BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-100, SUB 101

In the Matter of:	)	
Petition for Approval of Generator	)	**NCSEA'S INITIAL**
Interconnection Standard	)	**COMMENTS**

NCSEA'S INITIAL COMMENTS

NOW COMES the North Carolina Sustainable Energy Association ("NCSEA") pursuant to the *Order Requesting Comments* issued by the North Carolina Utilities Commission ("Commission") on December 20, 2017 in the above-captioned proceeding, as modified by the *Order Granting Extension of Time* issued on January 22, 2018 and the *Errata Order* issued on January 23, 2018, to provide these initial comments.

On May 15, 2015, the Commission issued its *Order Approving Revised Interconnection Standard* ("2015 Interconnection Order") which, after many months of meetings, negotiations, and filings, adopted a revised Interconnection Standard for use in North Carolina ("2015 Interconnection Standard"). As a part of its 2015 Interconnection Order, the Commission directed the North Carolina Utilities Commission-Public Staff ("Public Staff") to, by no later than May 15, 2017, convene a workgroup of interested parties to determine if the 2015 Interconnection Standard needs revising, and to report any such recommendations to the Commission (herein the "Stakeholder Process").

Pursuant to this directive, the Public Staff convened interested stakeholders to discuss revisions to the 2015 Interconnection Standard. Stakeholders included NCSEA and many of its member companies, including Cypress Creek Renewables ("CCR"), O2 EMC, Coronal Energy, National Renewable Energy Corporation ("NARENCO'), Birdseye Renewable Energy, Renewable Energy and Preservation ("REAP"), Holocene Clean

Energy, Strata Solar, Southern Energy Management, Ollo, Headwaters Solar, KeyTech Engineering, Southern Current, Yes Solar Solutions, Green State Power, Watson Electrical, Carolina Solar Energy, Community Energy Solar, Cooperative Solar, Pine Gate Renewables, Solterra Partners, Sundance Power Systems, Double Time Capital, Hannah Solar, Carolina Solar Services, Ecoplexus, GreenGo Energy ("GGR"), Geenex Solar, United Renewable Energy, Parker Poe, Heelstone Energy, E8 Energy Group, SMA Solar Technology AG, Apex Clean Energy, Nelson Mullins Riley & Scarborough, CohnReznick, and NC Solar Now.

Duke Energy Carolinas, LLC ("DEC"), Duke Energy Progress, LLC ("DEP") (collectively, "Duke"), Virginia Electric and Power Company ("Dominion"), the North Carolina Electric Membership Corporation, and ElectriCities of North Carolina, Inc. all participated in the process as well. Finally, the Interstate Renewable Energy Council, Inc. ("IREC") also participated in the Stakeholder Process.

Pursuant to the Commission's directive, on December 15, 2017, the Public Staff filed a report on the activities of the Stakeholder Process ("Working Group Report").[1] NCSEA submits these initial comments to the Commission regarding the Working Group Report, as well as to provide situational context for the Stakeholder Process.

[1] The Working Group Report is itself a redlined version of the 2015 Interconnection Standard. Due to the changes proposed to the 2015 Interconnection Standard and the sidebar comments that are included, some pages in the Working Group Report are numbered and some are not. To avoid confusion, in these comments NCSEA will cite to pages in the PDF that was filed with the Commission, rather than the page numbers that appear in the text of the Working Group Report.

I. <u>HISTORICAL CONTEXT OF CURRENT STAKEHOLDER PROCESS.</u>

A. <u>PURPA.</u>

The Public Utilities Regulatory Policies Act ("PURPA"), enacted as part the National Energy Act of 1978, was designed to combat a nationwide energy crisis by encouraging conservation of oil and natural gas and promoting the development of alternative energy resources. One of the stated goals of PURPA and its implementing regulations is to encourage the development of small power production facilities with renewable fuel sources, such as solar energy. 16 U.S.C. § 824a-3; *Am. Paper Inst., Inc. v. Am. Elec. Power Serv. Corp.*, 461 U.S. 402, 405 n.1 (1983).

Section 210 of PURPA obligates electric utilities to purchase the energy and capacity produced by cogeneration facilities and small power production facilities that meet the requirements of PURPA Section 201 ("Qualifying Facilities" or "QFs"). PURPA regulations also obligate interconnecting utilities to "make such interconnection with any qualifying facility as may be necessary to accomplish purchases or sales under" PURPA. 18 C.F.R. § 292.303(c).

Pursuant to Federal Energy Regulatory Commission ("FERC") regulations and Orders, this Commission has supervisory jurisdiction over the interconnection of qualifying facilities to utilities, and over the calculation of interconnection costs for such interconnection. 18 C.F.R. § 292.306; FERC Order 2003 (stating that state utilities commissions have jurisdiction over interconnection of QFs selling all output to interconnecting utility). Utilities are also required by PURPA to provide QFs nondiscriminatory access to its grid so that such sales can be accomplished. This Commission is required by state and federal law to supervise and establish the standards for the interconnection of such projects. The Commission approved the currently operative Interconnection Standard in 2015.

Although many QFs have interconnected to the utilities' grids over the past decades, hundreds of other projects that have submitted interconnection requests are currently awaiting study by utilities, which maintain absolute control over the interconnection process in their service territories. Duke, in particular, has failed to process these requests in a timely fashion in accordance with the Interconnection Procedures, and many projects have been languishing in the queue for months or even years past the time when they would have achieved interconnection if Duke had complied with its legal obligations.

B. THE NORTH CAROLINA INTERCONNECTION PROCEDURES.

N.C. Gen. Stat. Section 62-133.8(h)(i)(4) requires this Commission to establish "standards for interconnection of renewable energy facilities and other nonutility-owned generation with a generation capacity of 10 megawatts or less to an electric public utility's distribution system[.]"

The current 2015 Interconnection Standard was approved by the Commission on May 15, 2015 after an extensive review of the prior interconnection standards, which had been adopted in 2008. This process involved numerous stakeholders, including Duke, industry representatives, the Public Staff, and other interested parties. In its order adopting the 2015 Interconnection Standard, the Commission directed the Public Staff to convene a new Stakeholder Process in 2017 to examine whether changes to the 2015 Interconnection Standard were necessary.

1. Independent Solar Power Development in North Carolina

The state of North Carolina has experienced significant growth in the solar industry in recent years. As of December 2017, approximately 3,250 megawatts ("MW") of solar electric energy capacity is now on the grid in North Carolina, including approximately 2,500 MW in Duke's and 540 MW in Dominion Energy's North Carolina service territories. As of 2016, the renewable energy industry in North Carolina had created approximately 34,300 jobs in the state. Approximately $12 billion was directly spent on clean energy development in North Carolina between 2007 and 2016. As a result of changes in economic activity from the development of clean energy in North Carolina, state and local governments realized tax revenue of $1 billion between 2007 and 2016. Notwithstanding this rapid growth, according to the U.S. Energy Information Administration non-hydroelectric renewable generation currently represents only about 6.4% of the annual electricity generated in North Carolina.

