

**STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH**

**DOCKET NO. E-100, SUB 101  
DOCKET NO. E-100, SUB 101B**

<b>DOCKET NO. E-100, SUB 101</b>	)	
	)	
<b>In the Matter of Petition for</b>	)	
<b>Approval of Revisions to Generator</b>	)	
<b>Interconnection Standards</b>	)	<b>North Carolina Electric Membership</b>
	)	<b>Corporation’s Responsive Comments</b>
<b>DOCKET NO. E-100, SUB 101B</b>	)	<b>and Presentation</b>
	)	
<b>In the Matter of</b>	)	
<b>Implementation of IEEE Standard</b>	)	
<b>1547</b>	)	

**NOW COMES** the North Carolina Electric Membership Corporation (“NCEMC”) and, pursuant to North Carolina Utilities Commission (“Commission”) Rules R1-7 and R1-19 and in accordance with the *Order Requiring Reports and Scheduling Presentation* issued by the Commission on March 2, 2021 (“March 2 Order”), NCEMC submits the following Comments.

1. In its March 2 Order, the Commission directed Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC (jointly, “Duke”) to file the most recent version of its “Implementation of IEEE Standard 1547-2018 Guidelines” that were developed with stakeholder input via the Technical Standards Review Group (“TSRG”) in Docket No. E-100, Sub 101B on or before March 15, 2021, and annually thereafter. The Commission further directed Dominion Energy North Carolina (“DENC”) to similarly make an annual filing in that docket.

2. The March 2 Order further directed Duke to appear on April 12, 2021 to make a presentation that includes the following elements:
  - a. a brief overview of IEEE Standard 1547-2018;
  - b. a discussion of the standard provisions that Duke has prioritized in order to increase the amount of DER capacity that can interconnect with minimal feeder upgrades, and the status of implementing those provisions;
  - c. a discussion of the standard provisions that would help secure the bulk power system by addressing DER ride-through capability, and the status of those provisions;
  - d. an overview of those IEEE Standard 1547-2018 provisions that are anticipated to require Commission decision-making; and
  - e. any recommendations Duke might have for future stakeholder engagement efforts.
3. In addition, the Commission’s March 2 Order provides that “[t]he Commission will allow NCCEBA, the Public Staff, NCEMC, ElectriCities of North Carolina, Inc. (ElectriCities), and DENC to provide brief responsive comments at the presentation.”
4. By Order issued May 5, 2014, the Commission granted NCEMC’s petition to intervene in Docket No. E-100, Sub 101. NCEMC provides the following update to its attorneys, to whom all communications and pleadings should be addressed are:

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5. Consistent with the March 2 Order, NCEMC requests that the Commission accept as duly filed the comments below. A copy of the slides presented by NCEMC are also included as Attachment A to these comments.

### **Comments**

NCEMC appreciates the opportunity to provide responsive comments on this matter and to participate in the April 12, 2021 presentations. NCEMC and its member cooperatives have been closely involved in the evolution of technical standards related to distributed energy resource (DER) connection and operations on the electric grid. NCEMC has followed the proceedings in Docket No. E-100, Sub 101 and the discussions pertaining to IEEE 1547-2018 Standard, in addition to the impact from FERC and NERC Electric Reliability Organization (EO) compliance requirements.<sup>1</sup> These requirements and standards have been topics of presentations and discussions at state and national cooperative organized technical conferences regularly attended by engineering and operations staff, and the National Rural Electric Cooperative Association (NRECA) has

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<sup>1</sup> See *Requirements for Frequency and Voltage Ride Through Capability of Small Generating Facilities*, Order No. 828, 81 Fed. Reg. 50,290 (Aug. 1, 2016), 156 FERC ¶ 61,062 (2016); *Reform of Generator Interconnection Procedures and Agreements*, Order No. 845, 163 FERC ¶ 61,043 (2018) (“Order No. 845”), *order on reh’g*, Order No. 845-A, 166 FERC ¶ 61,137 (“Order No. 845-A”), *order on reh’g*, Order No. 845-B, 168 FERC ¶ 61,092 (2019).

