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January 11, 2019

**VIA Electronic Filing**

Ms. M. Lynn Jarvis, Chief Clerk
North Carolina Utilities Commission
Dobbs Building
430 North Salisbury Street
Raleigh, North Carolina 27603

**Re: Docket Nos. E-100, Sub 101; E-7, Sub 1156; and E-2, Sub 1159**
**North Carolina Interconnection Procedures**

Dear Ms. Jarvis:

Enclosed for filing in the above-captioned dockets on behalf of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC ("Duke Energy" or "the Companies"), please find the *Corrected Rebuttal Exhibit JWR-4* – Public Version. The Companies are making this filing to redact certain information designated as confidential by an intervenor in this proceeding, which was inadvertently not redacted and publicly disclosed as part of Rebuttal Exhibit JWR-4 included in the Companies' rebuttal testimony filed in this docket on January 8, 2019. The confidential pages of Rebuttal Exhibit JWR-4 are being separately filed under seal.

This morning I have also requested the Chief Clerk of the North Carolina Utilities Commission remove Rebuttal Exhibit JWR-4 from the Companies' January 8, 2019 filing in this docket.

I apologize for any inconvenience, and please feel free to contact me with any questions. Thank you for your assistance in this matter.

Very truly yours,

*/s/E. Brett Breitschwerdt*

EBB:kjg

Enclosure

**Duke Energy Carolinas, LLC and**
**Duke Energy Progress, LLC**
**Rebuttal Testimony of Jeffrey W. Riggins**

**Corrected Rebuttal Exhibit JWR-4**

**Public Staff and Intervenor Responses to Data Requests**

**Interstate Renewable Energy Council**
**Response to DEC/DEP First Data Request to IREC**
**NCUC Docket E-100, Sub 101**
**Page 27 of 35**

## Interstate Renewable Energy Council (IREC)

**Request 1-18 (Auck Direct Testimony):**

Referencing Ms. Auck's statement on Page 29, Lines 2-3, that "[s]ome states do not post a public queue for NEM projects," please identify all states and/or utilities that IREC is referring to that require or voluntarily provide queue reporting of larger generator interconnection but not smaller net energy metering projects.

Please also identify all states and/or utilities that IREC of which IREC is aware that require queue reporting of net energy metering project's status in the interconnection process.

**Response**:

To IREC's knowledge, the following states require, or utilities voluntarily provide, interconnection queue reporting only of large or non-NEM generator interconnections:

- California (note however that California publishes separate data on NEM projects which provides information on acceptance and completion dates).
- Massachusetts (provided to State Department of Energy Resources, which makes aggregated information public)

To IREC's knowledge, the following states require, or utilities voluntarily provide, interconnection queue reporting of NEM projects:

- Hawaii
- Minnesota
- New York
- New Jersey
- ComEd in Illinois

These are the state queues which we are most familiar with. Additionally, many utilities publish transmission interconnection queues via OASIS and some may also include distributed systems in that queue as well. Other utilities and states may also have similar queues.

**Interstate Renewable Energy Council**
**Response to DEC/DEP First Data Request to IREC**
**NCUC Docket E-100, Sub 101**
**Page 28 of 35**

## Interstate Renewable Energy Council (IREC)

**Request 1-19 (Auck Direct Testimony):**

Referencing Ms. Auck's testimony at Pages 35-40 relating to utility-published hosting capacity maps, including IREC's "ideal format—adopted by Pepco in the Mid-Atlantic, in California, New York, and Minnesota," your testimony does not address the cost to develop and deploy HCMs. Please discuss your understanding of the cost of deploying HCMs and provide any information or regulatory filings that address either the initial capital investment or ongoing operations and maintenance expense of offering an HCM in the ideal format recommended by IREC.

**Response**:

IREC does not have comprehensive materials on the actual cost of HCMs, which is not information that that states have typically documented in the dockets we have participated in. These costs may be available in general rate case filings or elsewhere but IREC does not have them in our possession.