In addition to the solar energy resources already operating, a significant number of solar projects are under development in North Carolina. According to the latest Interconnection Queue Status Reports, (filed in North Carolina Utility Commission Docket No. E-100, Sub 101A), Duke reported that approximately 2,722 MW of proposed projects were pending in DEC's and DEP's interconnection queues at the end of December 2017 and Dominion Energy North Carolina had approximately 361 MW (excluding net metering) pending in its interconnection queue at the end of October, 2017.

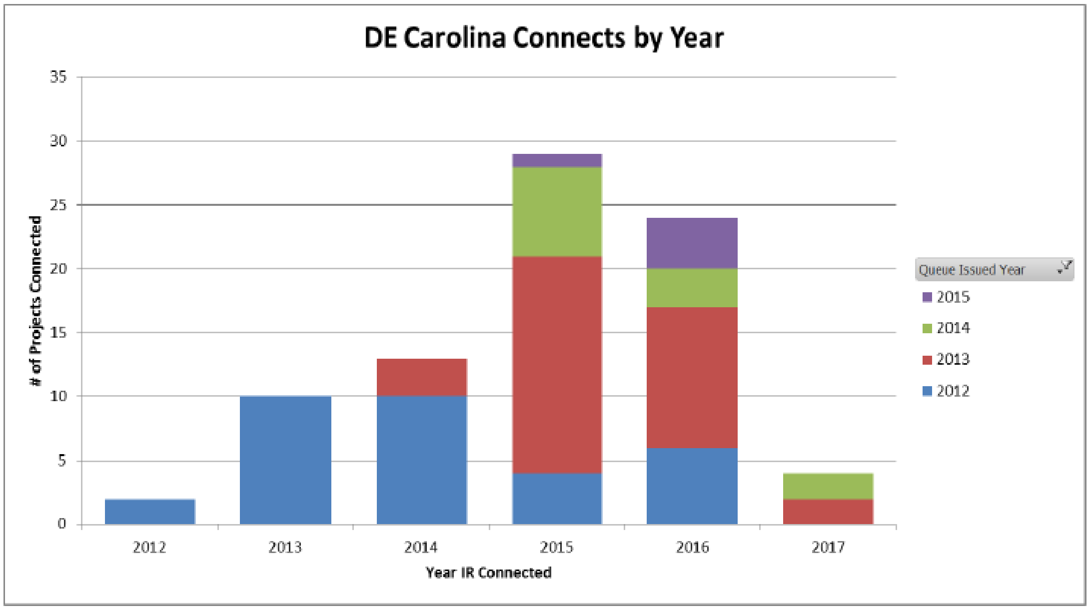
During this period of rapid development, Duke and Dominion have been unable to meet their obligations to timely interconnect QFs to the power grid in compliance with the Interconnection Procedures. Despite the Commission's substantial revisions of the

Interconnection Procedure in 2015, which were intended to promote more efficient and timely processing of interconnection requests, Duke has fallen further behind on its obligations and a decline in the number of interconnection requests filed each year since 2014.

The format of Duke's Quarterly Interconnection Queue Performance Reports makes it difficult to quantify Duke's queue performance. However, parsing through its most recent reports shows that Duke's performance in both DEC and DEP territories is abysmal. According to those reports, during Q4 2017 the time it took for most projects in DEP territory to progress from interconnection request to issuance of an Interconnection Agreement was between 540 and 629 days, with some issuances taking more than 990 days. In DEC, no projects were issued interconnection agreements in Q4 2017. In fact, through Q4 2017, DEC hadn't interconnected a single project whose interconnection request was submitted later than 2015. Overall, DEC and DEP only connected half the number of projects 2 MW or larger in 2017 connected in 2016. This decline was especially steep in DEC territory despite having 1,340 MW of projects waiting to be interconnected. Below see graphs presented by Duke in Docket No. E-100, Sub 101A reflecting yearly interconnections by year of queue issue.