published numerous articles and guidance documents regarding the IEEE 1547-2018 Standard throughout its development.<sup>2</sup>

The cooperatives acknowledge that each utility, including the distribution cooperatives who are independently governed by their Board of Directors, continue to be solely accountable and responsible for maintaining adequate customer reliability and power quality on its system. Distribution cooperatives have authority, reinforced by FERC and NERC, over the safety and reliability of their systems, and we recognize that DER, when not integrated properly within the distribution system, may negatively impact both, potentially cascading upstream to the transmission system as well. Just as DER deployment on cooperative systems won't take place at a uniform pace, adoption of IEEE 1547-2018 won't be uniform for all of our members – we expect the adoption to reflect the existence and materiality of DER on any system. NCEMC routinely surveys its members on DER installations on their systems and the adoption of new technical standards and guidelines to ensure it has a comprehensive understanding of DER deployment across cooperative systems.

The adoption of IEEE 1547-2018 must consider new and existing installations and the process for requiring compliance with the technical standard (e.g. material modification or termination or expiration and renewal of an Interconnection Agreement). In addition, IEEE 1547-2018 was written to define the capabilities of DER equipment that is intended to be interconnected with the electrical grid and is being incorporated by manufacturers regardless of whether the standard is adopted by utilities or regulatory bodies. Finally, as

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<sup>2</sup> See, e.g., the March 2019 NRECA Guide to IEEE 1547-2018 Standard for DER Interconnections, available online at: <https://www.cooperative.com/topics/transmission-distribution/Pages/NRECA-Guide-to-IEEE-1547-2018-Standard-for-DER-Interconnections.aspx>.

discussed by DENC in its March 15, 2021, status report, the IEEE 1547.1 (testing standard) and related Underwriter Laboratories (UL) 1741 standard that tests to the IEEE 1547 Standard are limited to testing and certifying individual inverters and other DER types.<sup>3</sup> Once these are installed together on the same grid, such as an integrated solar and battery energy storage system, the inverters may collectively respond differently than they did during individual testing and may invoke additional protective requirements by the interconnecting utility to ensure the adequate customer reliability and power quality on its system not currently outlined within the IEEE 1547-2018 Standard.

In addition to hosting technical conferences, NCEMC provides its member cooperatives guidance on DER interconnection and holds regular coordination and planning meetings with its member cooperatives and their respective host utility which include discussion of DER interconnections. NCEMC and its member cooperatives have also collaborated to develop interconnection template documents to facilitate a consistent and coordinated approach for supporting IEEE 1547 adoption. Finally NCEMC and its member cooperatives have also participated in “best practices” discussions with utilities both inside and outside of the North Carolina footprint.

NCEMC continues to engage with member cooperative boards to consider accelerated adoption of IEEE 1547-2018 to require DER to enable remote data acquisition and some level of limited control of the DER output. With increasing DER deployment on their systems, the “smart” capabilities of these resources are paramount to cooperatives in managing their obligation to serve and provide reliable service to their members. As

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<sup>3</sup> DENC Annual IEEE 1547-2018 Implementation Report, filed in this docket on March 15, 2021, Attachment A at 1. Online at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=dcf70c35-0639-4b49-b057-a887626a8085>.

discussed at the March 9, 2021 technical conference in Docket No. E-100, Sub 165, NCEMC and its member cooperatives are embarking on an initiative to create a Distribution Operator focused on reliability coordination.<sup>4</sup> The Distribution Operator must be able to see the resource and understand its impact upon the grid, and then coordinate that impact among the other operational components that work in concert to keep the lights on. This integration provides visibility and coordination to our transmission providers, Duke, DENC, and PJM while maintaining autonomy of the distribution cooperatives. The visibility provided by the Distribution Operator erases a blind spot below the delivery point and the ability to coordinate DER to manage the growing complexity of the grid requests.