**Interstate Renewable Energy Council**
**Response to DEC/DEP First Data Request to IREC**
**NCUC Docket E-100, Sub 101**
**Page 29 of 35**

## Interstate Renewable Energy Council (IREC)

**Request 1-20 (Auck Direct Testimony):**

Referencing Ms. Auck's direct testimony at Page 48 and footnote 65 relating to timeline enforcement mechanisms, please identify each state in which IREC has advocated that a timeline enforcement mechanism be adopted since 2012.

Has any state other than California and Massachusetts adopted a timeline enforcement mechanism during this period?

**Response**:

To clarify, California does not currently have a timeline enforcement mechanism adopted. The issue is currently being discussed in an interconnection stakeholder working group.

Since 2012, IREC has participated in the following dockets where there have been discussions about accountability regarding timelines: California, Massachusetts, New York, Montana, Minnesota, and North Carolina. Note that IREC has not necessarily advocated for adoption of enforcement mechanisms in each of these states, but there has been some discussion of accountability mechanisms in each. IREC advocates for timeline enforcement mechanisms only in states where IREC has identified concerns with timeline adherence.

The states that IREC is aware that currently have adopted timeline enforcement mechanisms are Massachusetts and New York.

**Interstate Renewable Energy Council (IREC)**

**Docket No. E-100, Sub 101**
**Public Staff Data Request No. 1**
**Date Sent: November 1, 2018**
**Requested Due Date: November 12, 2018**

**Requested by: Jeff Thomas**
**Phone #: 919-733-0885**
**Email: jeff.thomas@psncuc.nc.gov**

**Public Staff Legal Contacts:**
**Layla Cummings – Phone #: 919-733-0887**
**Fax #: 919-733-9565**
**Email: layla.cummings@psncuc.nc.gov**
**Tim Dodge – Phone #: 919-733-0881**
**Email: tim.dodge@psncuc.nc.gov**

**Please provide any available responses electronically. If in Excel format, include all working formulas.**

**Topic 1: NCIP Revisions - Fees**

1. In attachment B to the comments filed on January 29, 2018 in the above captioned docket, IREC provides a comparison with California utility fees.

Note that the table IREC included in attachment B was prepared by Duke Energy, not by IREC.

a. Please provide any further information IREC has regarding those fees, including any breakout cost elements that form the basis for the fees (labor, licensing fees, etc.).

As part of a docket regarding the update of the net energy metering (NEM) program, the California Public Utilities Commission required each of the major investor owned utilities (IOUs) in California to set a standardized interconnection fee for NEM projects under 1 MW. The fee for each IOU was to be based on the interconnection costs shown in advice letters that

track interconnection costs expended for NEM projects, filed by each IOU. Note that these letters do not track costs for all interconnections, only for NEM projects below 1 MW which constitute the vast majority of projects in the state. A standard $800 application fee (plus deposits for the study process if applicable) is charged to most other projects. Each IOU was required to include only the following costs in its filings: NEM Processing and Administrative Costs; Distribution Engineering Costs; and Metering Installation/Inspection and Commissioning Costs. The IOUs first filed their advice letters in 2015 and have continued to file subsequent updates to them each year since, although they have not sought to actually update the fees each year. *See* CPUC Decision 16-01-044 at 88; D.14-05-033 and Res. E-4610.

IREC is including the three most recent Advice Letters as attachments to this response for your information. Each letter provides a description of the costs included in each category. Please reference each letter for specifics. Note that the interconnection application fee derived from these letters does not include the facility upgrade costs (it is our understanding that these costs are recovered directly from the interconnecting customer in North Carolina). IREC reached out to the CPUC staff and they indicated that they do not have further information on the costs categories beyond what is provided in the attached Advice Letters.

