (c).” Joint Report, p. 20.



DEP stated it was not requesting a CPCN for the battery storage portion of the Hot Springs Microgrid project because “N.C. Gen. Stat. § 62-110.1 requires a CPCN from the Commission prior to beginning the construction of a ‘facility for the generation of electricity,’ the Company is requesting a CPCN for the solar generation-related components of the Hot Springs Microgrid only, and not for the battery storage components of the Facility.”<sup>14</sup> While expressly stating that a CPCN is not required for the battery storage components of the Hot Springs Microgrid project, DEP instead requested Commission approval for its decision to construct the battery storage components of the Hot Springs Microgrid as consistent with the Commission’s March 28, 2016 *Order Granting Application, in Part, with Conditions, and Denying Application in Part* in Docket No. E-2, Sun 1089 (the “Western Carolinas Modernization Project”). The Commission clearly agreed with DEP that a CPCN is not required for the battery storage components of the Hot Springs Microgrid. In the Commission’s May 10, 2019 Order, the Commission ordered:

1. That the Application filed in this docket should be, and the same hereby is, approved, and a Certificate of Public Convenience and Necessity for the solar generation-related components of Hot Springs Microgrid Project is granted;

...

6. That the approximately 4 MW lithium-based battery storage facilities to be constructed by DEP as part of the Hot Springs Microgrid are consistent with the Commission’s March 28, 2016 *Order Granting Application, in Part, with Conditions, and Denying Application in Part* in Docket No. E-2, Sub 1089.

Not only is Duke’s and DENC’s position (that the PPA term for the storage addition must be limited to the lesser of the remaining term of the underlying solar PPA

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<sup>14</sup> DEP’s CPCN application filed on October 8, 2018 in Docket No. E-2, Sub 1185.

or five years) not required by HB 589 and contrary to DEP's representations and the Commission's May 10, 2019 Order, but Duke's and DENC's contract term limitation would result in unnecessary barriers for the addition of emerging storage technologies to existing generating facilities. Indeed, there is no reason to believe that any QF can finance an addition of a storage device to its facility with only five years of price certainty.<sup>15</sup> Certainly, unnecessary barriers for the deployment of storage should be removed, rather than imposed, as the value of solar generating facilities to ratepayers can be significantly enhanced by the addition of storage. As discussed in the 2018 biennial avoided cost proceeding in this docket, it is broadly recognized that energy storage resources in general, and utility-scale batteries in particular, will play an increasingly significant role in enabling a more affordable, reliable, and sustainable electricity system. It is in part for this reason that the North Carolina General Assembly in H.B. 589 required a study on energy storage technologies to assess their potential value to North Carolina consumers. The results of the study published by NC State University in December 2018 concluded that "[e]nergy storage can help ensure reliable service, decrease costs to ratepayers, and reduce the environmental impacts of electricity production."<sup>16</sup> It is also in part for this reason that the Federal Energy Regulatory Commission ("FERC") issued a major decision on February 15, 2018 in Order No. 841 for the explicit purpose of removing barriers to storage resources in the capacity, energy, and ancillary services markets operated by Independent System Operators (ISOs) and Regional Transmission

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<sup>15</sup> It should be recalled that the five-year term for PURPA contracts was included in H.B. 589 for the express purpose of discouraging PURPA contracts and driving North Carolina solar development into the CPRE competitive procurement program, which has been largely successful. The number of new PURPA contracts executed since the passage of H.B. 589 has declined dramatically and has been largely limited to a single solar developer.

<sup>16</sup> North Carolina State University, *Energy Storage Options for North Carolina*, prepared for the NC Energy Policy Council Joint Legislative Commission on Energy Policy, December 2018.

Organizations (RTOs). As FERC stated in that Order, “we find that existing RTO/ISO market rules are unjust and unreasonable in light of barriers that they present to the participation of electric storage resources in the RTO/ISO markets, thereby reducing competition and failing to ensure just and reasonable rates.”<sup>17</sup> On April 19, 2018, FERC issued Order No. 845,<sup>18</sup> which amended its interconnection rules to remove potential barriers to the interconnection of storage resources on FERC-jurisdictional systems.<sup>19</sup>

While there is currently only a small amount of battery storage capacity deployed in North Carolina, solar-plus-storage resources will provide unique values over stand-alone storage resources. Storage can enable existing solar generators to become more dispatchable, storing solar generation during off-peak periods when it is needed less—at times when that generation would otherwise be clipped or curtailed altogether—and instead discharging onto the grid when the output is needed most and provides the greatest ratepayer value. The solar-plus-storage resource can help avoid the cost of expensive new peaking capacity, and can provide more predictable output that will help to reduce some of the issues related to the intermittency of solar facilities. In light of the tremendous value of energy storage to ratepayers, the deployment of energy storage should be encouraged, rather than hindered.

## **B. Metering and billing considerations**

A solar QF that installs a storage retrofit should not be required to have three meters to track its output. In its Joint Report, Duke explains that batteries could be connected either on the DC side of solar inverters or on the AC side, and in either case

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<sup>17</sup> Federal Energy Regulatory Commission, Docket Nos. RM16-23-000; AD16-20-000; Order No. 841, February 15, 2018.