To date, neither NCEMC or its members have experienced any operational challenges by distribution-connected energy resources on its system that would have been mitigated by IEEE 1547-2018, but believe that as penetrations of distributed resources continue to increase, the functionality provided through the Standard will help to ensure continued reliability of system. NCEMC and its member cooperatives see certain provisions of IEEE 1547-2018 could provide efficient methods to enable increased visibility and coordination (e.g. site performance monitoring, grid support, and curtailment) to carry out our system reliability responsibility. However, absent IEEE 1547-2018, the cooperatives will continue to maintain reliable electric grids and respond to DER interconnection requests in a timely manner.

NCEMC recognizes value of consistent standards for facilities seeking to interconnect in North Carolina, but believes that the continued informal dialogues that take

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<sup>4</sup> NCEMC presentation in Docket No. E-100, Sub 165, In the Matter of 2020 Biennial Integrated Resource Plans and Related 2020 REPS Compliance Plans,(March 10, 2021), available online at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=3bf463f1-9c02-411f-92a3-6eb918f7070f>

place between the utilities provides an appropriate framework for ensuring that IEEE Standard 1547-2018 is implemented in a reasonable fashion that respects the various resources and characteristics of each utility's system. NCEMC therefore does not believe it needs to be part of the TSRG stakeholder discussions on IEEE 1547-2018, as the TSRG process is focused on technical matters pertinent to interconnection of DER on the DEC and DEP systems, or part of a separate TSRG subcommittee as recommended by NCCEBA at this time.<sup>5</sup>

**WHEREFORE**, NCEMC requests that these Comments be accepted as duly filed.

Respectfully submitted this the 12th day of April 2021.

**NORTH CAROLINA ELECTRIC  
MEMBERSHIP CORPORATION**

By: /s/ Tim R. Dodge  
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<sup>5</sup> See DEC and DEP's Annual IEEE Standard 1547-2018 Implementation Status Report filed in this docket on March 15, 2021, at 2. Online at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=94344b7b-7892-40f6-af72-4f465b854abd>.

**STATE OF NORTH CAROLINA**

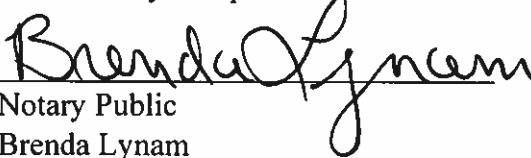
**COUNTY OF WAKE**

Tim R. Dodge, having been first duly sworn, deposes and says:

1. He is Regulatory Counsel for North Carolina Electric Membership Corporation.
2. He has read the foregoing Comments and knows its contents.
3. The matters stated in this instrument are true of his knowledge, except as to those matters that are stated to be on information and belief, and, as to those matters, he believes them to be true.

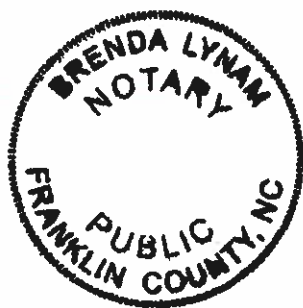
  
\_\_\_\_\_  
Tim R. Dodge

Sworn to and subscribed before me  
this 12th day of April 2021.

  
\_\_\_\_\_  
Notary Public  
Brenda Lynam

My Commission Expires: 11/18/2023

[SEAL]





**CERTIFICATE OF SERVICE**

I hereby certify that the foregoing document has been served upon all parties of record by electronic mail, or depositing the same in the United States mail, postage prepaid.

This the 12th day of April 2021.