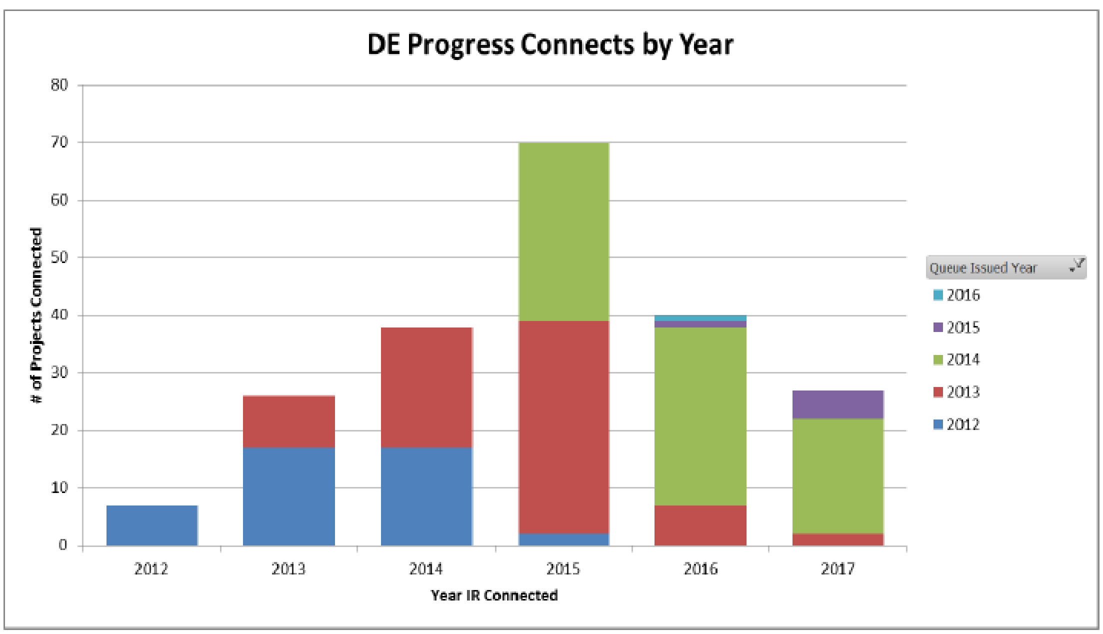
Interconnection Queue Performance

DUKE ENERGY

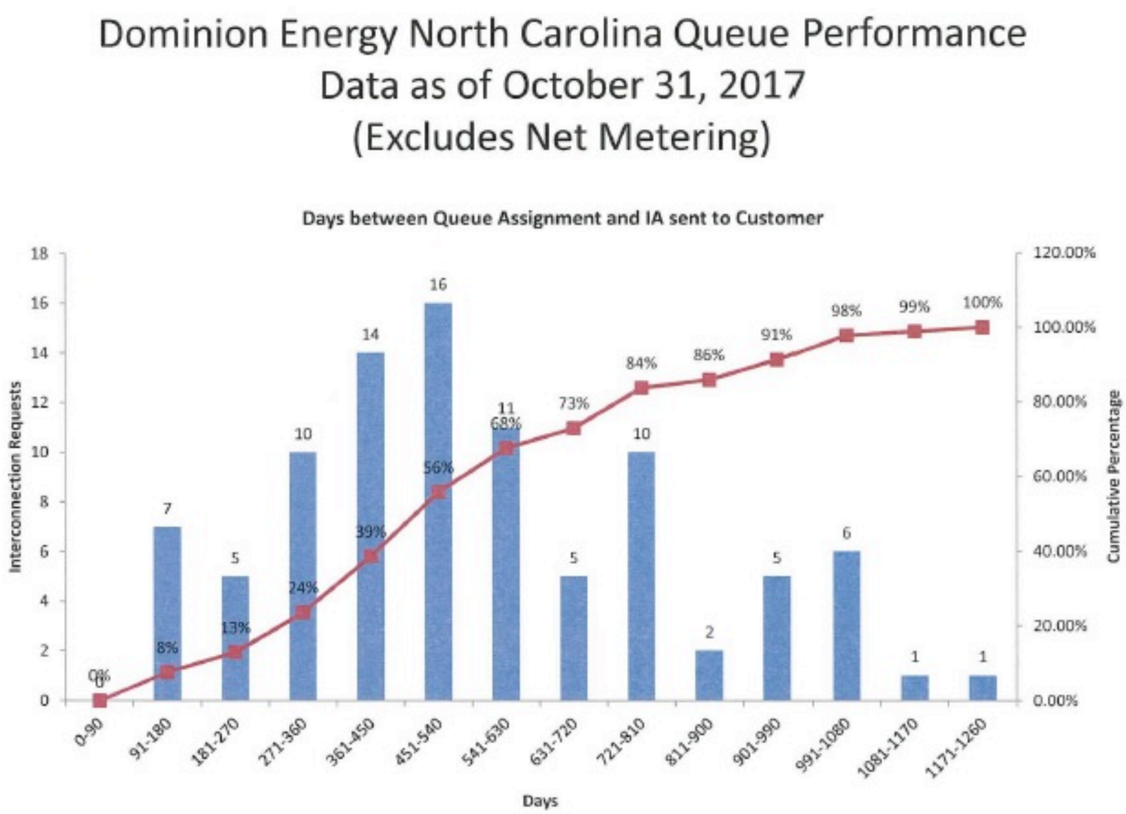


Interconnection Queue Performance

DUKE ENERGY



Dominion has not fared much better according to the data filed in its Quarterly Interconnection Queue Performance Reports. From November 2, 2015 to October 28, 2016 twenty six projects were interconnected compared to only thirteen from October 29, 2016 to October 31, 2017 and 361 MW worth of projects in the interconnection queue. As of October 31, 2017, most projects (excluding net metering) have taken over 451 days to progress from interconnection request to issuance of an Interconnection Agreement. Below see Dominion's queue performance graph data submitted in Docket No. E-100, Sub 101A.



2. RECENT CHANGES TO THE REGULATION OF INDEPENDENT POWER PRODUCTION IN NORTH CAROLINA.

In recent years, Duke has alleged that the PURPA-driven development of independent solar energy facilities in North Carolina is problematic. Duke has claimed that the current level of solar development, particularly in DEP's territory, presents challenges to the reliable operation of the grid and has resulted in increased costs for ratepayers. Duke has therefore sought and obtained significant changes to North Carolina's regulatory regime to discourage the development of PURPA projects in North Carolina. The most significant recent regulatory changes are contained in S.L. 2017-192, variously referred to as the "Competitive Energy Solutions for North Carolina," the "Distributed Resource Access Act," or (more commonly) "H.B. 589." H.B. 589 was enacted by the General Assembly on June 30, 2017, and signed by Governor Cooper on July 27, 2017. H.B. 589 was the product of protracted negotiations among various stakeholders, including NCSEA, and their advocates in the General Assembly, and represented a significant compromise by the solar industry.

With support for its solar provisions from NCSEA and many of its members, H.B. 589 effected a number of changes to PURPA implementation long sought by Duke. These include: (1) reducing the eligibility cap for standard offer rates and contracts from 5 MW to 1 MW, and then (after 100 MW of new capacity contracts under those rates) to the PURPA minimum of 100 kW; (2) reducing the maximum duration of PURPA standard-offer contracts from 15 years to 10; (3) changing the calculation of capacity payments under PURPA to eliminate capacity payments in years where Duke does not project a need for capacity; and (4) requiring Duke to calculate rates for negotiated PURPA contracts "consistent with the most recent Commission-approved avoided cost methodology for a fixed five-year term." The net effect of these changes is to make most new PURPA projects in North Carolina unfinanceable.

In lieu of purchasing additional power from QFs via traditional PURPA contracts, H.B. 589 requires Duke to conduct competitive solicitations for 2,660 MW of renewable generation over the 45 months after the effective date of the law. Duke and its subsidiaries are allowed to submit their own projects for consideration in the solicitation, and Duke may satisfy up to 30% of its procurement obligation through its own self-developed projects. In addition, without regard to this limitation, Duke may acquire, construct, own, and operate projects developed and successfully proposed by third parties.

H.B. 589 codified an assumption that significant development of PURPA projects already in process would still go forward. The 2,660 MW Duke is obligated to procure through the competitive solicitation is subject to adjustment depending on how much capacity Duke acquires from other sources during the 45-month solicitation period. Specifically, if Duke has contracted for more than 3,500 MW of non-dispatchable capacity outside of the competitive solicitation and other programs specifically authorized by H.B. 589, then the aggregate procurement requirement will be reduced by the amount of the exceedance. But if Duke contracts for less than 3,500 MW through those other sources, it must conduct an additional competitive procurement to make up the deficit, a competitive procurement of which 30% can be awarded to Duke.

Interconnection is key to many recent changes to the regulation of independent power production in North Carolina. As noted by Chairman Finley, the interconnection "docket is interrelated to other dockets like the implementation of House Bill 589, and avoided cost, and IRP, and all of that stuff, so it's sort of a stumbling block we've got to address." *Staff Conference Transcript for September 18, 2017*, p. 11, Docket No. M-1, Sub 7 (October 5, 2017). Failure to appropriately revise the 2015 Interconnection Standard could have impacts in numerous other proceedings.

II. THE 2017 INTERCONNECTION STAKEHOLDER PROCESS.

The Stakeholder Process directed by the Commission in its 2015 Interconnection Order was intended to determine whether and in what respects the current North Carolina Interconnection Procedures may need revising. Numerous revisions to the Interconnection Procedures have been proposed by parties to the Stakeholder Process. Of note, however, is that Duke's proposed revisions would result in a loosening of existing deadlines for processing of interconnection requests.

In an effort to understand the root causes of Duke's consistent failure to meet its timeline interconnection processing obligations, NCSEA and other parties to the Stakeholder Process requested that Duke provide detailed information concerning the time it was taking DEC and DEP to move projects through each stage of the interconnection process. Duke initially agreed to provide such information, stating that it could generate that information easily. But Duke subsequently refused to provide the requested information, claiming that developing this information "is not the best use of the Duke study team's time."

Another topic of discussion in the Stakeholder Process has been Duke's history (discussed further below) of unilaterally implementing changes to its interconnection policies that significantly impact projects already in-queue, and Duke's overall lack of transparency with regard to such policies. One suggestion advanced by the solar industry has been for Duke to submit significant changes to its technical standards for review and discussion with a stakeholder group including industry representatives. Duke initially entertained, but ultimately declined, suggestions to establish such a process for *future* interconnection screens, but steadfastly refused to submit any *current* policies to such review.