Letters linked here:


SDG&E AL 3273-E on NEM interconne


PGE AL 5398-E on NEM Interconnectio


SC AL 3866-E on NEM Interconnectio

PG&E's latest letter states that: "Additional various costs and fees associated with the interconnection process incurred by PG&E are not reflected under this report or recovered through the current NEM interconnection fee. These costs relate to Electronic Signature requests, Online payments, Online portal submittals, other IT related expenditures and enhancements, etc." PG&E Advice Letter 5398-E, Oct. 4, 2108 at 2. Thus it appears that PG&E's fee may include additional costs not captured in the letter. Neither San Diego Gas and Electric (SDG&E) or Southern California Edison (SCE) included a similar caveat in their letters.

While these Advice Letters may not provide a complete picture of all potential costs incurred by the utilities associated with interconnection of

NEM generators, they have revealed that there may actually be over-collection of fees for some other categories of generators. The standard fee for an application is $800 which is substantially higher than the tracked costs being reported for the NEM projects below 1 MW. It is expected that processing costs for projects greater than 1 MW and other categories of projects may be higher, but it has not yet been determined whether this is the case, and if so, to what extent. We thus note that it would not be safe to assume, without further evidence, that there are significant costs that are not being recovered from interconnection customers. Unfortunately, IREC is unaware of any state that has done a detailed tracking of overall interconnection cost expenditures.

b. Is IREC aware of any policies in California that allow those utilities to recover any of the costs from general retail customers that may otherwise be included in fees the utilities charge in North Carolina specifically to interconnection customers?

It is IREC's understanding that some costs that may be directly or indirectly related to the utility's processing of interconnection applications may be recovered through general rate cases in California.

2. During the October 29, 2018, conference call with the Public Staff, counsel for IREC indicated that utilities in California recover the costs of developing and maintaining hosting capacity maps from their general retail customers. Please confirm that utilities in California (and any other states IREC is aware of) recover the cost of developing hosting capacity maps from their general retail customers, and do not charge those costs only to interconnection customers.

It is IREC's understanding that the costs for the development of hosting capacity maps have largely been recovered through general rate cases. We are unaware of any state that has charged interconnection customers for the costs of developing a hosting capacity analysis.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100 SUB 101

| | | |
|---|---|---|
| In the Matter of Petition for Approval of Generator Interconnection Standards | ) ) ) ) ) ) ) | DUKE ENERGY CAROLINAS, LLC'S AND DUKE ENERGY PROGRESS, LLC'S SECOND DATA REQUEST TO THE PUBLIC STAFF |

Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP" and together the "Companies"), by and through their legal counsel, hereby submit their First Data Request to the North Carolina Utilities Commission—Public Staff ("Public Staff"). Please forward responses to the following data requests to the undersigned within **ten (10)** days (Monday, December 17) from the receipt of these requests (December 5, 2018):

## DEFINITIONS

The following definitions apply throughout the discovery request and are deemed to be incorporated therein:

A. "Document" means all written, recorded or graphic matters, however produced or reproduced, pertaining in any manner to the subject of this proceeding, whether or not now in existence, without limiting the generality of the foregoing, all originals, copies and drafts of all writings, correspondence, telegrams, notes or sound recordings of any type of personal or telephone communication, or of meetings or conferences, committee meetings, memoranda, inter-office communications, studies, analyses, reports, results of investigations, reviews, contracts, agreements, working papers, statistical records, ledgers, books of account, vouchers, bank checks, x-ray prints, photographs, films, videotapes, invoices, receipts, computer printouts or other products of computers, computer files, stenographer's notebooks, desk calendars, appointment books, diaries, or other papers or objects similar to any of the foregoing, however denominated. If a document has been prepared in several copies, or additional copies have been made, and the copies are not identical (or which, by reason of subsequent modification of a copy by the addition of notations, or other modifications, are no longer identical) each non-identical copy is a separate "document."

B. "And" or "or" shall be construed conjunctively or disjunctively as necessary to make the requests inclusive rather than exclusive.