/s/ Tim R. Dodge

Tim R. Dodge


**ATTACHMENT A**

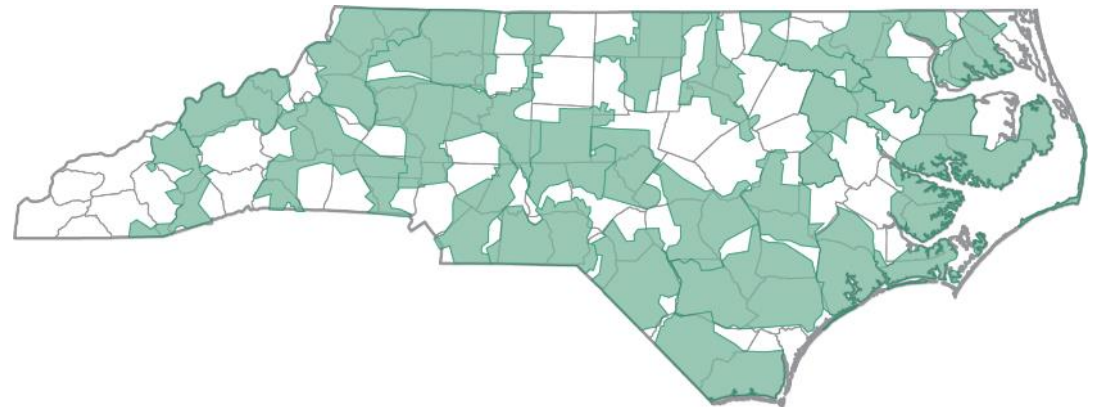
# NCUC Technical Conference on IEEE 1547-2018

- John Lemire, Director of Grid Management, NCEMC
- Tony Eason, Vice President of Engineering and Operations, Pee Dee EMC

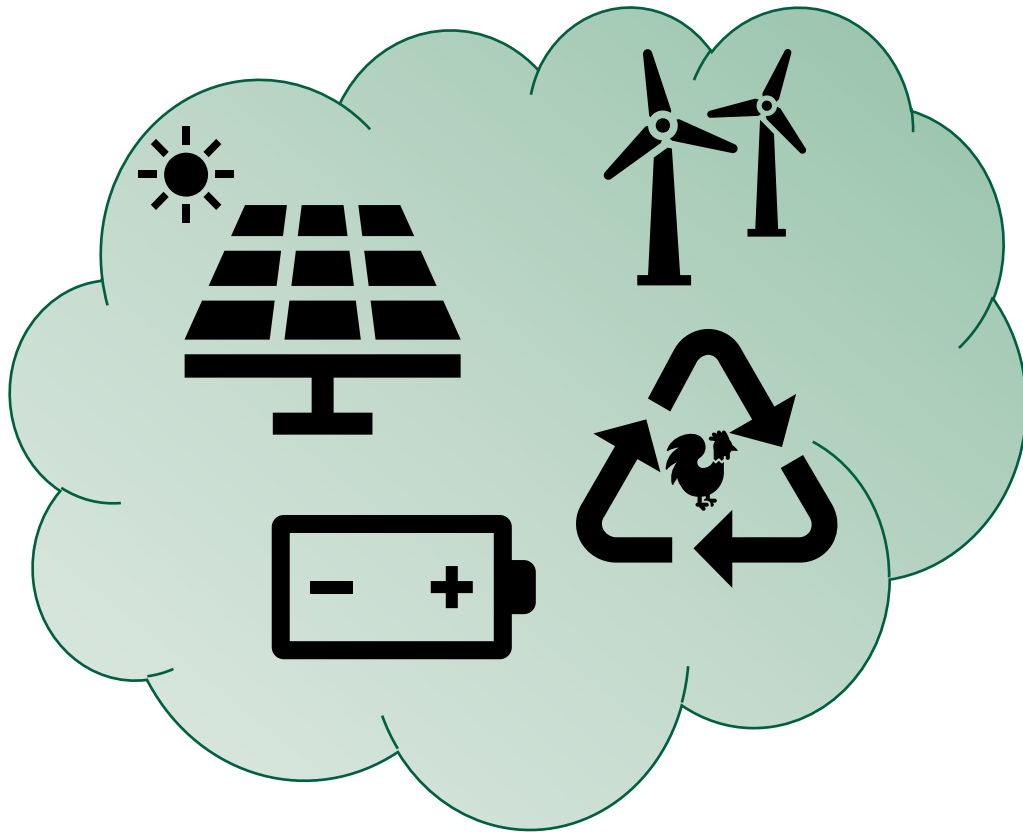


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# Distributed Energy Resources