A. <u>THE PROCESS.</u>

Throughout the Stakeholder Process, NCSEA attempted to be a constructive and productive participant. Before the Stakeholder Process even began, NCSEA partnered with the North Carolina Clean Energy Business Alliance ("NCCEBA") to survey our members about issues related to the current Interconnection Procedures and interconnection queue performance that were the most pressing to them. The results of this survey are shown in *Exhibit 1* attached hereto and incorporated herein and entitled Interconnection Stakeholder Process presentation prepared by NCCEBA and NCSEA which was presented to the full stakeholder working group on June 1, 2017. The survey results made clear that NCSEA and NCCEBA members' primary concerns were related to delays in the interconnection study process followed by communications with the utilities and their responsiveness, engineering screens, transparency, time taken to construct upgrades, and material modifications.

Based on the member survey, NCSEA compiled an initial list of items that it (and its members) wanted to be discussed in the Stakeholder Process and submitted the list to the Advanced Energy facilitators. In their facilitation of the Stakeholder Process, the Public Staff and Advanced Energy understandably decided to group similar issues raised by various participants into working groups. Originally, these four working groups consisted of:

- Working Group #1: Transparency/Communication/Conflict Resolution/Fees
- Working Group #2: New Technologies
- Working Group #3: Studies and Screens
- Working Group #4: Queue Management, Certification of Generating Facilities

Shortly after these working groups were proposed, Working Groups 3 and 4 were combined due to the many overlapping issues. Advanced Energy then solicited volunteers from the participants in the Stakeholder Process to lead these smaller working groups outside of the full Stakeholder Process meetings. Working Group 1 meetings were organized by the Public Staff, Working Group 2 meetings were organized by IREC, and Working Group 3-4 was organized by Duke. In addition to these working group meetings, there were a few specialized meetings that were organized to discuss topics related to:

- H.B. 589's mandate for an expedited review process for interconnecting swine and poultry waste-to-energy projects;
- Fast-Track and Supplemental Review process; and
- Changes that constitute "Material Modifications" to the Interconnection Request.

B. WORKING GROUP 1: TRANSPARENCY, COMMUNICATIONS, CONFLICT RESOLUTION, AND FEES.

In its initial list of issues, NCSEA raised questions related to transparency, communication, conflict resolution, and fees, all of which were relevant to the subject matter of Working Group 1. Specifically, NCSEA raised the following questions and issues:

1) What can be done by the utilities (and all relevant parties) to improve the transparency of data? Relatedly, what data can the utilities make available to project developers that would allow developers to better evaluate the viability of a project prior to submitting an interconnection application?

2) Do the utilities have the data to identify locations on the grid where distributed generation can be beneficial? If so, are the utilities willing to share this data? Why or why not?

3) A related, larger picture issue: what can be done to improve communication between the utilities and project developers? Specific sub-issues and questions to this topic include:

   i. How are utilities held accountable for failures to communicate with project developers?

   ii. The question of overall responsiveness by utilities to communications from project developers;

   iii. Utility accounting of deposits from project developers and timely issuance of refunds as necessary by the utility;

   iv. Can the utilities utilize a website or online portal to allow for the project developers to check the status of their projects?

Finally, regarding how to mediate the issues between the interested parties:

4) Are the conflict resolution procedures working as they should? For project developers? For utilities? For the Public Staff?

The desire for a technical working group to examine the imposition of new screening requirements, as noted above, was discussed by the participants in Working Group 1. Initially, some consensus was reached with the utilities regarding the need for a technical working group ("TWG"), but specific language was not agreed upon. One of the barriers was disagreement about the potential imbalance of power within such a technical working group between utilities and other stakeholders and what effect(s) such an imbalance may have. Some of the questions and issues related thereto included:

1) Would the TWG be able to reject screens? Could utility adopt a screen even if TWG rejected it? How would an appeals process work? None of this was ultimately resolved in the Stakeholder Process discussions.
2) Some consensus was reached with utilities, however, regarding the need for a consistently updated interconnection requirements document that summarizes requirements not clearly identified in the interconnection standard.
3) No consensus was reached regarding the issue of greater accountability for utilities or for penalties for utilities that fail to meet deadlines or other responsibilities and requirements outlined in the interconnection standard.

Despite NCSEA's repeated attempts to raise this issue of utility accountability, it was never substantively discussed due to the refusal by utility representatives to consider a proposal that would correct the imbalance of accountability between utilities and interconnecting customers for failing adhere to requirements under the Interconnection Procedures. Prior to the August 3, 2017 transparency working group, NCSEA submitted a list of suggested edits to existing interconnection procedures to help increase transparency by defining deadlines for utilities to provide deliverables to interconnecting customers. These NCSEA transparency suggestions are noted in the Redline of Working Group Recommendations submitted by the Public Staff on December 15, 2017 and are attached hereto and incorporated herein as *Exhibit 2*.

4) Late in the process, Duke unveiled a proposal to significantly increase interconnection fees. Developers opposed these increases in the absence of a clear commitment that these fees would improve the interconnection queue.

Duke's rationale for the new fees, particularly for customer-sited systems, is based on flawed assumptions. Duke assumes that interconnection requests for customer-sited systems will not increase in coming years, and thus Duke's overhead costs for interconnection should be spread across a stable number of interconnection requests.

However, Duke's assumptions are at odds with the provisions of H.B. 589, which opened the market for leasing customer-sited solar systems. Further, H.B. 589 also directed Duke to offer rebates for a total of 100 MW of customer-sited solar in North Carolina. These provisions, and the underlying legislative intent of H.B. 589, suggest that Duke should see an *increase* in the number of interconnection requests for customer-sited solar, and thus their fixed overhead costs should be spread across a larger pool, leading to smaller pro rata costs.

C. WORKING GROUP 2: NEW TECHNOLOGIES.

In its initial list of issues, NCSEA raised questions related to the deployment of technologies that are substantially more prevalent and feasible since the last time the Commission adopted these Interconnection Procedures, all of which were relevant to the subject matter of Working Group 2.

Specifically, NCSEA raised the following questions:

1) Does the interconnection standard make the best use of the services that can be provided by inverters?
2) Can inverters be better utilized to address issues of in-rush after re-energization?

3) How will Duke's grid modernization plan allow for increased deployment of distributed generation?

During the pendency of this Stakeholder Process, Duke touted how the supposed grid modernization plan known as "Power/Forward" ("P/F") would allow greater renewable energy penetration but failed to provide specific details related to such penetration. However, it came to light during the DEP general rate case that the P/F proposal would accommodate H.B. 589's requirements and nothing more.[2]

4) Should interconnection deposits be reduced in light of Duke's expected investment in the grid?

5) Does the interconnection standard make the best use of the services that can be provided by distributed generation?

6) How does the interconnection standard interact with other utility planning processes, such as integrated resource planning?

During the DEP rate case, it became apparent that DEP and DEC engage in integrated distribution planning. This type of planning (and the data related thereto) could and would be very valuable to distributed generation. However, this would only be valuable if such data is shared.