<sup>18</sup> Federal Energy Regulatory Commission, Docket Nos. RM17-8-000; Order No. 845, April 19, 2018.

<sup>19</sup> As Duke Energy does not participate in an ISO or RTO, Duke is outside of federal regulatory guidance and is not required to comply with FERC Order 841.

would require a meter.<sup>20</sup> The joint result of this process and the SISC process could be to require a solar QF with storage to employ one standard revenue meter, one SISC Meter, and one storage meter. In response to SACE's and others' requests that Duke Energy simply replace revenue meters with meters capable of tracking five-minute usage data, *i.e.*, "SISC Meters," Duke Energy agreed to "install a second meter as needed at no expense to QFs" and to study it for two years.<sup>21</sup> This will relieve some of the burden on QFs, but will still result in too many meters and an unnecessary burden on developers. A better solution would be the meter swap proposed by intervenors in the SISC briefing.<sup>22</sup>

In addition, there should be no doubt about the ability of Duke Energy's billing system to accommodate the metering required to compensate storage retrofits. Duke Energy states that the "billing system *should* be able to subtract the storage meter from the whole-facility meter to calculate the solar output and then apply the appropriate rates to the storage output and the solar output."<sup>23</sup> The system's ability to accommodate meter configurations should be verified before one is selected, and corrected if inadequate.

### **C. Timeline for availability of DC meters**

In order for DC-connected storage retrofits to be feasible, DC meters need to be available to measure the energy coming out of the battery before it enters the inverter.<sup>24</sup> Duke and DENC state that the current obstacle with metering DC-connected storage is that there are no certified "revenue grade" DC meters because the American National Standards Institute ("ANSI") Standard C12.32 (to determine how a DC meter is gauged

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<sup>20</sup> Joint Report, pp. 6-8.

<sup>21</sup> Duke Energy Comments on Avoidance of SISC Requirements 4, July 31, 2020.

<sup>22</sup> See Initial Comments of Southern Alliance for Clean Energy on Proposed Requirements for Avoidance of SISC, July 13, 2020.

<sup>23</sup> Joint Report, p. 18 (emphasis added).

<sup>24</sup> Joint Report, p. 7.

for accuracy and calibrated) is in development and not yet approved. Duke and DENC further state that an EMerge Alliance task force that is working closely with ANSI and other organizations<sup>25</sup> should complete a draft of ANSI Standard C12.32 for public review in the fall of 2020.<sup>26</sup> Duke and DENC anticipate that ratification of ANSI Standard C12.32 should occur in early 2021. They suggest that upon ratification, DC meter manufacturers and test labs can begin to produce DC meters and provide them to the utilities for testing. However, Duke and DENC provide an overly conservative estimate of when DC meters might be available—they state that DC meters might not be available until early 2022.

Once ANSI Standard C12.32 has been approved, NCCEBA, NCSEA, and SACE believe that Duke and DENC should work as expeditiously as possible to obtain DC meters from meter manufacturers and then test the meters. NCCEBA, NCSEA, and SACE submit that Duke and DENC should ensure that there will not be unnecessary delays in their efforts to request DC meters from the manufacturers and test the meters. Any delay on the part of Duke and DENC would result in delaying the addition of DC-connected storage, which would be consequential to both solar developers and ratepayers. NCCEBA, NCSEA, and SACE request that the Commission require Duke and DENC to file reports on a quarterly basis about the status of (1) approval of ANSI Standard C12.32, (2) Duke's and DENC's request that DC meter manufacturers provide DC meters for testing, and (3) Duke's and DENC's testing of DC meters. During discussions with Duke during the stakeholder process, it is the understanding of NCCEBA, NCSEA, and SACE that Duke is willing to provide such reports to the Commission.

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<sup>25</sup> Those other organizations include NEMA, NIST, SCE, SRP, Xcel, Erot, Radian Research, Powertech Labs, Sensus, Accuenergy, Measurlogic, Aclara, Comcast, Nextek Power, Watthour Engineering.

<sup>26</sup> Joint Report, p. 7.

**WHEREFORE**, NCCEBA, NCSEA, and SACE respectfully request that the Commission direct Duke and DENC to (1) calculate the avoided cost rate applicable to a storage addition over the remaining life of the QF's existing PPA, (2) confirm that their billing systems can accommodate the metering configurations necessary for storage retrofits, and (3) provide quarterly reports to the Commission on the availability of DC meters.

Respectfully submitted this 20th day of November, 2020.

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## CERTIFICATE OF SERVICE

I hereby certify that a true and exact copy of the foregoing Reply Comments have been duly served upon counsel of record for all parties to this docket by either depositing a true and exact copy of same in a depository of the United States Postal Service, first-class postage prepaid, and/or by electronic delivery as follows:

This the 20<sup>th</sup> day of November, 2020.

*/s/ Karen M. Kemerait*  
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