## NC Electric Co-ops: Over 364 MW of DER

### Solar accounts for 312 MW

	Size	Count
<u>Distribution Connected</u>	<u>237 MW</u>	<u>2,245</u>
Community Solar	2.1 MW	19
Utility Scale Solar	212 MW	92
Residential/C&I connections	23 MW	2,134
<u>Transmission Connected</u>	<u>74.9 MW</u>	<u>1</u>

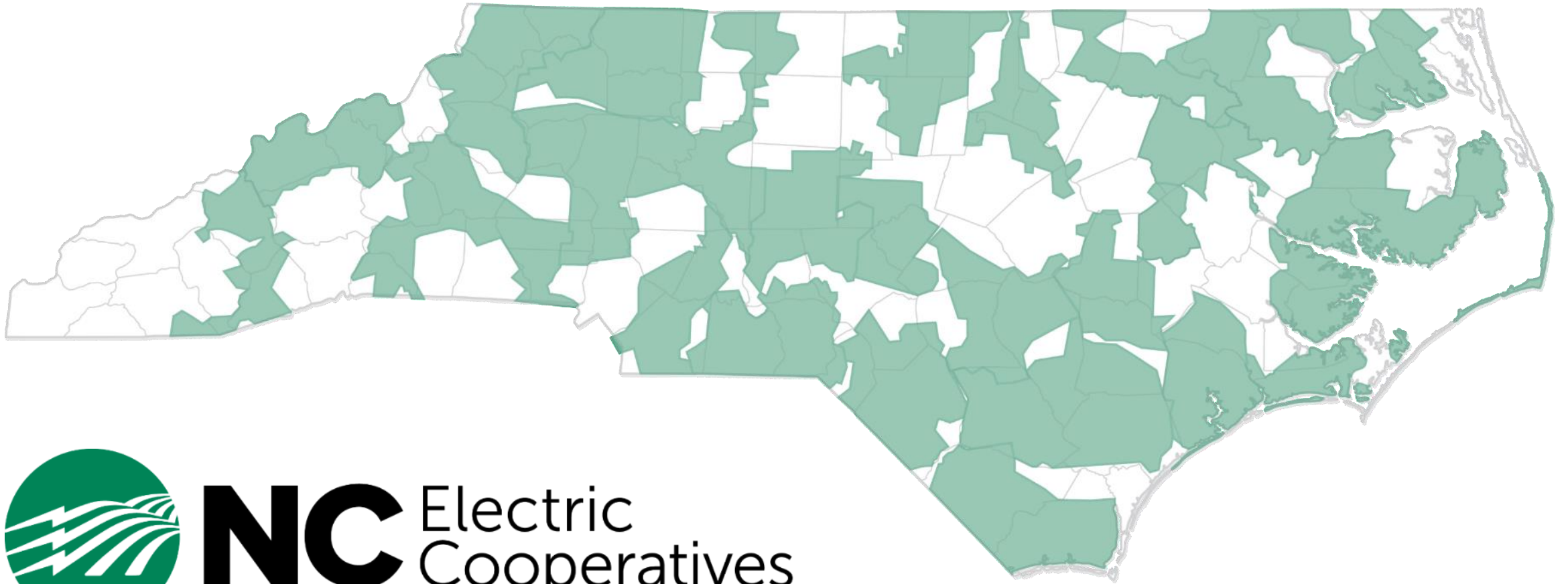
### Other DER accounts for 52 MW

- Biogas Poultry-Swine-Landfill, BESS, Wind, Hydro

# General Themes of Comments:

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- North Carolina's electric cooperatives are fully aware of the standard, and have been engaged in stakeholder discussions and implementation efforts
- Cooperative boards are considering accelerated adoption of IEEE 1547-2018, to require that DER be "smart," recognizing the importance of visibility of resources
- IEEE 1547-2018 implementation is consistent with Distribution Operator (DO) platform reliability service rollout
- Adoption of IEEE 1547-2018 will vary, based on unique circumstances of each system
- Implementation of IEEE 1547-2018 supports distribution system reliability



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