During the meetings for Working Group 2, the participants reached a general consensus that the discussion around energy storage and smart inverters didn't result in the need for many specific updates to the language in the interconnection standard at this time. Based on these discussions, NCSEA, IREC, and CCR submitted language to address the maximum generating capacity of facilities that employ new technologies such as energy

[2] See generally Docket No. E-2, Sub 1142, cross examination of Robert Simpson, III (November 29, 2017), Tr. 9, beginning on p. 12.

storage. *See* NCSEA, IREC and CCR Working Group 2 Suggestions attached hereto and incorporated herein as *Exhibit 3*.

Duke and Dominion wanted language regarding "mutually agreed upon" limits to the gross generating capacity of the facility. IREC, NCSEA, and CCR raised concerns that this language could explicitly limit control devices to those approved by the utilities and could effectively limit facilities to only being able to employ physical control devices, which is unnecessarily restrictive with today's technology.

D. WORKING GROUPS 3 AND 4: STUDIES, SCREENS, QUEUE MANAGEMENT, AND CERTIFICATION OF GENERATING FACILITIES.

In its initial list of issues, NCSEA raised questions related to Duke's interconnection screens, the "clogged" interconnection queue in both Duke and Dominion territories, and possible solutions to reduce delays in the interconnection process, all of which were relevant to the subject matter of Working Groups 3 and 4.

Specifically, NCSEA raised the following questions:

1) Are the engineering screens and requirements that have been unilaterally imposed by Duke justified? If so, should they be added to the interconnection standard and how?
2) Is the Circuit Stiffness Review threshold set at the appropriate level?
3) Is the Line Voltage Regulator screen impacted by the P/F proposal?
4) If additional engineering screens are necessary in the future, how should those be implemented? What Commission oversight should be necessary?
5) Because of the imposition of these screens and requirements, do the stakeholders really know whether the current interconnection standard is not working?

6) Are structural changes to the interconnection queue necessary? Sub-issues and questions to this issue include:

   i. Should separate interconnection queues be established for poultry and swine waste projects?

   ii. Should a separate interconnection queue, with an expedited review process, be established for projects under 1 MW in capacity (regardless of whether a system is net metered or sell-all)?

   iii. Should the distribution and transmission queues be merged?

   iv. Should cluster studies be adopted? If so, how should upgrade costs be divided among projects in the cluster?

7) Are the construction standards and post-construction review unilaterally imposed by Duke justified? If so, should such standards and review be added to the interconnection standard and how?

8) What changes can be instituted to identify projects, earlier in the process, that will have economically prohibitive interconnection costs, or other flaws that would render a project unfeasible? This could also include feasibility studies or pre-application meetings between the relevant parties to determine such issues.

9) What can be done to reduce delays in the interconnection process? What can give project developers certainty about when they will receive study results? Some related sub-issues and questions include:

   i. Do the deadlines in the interconnection standard need to be changed? For utilities? For project developers?

ii. What can be done to require the utilities meet the deadlines in the interconnection standard? How are the utilities held accountable if they fail to meet deadlines? Are penalties necessary for utilities that fail to meet deadlines?

iii. What can be done to require project developers to respond to utility inquiries in a timely manner?

10) Are the utilities properly staffing their interconnection groups? Relatedly:

i. If more staffing is necessary - are project developers willing to pay larger deposits to allow for increased staffing?

ii. Are outside engineers/consultants necessary?

11) How do delays in the interconnection process impact other proceedings? How do other proceedings impact the interconnection process?

i. Also, specifically, are changes to the 30-month rule necessary because of the delays in interconnection studies?

12) Should there be a requirement that additional material modification language be added to engineering drawings?

13) Is a utility's refusal to allow project developers access to their poles for feeders a good utility practice?

14) What can be done to ensure that the utility constructs upgrades in a timely manner?

Most of the issues raised by NCSEA about existing and recently proposed engineering screens weren't addressed in this Stakeholder Process. NCSEA and its member companies repeatedly tried to address the substantial delays interconnecting customers are experiencing in the interconnection queue, but the utilities refused engage in a substantial discussion during this Stakeholder Process. Utility representatives claimed that delays in the interconnection queue were due to the limited amount of staff available to handle the number of projects waiting to be interconnected. The utilities largely did not offer or engage in a discussion on ways the Interconnection Procedures could be updated to help reduce these substantial delays.

Despite having met at least four times, the combined Working Group 3 and 4 meetings did not adequately address many of the issues around queue performance and interconnection delays, including many of those listed above. NCSEA and interconnecting customers who participated in this working group were not left with a sense of clear steps the utilities are taking to improve queue performance.

E. SPECIALIZED WORKING GROUPS.

The pertinent specialized working group issues are set forth below:

1. INTERCONNECTION OF SWINE AND POULTRY RESOURCES.

The issue of interconnection of swine and poultry resources has previously come up in front of the Commission. The Pork Council previously filed a motion with the Commission regarding interconnection queue priority. Furthermore, NCSEA and the Public Staff had both raised it as an issue at the beginning of the Stakeholder Process, prior to the implementation of H.B. 589.

NCSEA supports the Public Staff's proposal which was agreed to by the Public Staff, NCSEA, the Pork Council, the Poultry Federation, and Duke.

2. FAST TRACK INTERCONNECTION.

NCSEA supports IREC's proposal and recommendation to the Commission regarding fast tract interconnection.

III. COMMENTS ON TOPICS IN THE WORKING GROUP REPORT.

The report submitted on December 15, 2017 by Advanced Energy, known herein as the "Working Group Report", showed a robust discussion between the utilities and stakeholders on various issues related to interconnection policies and procedures. As set forth herein, NCSEA's position was made clear within many of its comments and has been further crystallized below. NCSEA's failure to discuss any proposed change made in the Working Group Report should not be construed as support of such a proposed change.

A. DELAYS AND TIMING.

During the Stakeholder Process, NCSEA proposed various changes that would create more stringent requirements for utilities to respond in a timely manner. *See generally*, Working Group Report, pp. 7, 28, 50, and 97; *see also Exhibit 2*. It is abundantly clear that the utilities are not abiding by the time requirements contained in the Interconnection Standard. *See generally*, Docket No. E-100, Sub 101A (interconnection queue reports); see also queue reports for DEC, DEP, and Dominion embedded herein in Section I.

Despite their failure to adhere to the requirements of the current Interconnection Standard, and initially agreeing to share such information, Duke ultimately stated that providing information about actual timing was not "the best use of the Duke study team's time." See Emails between Peter Ledford and Brett Breitschwerdt dated October 30, 2017 attached hereto and incorporated herein as *Exhibit 4*.

In response to one of NCSEA's suggestions, Dominion noted that the need for the proposed language was unclear to them. Working Group Report, p. 7, Comment [A4]. NCSEA verbally explained the rationale for its suggestion at the August 3, 2017 Working Group 1 meeting focused on transparency, and certainly could have provided more in-depth information if the utilities had been willing to engage in a discussion about delays in the interconnection process.