C. The terms "you" and "your" refer to the Public Staff and its respective employees, agents, consultants and witnesses who have provided testimony on behalf of the Public Staff in the above-referenced proceeding.

New York's Joint Utilities Supplemental Distributed System Implementation Plan provided information regarding the Hosting Capacity Analysis roadmap being carried out under NY's 'Reforming the Energy Vision' program.

NY - Supplemental Distributed System I

Functional, online HCMs hosted by Xcel Energy and Southern California Edison provided insight as to what HCMs might look like and the type of information they might provide.

http://www.arcgis.com/home/webmap/viewer.html?webmap=e62dfa24128b4329bfc8b27c4526f6b7

https://www.xcelenergy.com/working_with_us/how_to_interconnect/hosting_capacity_map

In addition to reviewing several state initiatives, the Public Staff also reviewed documentation for one of the more popular HCM tools, EPRI's DRIVE. The following papers were reviewed for relevant information.

EPRI - Distirbution Feeder Hosting Cap

EPRI - DRIVE.pdf

Finally, documentation for the CYME EPRI DRIVE Module was reviewed to understand how existing tools could be integrated with commonly used circuit modeling software.

CYME - EPRI DRIVE Module.pdf

2-3 On Page 30, Lines 4-9, Mr. Lucas recommends maintaining the current 10 business days to schedule a scoping meeting after an Interconnection Request is deemed complete. As described in Witness Riggins' testimony at Page 25, Line 9 to Page 26, Line 15, the Companies are proposing to perform an initial "technical review" of all Section 4 Interconnection Requests to allow for a more informed scoping meeting and to preliminarily identify potential issues such as system constraints. The requested scheduling extension to 30 business days allows the Companies time to prepare this

technical information. Does this additional information alter Public Staff's view of the appropriate timing?

**Response:**

**Name and title of person responding to request:** Tim Dodge, Staff Attorney; Jay Lucas, Utilities Engineer.

The Public Staff recommends that the Utilities discuss the level of detail necessary for the scoping meeting with the DG developers. If the DG developers agree with Duke Energy that a later scoping meeting or initial "technical review" would provide additional meaningful technical data and improve the overall efficiency of the interconnection process, the Public Staff would not object to a 30-business day timeframe for the provision of additional data.

2-4 On Page 38, Lines 8-11, Mr. Lucas recommends a dispute resolution process as outlined in Lucas Exhibit 1. The following questions relate to that exhibit.

**Response: (***For clarity, responses are included in each sub-question below).*

**Name and title of person responding to request:** Tim Dodge, Staff Attorney; Jay Lucas, Utilities Engineer

a. Under proposed Section 6.2.3, if the Parties are unable to resolve the dispute in 20 Business Days, are the Parties able to continue negotiations for an additional 20 Business Days and then, at the end of that extension, contact the Public Staff for assistance? Or are the Parties only able to select one of the options in 6.2.3, for a maximum extension under that section of 20 Business Days?

   The first statement is correct. The Public Staff wishes to encourage Parties to resolve matters informally and without the participation of the Public Staff to the greatest extent possible. If the disputing parties agree to a 20-day extension on negotiations, but are unable to resolve the dispute at that time, they may contact the Public Staff for assistance.

b. Proposed Sections 6.2.3 and 6.2.4 are intended to be mutually exclusive options, correct?

   Yes, the phrase in the alternative is intended to indicate that the two sections are mutually exclusive.

c. With respect to proposed Section 6.2.4, does the Public Staff recommend any accreditation or other similar requirements for the dispute resolution service?

+BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100 SUB 101

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| | ) | NORTH CAROLINA CLEAN |
| In the Matter of | ) | ENERGY BUSINESS ALLIANCE'S |
| Petition for Approval of | ) | RESPONSE TO DUKE ENERGY |
| Generator Interconnection Standards | ) | CAROLINAS, LLC'S AND DUKE |
| | ) | ENERGY PROGRESS, LLC'S FIRST |
| | ) | DATA REQUEST |

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The North Carolina Clean Energy Business Alliance provides the following response to Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP" and, together with DEC, "Duke") First Data Request in this proceeding.