The refusal of the utilities to discuss delays in the interconnection process did not stop them from proposing to tighten timing requirements for Interconnection Customers or loosening timing requirements for utilities. Duke recommended that Interconnection Customers be required to provide the utility with any requested information or documentation within ten business days. Working Group Report, p. 41, Comment [A71], p. 104, Comment [A144], and p. 113, Comment [A147]. NCSEA recognizes that such a requirement may be necessary, and raised in its initial issues list the issue of whether deadlines for Interconnection Customers need to be strengthened. *See* NCSEA's Issues by Working Group Discussed attached hereto and incorporated herein as *Exhibit 5*.

Dominion also recommended shortening the timeframe for an Interconnection Customer to provide "Payment and Financial Security for Upgrades and Interconnection Facilities" to the utility. Working Group Report, p. 46, Comment [A85]. Relating to the timing of the utility's obligations, Duke recommended giving utilities additional time to hold a scoping meeting with an Interconnection Customer. Working Group Report, p. 42, Comment [A74]. While these proposals may have merit, NCSEA cannot support them without a full discussion of timing and delays, which the utilities were unwilling to have as a part of the Stakeholder Process. As such, NCSEA recommends that the Commission reject these suggestions.

In the absence of a substantive discussion of both timing and delays, NCSEA cannot support either the tightening of deadlines for Interconnection Customers or the relaxing of deadlines for utilities. Furthermore, because of the utilities' refusal to engage on these issues, NCSEA supports GGE's recommendation that an independent auditor evaluate the utilities' compliance with the Interconnection Standard's deadlines. Working Group Report, p. 45, Comment [A82].

B. INTERCONNECTION FEES.

Pursuant to direction provided by the Public Staff and Advanced Energy, all proposed revisions to the Interconnection Standard were to be submitted by stakeholders on or before November 13, 2017 However, Duke provided stakeholders with proposed changes to interconnection fees after the final Stakeholder Process meeting and after the November 13, 2017 date set by the Public Staff and Advanced Energy.

Specifically, Duke proposed raising the fee for a Pre-Application report from $300 to $500 (Working Group Report, p. 7, Comment [A5], [A6])[3]. No justification was provided for this proposal, and as such, NCSEA cannot support it. NCSEA endorses the comments provided by Yes! Solar Solutions (pp. 100-101) and IREC (pp. 101-102) regarding Duke's untimely proposed fee changes.

Duke further proposed adding language to require an interconnection customer's deposit cover not only the utility's anticipated costs, but also "overheads." Working Group

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[3] See also Comments [A109] to [A116], pp. 65-66 of Working Group Report; Comment [A128], p. 81 of Working Group Report; Comments [A135] and [A136], p. 88 of Working Group Report regarding other suggested fee increases from Duke.

Report, p. 16, Comments [A20] and [A21]. NCSEA notes that no justification was provided by Duke in support of this proposal, and as such, NCSEA cannot support it. NCSEA further notes that, per Orders filed in E-7, Sub 1106 on August 16, 2016 and E-2, Sub 1109 on January 17, 2017, interconnection fees are already intended to cover the utilities' overhead costs, and fails to see why the addition is necessary.

C. TRANSPARENCY OF DATA AND INFORMATION.

From the beginning of the Stakeholder Process, NCSEA sought to increase transparency so that interconnection customers will be able to know generally whether a project is viable without the need to file an interconnection application. See NCSEA's Issues by Working Group Discussed attached hereto and incorporated herein as *Exhibit 5*.

NCSEA proposed language that would make data included in a Pre-Application Report more publicly available, with the goal of allowing interconnection customers to self-select whether a project is viable without the need to enter the interconnection queue. Working Group Report, p. 8, Comment [A12]. In December, after the conclusion of the Stakeholder Process, Dominion stated that this information is considered sensitive and confidential. NCSEA would welcome a discussion in hopes of finding a middle ground where non-confidential information could be made publically available with the goal of reducing the number of unviable interconnection applications.

IREC shared recommendations to improve transparency of data and information. In particular, IREC recommended that the utilities provide hosting capacity maps, as is done in other states. Working Group Report, pp. 10-11. NCSEA supports IREC's proposal.

Further, NCSEA would advocate that the development of internet-based services should be a subject of discussion for all stakeholders, rather than just utilities, as was suggested by Dominion. Working Group Report, p. 10, Comment [A18].

D. <u>REPORTING.</u>

IREC proposed a requirement that the utilities maintain interconnection queue reports on their websites in spreadsheet format (Working Group Report, p. 11). Dominion objected, stating that this would increase costs (Working Group Report, p. 11-12, Comment [A19]). NCSEA notes that DEC and DEP already provides spreadsheets of their interconnection queue on their website[4]. While DEC and DEP do not provide as much information as IREC seeks, the addition of the items that are lacking should not create a substantial administrative burden (e.g., zip code).

Strata recommended that the utilities file monthly interconnection queue reports, including compliance with the deadlines set by the Interconnection Standard (Working Group Report, pp. 12-13). IREC made a similar suggestion (Working Group Report, p. 13-15). NCSEA recommended specifically that utility reporting include information about the utilities' average times and the interconnection's required deadlines (Working Group Report, p. 15). NCSEA notes that delays in the interconnection process have been extremely detrimental to interconnection customers and, as discussed above, Duke, via its counsel, felt it was "not a good use of time" to discuss them in the Stakeholder Process. NCSEA reiterates its recommendation that was included in the Working Group Report, and further supports the recommendations of IREC and Strata.

[4] https://www.duke-energy.com/business/products/renewables/generate-your-own/interconnection-queue.

Dominion recommends that stakeholders discuss existing reporting requirements before increasing the frequency of reports or requiring additional information in reports (Working Group Report, p. 11, Comment [A19]). NCSEA would welcome such a discussion, but notes that Dominion waited until after the Stakeholder Process had ended to make the suggestion.

Strata recommended the utilities be required to file reports of any responses that were not provided within the timeframe required by the Interconnection Standard (Working Group Report, p. 56). IREC specifically noted its support for this form of transparency (Working Group Report, Comment [A95], p. 56). NCSEA supports both transparency as well as efforts to reduce delays and bring utilities into compliance with the timing requirements of the Interconnection Standard. As such, NCSEA supports this provision as well.

D. Material Modifications.

During the Stakeholder Process, Working Group 2 conducted extensive discussions on the benefits and applications of smart inverter functions and energy storage devices. Through the process of these discussions it became clear that in order to realize the benefits of these technologies, a mechanism for adopting them should be applied to projects currently in the interconnection queue. A significant part of the Working Group 2 discussions then focused on updating the Material Modification sections of the Interconnection Standards to allow for inclusion of these technologies.

The Material Modifications discussions covered both what should be considered a Material Modification, as well as when in the interconnection study process certain changes should be deemed material. Certain changes which impact only the DC side of a facility (i.e. adding DC-coupled energy storage) were included in Section 1.5.2.5 and could be made at any time without triggering a Material Modification. *See*, Working Group Report, p. 20. Other changes, which would impact the AC configuration of a facility (i.e. AC-coupled energy storage) could be made before the detailed studies were undertaken by the utility, which led to the bifurcation of the material modification section into items that could be modified before and after the system impact study began. Working Group 2 participants, including the utilities, were in general agreement on the language submitted by Working Group 2. Duke then submitted alternative language which kept much of the Working Group 2 language but left several items at the utility's discretion. For the sake of clarity and to keep true to the Stakeholder Process, we recommend that the original Working Group 2 language be approved, rather than Duke's revised version.