## DEFINITIONS

The following definitions apply throughout the discovery request and are deemed to be incorporated therein:

A. "Document" means all written, recorded or graphic matters, however produced or reproduced, pertaining in any manner to the subject of this proceeding, whether or not now in existence, without limiting the generality of the foregoing, all originals, copies and drafts of all writings, correspondence, telegrams, notes or sound recordings of any type of personal or telephone communication, or of meetings or conferences, committee meetings, memoranda, inter-office communications, studies, analyses, reports, results of investigations, reviews, contracts, agreements, working papers, statistical records, ledgers, books of account, vouchers, bank checks, x-ray prints, photographs, films, videotapes, invoices, receipts, computer printouts or other products of computers, computer files, stenographer's notebooks, desk calendars, appointment books, diaries, or other papers or objects similar to any of the foregoing, however denominated. If a document has been prepared in several copies, or additional copies have been made, and the copies are not identical (or which, by reason of subsequent modification of a copy by the addition of notations, or other modifications, are no longer identical) each non-identical copy is a separate "document."

B. "And" or "or" shall be construed conjunctively or disjunctively as necessary to make the requests inclusive rather than exclusive.

C. The terms "you" and "your" refer to (i) NCCEBA and its respective employees, agents, consultants and witnesses who have provided testimony on behalf of the NCCEBA in the above-referenced proceeding; and (i) specific to NCCEBA Witness Christopher Norqual, Cypress Creek Renewables ("CCR") and its respective employees, agents, consultants.

D. The term "person" means any natural person, corporation, corporate division, partnership, other unincorporated association, trust, government agency, or entity.

looking at the transmission level. While CCR understands that process changes and interdependency concerns can explain some delays in study, it appears excessive that a project could be so delayed that 194 later queued projects would be studied and 100 later queued projects would be interconnected sooner.

1-15. On Page 9 of his direct testimony, Witness Norqual asserts that that "it is my understanding that surety bonds are a widely accepted form of performance security that provide utilities with more than adequate assurance that the financial obligations of Interconnection Customers will be met." Please describe the specific circumstances that have been identified by either CCR or NCCEBA in which surety bonds have been accepted as adequate financial security on behalf of an Interconnection Customer. For all such circumstances identified, please include, at a minimum, the following information:

- The utility or entity accepting the surety bond.
- A copy of the surety bond form accepted.
- If no copy of the surety bond form is available, a summary of the key commercial terms of the surety bond.
- Whether the utility or entity accepting the surety bond prescribed a particular surety bond form to be used.
- The payment or performance obligation for which the surety bond was accepted.

**Response:** Witness Norqual's statement that surety bonds are a widely accepted form of performance security is consistent with FERC's rules and guidelines. *See* FERC Order 2003 (in Docket No. RM02-1-000 issued on July 24, 2003) and FERC Order 2006 (in Docket No. RM02-12-000 issued on May 12, 2005), In FERC Orders 2003 and 2006, the FERC states that the Interconnection Customer has the right to select a form of security that is acceptable to the Transmission Provider and that the Transmission Provider cannot unreasonably refuse to accept a particular form. The FERC further stated that granting the Transmission Provider absolute discretion on what forms of security to allow would provide too great an opportunity to erect hurdles to new generation. Furthermore, Section 11.5 of the Standard Large Generator Interconnection Agreement (LGIA) expressly includes a surety bond as a provision of security for Interconnection Facilities.

This remainder of this response is provided **confidentially** pursuant to the Confidentiality Agreements. [redacted]

[redacted]

1-16. On Page 10 of his direct testimony, Witness Norqual asserts that a typical 115KV transmission interconnected project would have a cash carrying cost to CCR of nearly $1 million. Please provide all documents, written materials, analysis, spreadsheets, and workpapers in the possession of CCR or NCCEBA that support this statement.