E. SWINE AND POULTRY RESOURCES.

The changes regarding the interconnection of generators utilizing poultry and swine waste resources that are attributed to the Public Staff in the Working Group Report are the result of a consensus among interested stakeholders. NCSEA was involved in these discussions, and is supportive of the changes proposed by the Public Staff. *See generally*, Working Group Report, p. 22, Comment [A38], pp. 24-25, Comment [A41], and p. 63, Comments [A106] and [A107]. However, NCSEA cannot support the changes to the consensus language that have been proposed by Duke, as no explanation has been provided. Working Group Report, p. 25, Comments [A42] to [A48].

F. Queue Management.

NCSEA does not support Duke's proposal to allow standby generators to "jump" the queue. Working Group Report, pp. 25-26; see also, Comment [A108], p. 63 of PDF; Comment [A119], p. 68 of PDF.

G. Deposits.

NCSEA supports GGE's recommendation to allow for a partial refund of deposits wherein the utility fails to provide proper notification. *See* Working Group Report, p. 25.

H. Technical Working Group.

NCSEA proposed that utilities shall keep updated an Interconnection Requirements document to detail and communicate utility-specific interconnection requirements, processes and procedures. The utility shall gather stakeholder inputs regarding any revision of the Interconnection Requirements document through a new working group with relevant stakeholders. *See* Working Group Report, p. 26. IREC supported the creation of a new technical working group to vet changes to processes (etc.) proposed by utilities and also sought for the allowance of implementation of changes only with stakeholder consensus and Commission approval.

Dominion, again, noted its concerns about confidentiality of information after the Stakeholder Process had ended. Working Group Report, p. 26, Comment [A49]. NCSEA welcomes the opportunity to work with Dominion in a mutually beneficial manner to find a method of sharing information about the study and screening process that does not violate confidentiality.

I. Fast Track.

NCSEA supports all of IREC's fast track recommendations:

1) Working Group Report, p. 30, Comments [A58] and [A59];

2) Working Group Report, p. 31, Comment [A63];

3) Working Group Report, p. 35, Comments [A64] and [A65].

NCSEA supports IREC's recommended changes to Supplemental Review

1) Working Group Report, p. 36, Comment [A67];

2) Working Group Report, Redlined language on pp. 36-40;

NCSEA does not oppose Duke's late-submitted suggestion that Interconnection Customers be allowed to skip fast track and proceed directly to Supplemental Review. Working Group Report, p. 31, Comment [A62]. However, NCSEA believes that the fact that Duke felt it necessary to make this suggestion highlights the underlying flaws with the Fast Track process.

J. CLUSTER STUDIES.

GGE suggested discussion of cluster studies. Working Group Report, p. 41, Comment [A68]. NCSEA had raised this as one of its initial issues. See *Exhibit 5*. NCSEA continues to believe that discussions of cluster studies are necessary; however, cluster studies were not discussed during the Stakeholder Process.

K. TRANSPARENCY OF STUDY RESULTS.

Strata recommended requiring utilities provide all underlying analysis used to reach the conclusions made in a System Impact Study report. Working Group Report, p. 43, Comment [A76]. After the conclusion of the Stakeholder Process, Dominion suggested that this be limited in scope. Working Group Report, p. 43, Comment [A76].

NCSEA, IREC, and Strata all supported not considering receipt of the System Impact Study Report by the Interconnection Customer to be complete until such underlying analysis is received. Working Group Report, p. 43, Comment [A77] and [A79].

L. DISPUTE RESOLUTION.

NCSEA raised dispute resolution on its initial issues list. See *Exhibit 5*. IREC recommended that an Ombudsperson be given certain authority over dispute resolution. Working Group Report, p. 48-49. Rather than engaging during the Stakeholder Process and providing comments, Dominion waited until after the Stakeholder Process had completed to note its objection to this idea. Working Group Report, p. 48, Comment [A88].

M. CAPACITY OF GENERATING FACILITIES.

The Working Group Report appears to indicate that Working Group 2 unanimously supported the addition of Section 6.10.2. Working Group Report, p. 53. However, this proposal was not unanimously supported by the participants of Working Group 2. NCSEA is in agreement with IREC's comment regarding control devices. Working Group Report, p. 53, Comment [A93].

N. COST ESTIMATES.

After the Stakeholder Process had ended, Duke proposed changing the "Preliminary Estimated Interconnection Facilities Charge" and "Preliminary Estimated Upgrade Charge" from "unit costs" to "high level estimates" (Working Group Report, pp. 62-63, Comments [A104] and [A105]). Duke has not provided a justification for this proposal. Without knowing the rationale for the proposal, NCSEA cannot support it.

O. POST-CONSTRUCTION INSPECTIONS.

Duke has already been requiring post-construction inspections and charging Interconnection Customers for them. Duke appears to be seeking from the Commission a blessing for the pattern and practice that they have already instituted. *See* Working Group Report, pp. 127-129, Comment [A153], Comment [A154], Comment [A155].

IV. DUKE'S PATTERN OF UNILATERAL ACTION.

On several occasions, including during the pendency of the Stakeholder Process, Duke has used its control over the technical standards for interconnection in an attempt to impede solar QF development and purge QF projects from its interconnection queue on dubious technical grounds.[5]

A. CIRCUIT STIFFNESS POLICY.

In May of 2016, Duke announced a new "Circuit Stiffness Policy" ("CSR Policy"). Under the CSR Policy as initially proposed by Duke, distribution circuits identified by Duke as being "low-stiffness" would be sharply limited in the amount of solar generation allowed to interconnect. QF projects in excess of those limits would be required to downsize, interconnect to the transmission system, or withdraw from the interconnection queue. As proposed, the CSR Policy would apply to all projects that did not have a final, executed Interconnection Agreement, even though at that time Duke routinely did not execute Interconnection Agreements, even for projects that achieved interconnection.

Duke justified the CSR Policy by citing a handful of power quality issues for load customers that had occurred on circuits with significant solar penetration. Subsequent

[5] It is worth noting that Dominion does not utilize the interconnection screens used by Duke and discussed in this section.

investigations showed that those incidents were not caused by the presence of solar facilities on those circuits.[6] Solar developers resisted Duke's imposition of the CSR Policy, and challenged the policy under the dispute resolution procedures of the Interconnection Procedures.

A subset of solar developers and Duke ultimately negotiated an agreement under which projects relatively far along in the interconnection process would not be subjected to CSR analysis if they agreed to install power quality monitoring equipment and accept certain changes to their interconnection agreements. That settlement was filed with the Commission (for informational purposes) in this docket on August 29, 2016.[7] In addition, Duke agreed to modify the CSR Policy so that low stiffness would not serve as bar to distribution interconnection, but would instead trigger more detailed analysis of power quality issues as part of the System Impact Study. Duke has come to refer to that additional study step as "Advanced Study." There is no reference to the "Advanced Study" in the interconnection standard and no suggestion from Duke to add it.