**Response:** This response is provided **confidentially** pursuant to the Confidentiality Agreements. [redacted]

- [redacted]
- [redacted]
- [redacted]

1-17. On Pages 10-11 of his direct testimony, Witness Norqual asserts that: "Duke should not be permitted to retain the funds (and frequently substantial funds) of Interconnection Customers for Interconnection Facilities if the Interconnection Facilities are not constructed and Duke has not had to incur any costs." Please identify any instance in which Duke has retained the funds of CCR Interconnection Customers for Interconnection Facilities where the Interconnection Facilities were not constructed.

**Response:** Instances where Duke "has not had to incur" costs could be most directly described as projects having submitted interconnection request deposits that have been on hold due to interdependency for months, if not years.

Instances where "Interconnection Facilities are not constructed" could be most directly described as projects having paid millions of dollars within 60 days of receiving an Interconnection Agreement but a large portion of the actual incurred costs occur months, or years, later. Since such a large portion of costs appears to be tied to the procurement of major and/or long lead materials, the original statement was intended to point out that

Duke could invoice months, or years, later if major outlays of cash were not required until that point in the schedule.

1-18. On Pages 15-16 of his direct testimony, Witness Norqual asserts that ratepayers would benefit from adding energy storage to solar facilities.

a. Please provide all documents, written materials, analysis, spreadsheets, and workpapers in the possession of CCR or NCCEBA that support this statement.
b. In the case of any supporting analysis, please specifically identify the price per KWh that was assumed to have been paid for energy discharged from the battery.

**Response:**

Attached is a report entitled *Energy Storage Options for North Carolina*, which was prepared by the NC State Energy Storage Team for the Energy Policy Council and Joint Legislative Commission on Energy Policy. The website at https://energy.ncsu.edu/storage describes the study as "mandated through the NC General Assembly's authorization language from HB 589 (2017)" and notes that the "final report was submitted to the NC General Assembly on December 3, 2018."

Below are some key statements from the report (with PDF page numbers) which support the statement "that ratepayers would benefit from adding energy storage to solar facilities":

- Under House Bill 589, the NC Policy Collaboratory was tasked with producing a report on the value of energy storage to NC consumers (p.4)
- Energy storage can help ensure reliable service, decrease costs to rate payers, and reduce the environmental impacts of electricity production. (p.4)
- With the continued expansion of solar generation in North Carolina, energy storage used for bulk energy time shifting and peak shaving consistently reduces system-wide carbon dioxide emissions. (p.7)
- Energy storage proves to be more cost-effective with higher solar penetrations because low marginal cost solar can be captured and time shifted. (p.7)
- Voltage Control for High Penetrations of Solar… includes the use of storage to aid voltage control in a distribution system with a high penetration of solar PV. Figure 6.2.5 illustrates an example feeder with various PV units connected to the distribution system. The application of energy storage in this section could involve smoothing the output of an intermittent PV source, absorbing PV output during light loading conditions to reduce voltage, and performing peak shaving. Figure 6.2.6 shows an example feeder that experiences overvoltage due to the addition of PV. The fact that the PV system pushes power towards the substation causes a rise in the circuit voltages. Adding energy storage helps to mitigate the overvoltage issue by charging (adding more load) to counteract the voltage increase caused by PV generation. An

**CERTIFICATE OF SERVICE**

I hereby certify that a copy of the foregoing *Corrected Rebuttal Exhibit JWR-4* – Public Version, filed in Docket Nos. E-100, Sub 101; E-7, Sub 1156; and E-2, Sub 1159 was served electronically or via U.S. mail, first-class postage prepaid, upon all parties of record.

This the 11th day of January, 2019.

*/s/E. Brett Breitschwerdt*
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