Duke told developers that the Advanced Study process generally should take about three weeks after the provision of additional technical information by the developer, and should not significantly increase study costs. Duke also stated that upon completion of the Advanced Study, it should take about three more weeks for the developer to receive the System Impact Study Report. In reality, the Advanced Study has added significantly to the cost and duration of the System Impact Study Process. The Advanced Study process alone has taken more than eight months for some QF projects. Other QF projects have not received SIS Reports more than seven months after Duke reported that the Advanced Study

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[6] *See* Comments of Strata Solar, filed on September 22, 2016 in Docket No. E-100, Sub 101.
[7] *See* Settlement Agreement filed on August 29, 2016 in Docket No. E-100, Sub 101.

was complete for those projects. In some instances, Duke has required projects to downsize or select other "mitigation options" to address the impacts identified by Advanced Study. However, in most cases Advanced Study has not resulted in a determination that the affected projects cannot connect to the distribution system at their originally proposed capacity – the outcome Duke originally sought to achieve through unilateral action not approved by the Commission.

B. LINE VOLTAGE REGULATOR POLICY.

In October 2016, one business day after resolution of the CSR Policy controversy between Duke and the solar industry, Duke unilaterally announced *another* policy with a significant negative impact on interconnection customers: the Line Voltage Regulator ("LVR") Policy. The LVR Policy, as originally proposed, would prevent any QF or other utility-scale DG resource above a certain capacity from interconnecting to a distribution line "downstream" of an existing line voltage regulator, or any location where Duke *planned* (based on the results of an *ad hoc* study conducted for each project) to ultimately put an LVR, even if the line voltage regulator is not to be installed until years later. Prior to announcement of the LVR Policy, Duke generally had not made information about the location of existing and planned LVRs in its service territories available to developers. As with the CSR Policy, Duke applied the LVR Policy to all projects without final Interconnection Agreements, no matter how long they had been in the queue. Initial estimates suggested that up to 85% of the projects in Duke's distribution interconnection queue might be impacted by the LVR Policy.

Again, developers challenged the new policy under the dispute resolution provisions of the Interconnection Procedures. In or around March 2017, Duke modified the

LVR Policy to mitigate (though not eliminate) its impacts. As modified, the LVR Policy would only impact projects located behind existing LVRs, and LVRs that were already planned (as the result of a periodic load growth study) prior to the project going into System Impact Study. This change significantly reduced the number of projects impacted by the LVR Policy – indicating just how far Duke had overreached with the LVR Policy in the first place. But even the modified LVR Policy has affected a significant number of QF projects in development in North Carolina.

The primary justification for Duke's adoption of the LVR Policy was that interconnection of solar generators beyond voltage regulators would incrementally reduce the effectiveness of the Distribution System Demand Reduction (DSDR) operated by DEP. However, company representatives acknowledged that Duke never attempted to quantify this impact. Duke has never provided NCSEA with any engineering study or other quantitative analysis in support of the LVR Policy. Further, based on feedback from NCSEA's members, it appears that Duke completely stopped conducting system impact studies for projects impacted by the first iteration of the LVR Policy between the time the policy was announced in November 2016 and its modification in March 2017.

C. METHOD OF SERVICE GUIDELINES.

Pursuant to the Commission's 2015 order, the Public Staff convened the Stakeholder Process in May 2017, just a few months after Duke's modification of its LVR Policy. In its initial issues list, NCSEA noted Duke's unilateral imposition of interconnection screens.[8] At no time during the Stakeholder Process did Duke suggest that it was contemplating additional policies limiting interconnection to its distribution system

[8] *See Exhibit 5.*

or that such policies were needed – let alone propose such policies for stakeholder comment and debate.

However, in a series of calls and meetings outside the Stakeholder Process starting in September 2017, Duke for the first time announced new “Method of Service Guidelines” (alternatively, the “Method of Service Policies,” or “MOS Policies”) that would go into effect on October 1, 2017. The MOS Policies are yet another new set of interconnection policies that Duke is attempting to use to purge its interconnection queue of solar projects that have been under development and pending in the queue for many months, if not years, to block competition from independent power producers, and to pave the way for Duke and its affiliated companies to own a larger share of North Carolina’s clean energy future. Some aspects of the new MOS Policies would potentially apply to every project in Duke’s distribution interconnection queue that did not have an executed Interconnection Agreement (IA) by that date. Most aspects of the MOS Policies would apply to all projects that did not have a System Impact Study completed by October 1, 2017.

There are three primary elements to the MOS Policies.[9] First, the Policies limit the size of individual project interconnections, based on the voltage class of the distribution feeder to which it would interconnect or, in the case of DEC, the upstream transmission line voltage (“the Individual Project Restrictions”). Second, they limit the aggregate amount of generation permitted on individual distribution feeders based on Duke’s “distribution planning limit” for the feeder (the “Feeder Restriction”). Third, they limit the amount of generation permitted to interconnect to a substation transformer to the lowest nameplate capacity value of the transformer, even where the transformer actually operates

[9] See “DER Planning Guidelines” attached hereto and incorporated herein as *Exhibit 6.*

with a substantially higher nameplate capacity value based on its installed cooling equipment (the "Nameplate Restriction"). Projects not meeting these arbitrary limitations generally would not be allowed to interconnect to the distribution feeder. Instead, they would have to choose a different "Method of Service," such as interconnection directly to Duke's transmission grid. Generally speaking, the cost of these other options would be substantially higher than interconnection to distribution and not economical, meaning that imposition of the MOS Policies would result in the projects being cancelled.

The MOS Policies were rolled out by Duke unilaterally and on extremely short notice. NCSEA was informed of the Policies approximately one week before they went into effect on October 1, 2017. Duke did not engage NCSEA or its members in any meaningful technical dialogue regarding the MOS Policies (other than explaining what the MOS Policies are and what Duke's putative justifications are). To the best of NCSEA's knowledge, Duke did not seek input from the Public Staff or the Commission prior to introducing the MOS Policies or attempt to develop less draconian solutions to the problems it claimed it was trying to solve.

Duke did not give (and has never given) any reason why the MOS Policies had to be implemented immediately, or why they had to be applied to all projects currently in the interconnection queue, rather than on a prospective-only basis. In fact, Duke's justification for the MOS Policies evolved over the course of the weeks and months following the September meeting. Duke initially justified the MOS Policies based on their reading of H.B. 589, and compared its grid to that of Hawaii; Duke later stated that the MOS Policies were justified as good utility practice.

Duke has failed to explain why it did not bring up the supposed need for these policies in the Stakeholder Process, in negotiations on H.B. 589, or in the most recent biennial avoided cost proceeding[10] (where a number of interconnection concerns, including the issue of substation backfeed that Duke now cites as a primary driver of the Nameplate Restriction, were discussed.). Duke has not shared with NCSEA or its members any engineering or technical study to support the various elements of the MOS Policies. On information and belief, Duke has never conducted such a study. The MOS Policies are, rather, based on Duke's unsubstantiated "concerns" about the interconnection of distributed generation on its distribution systems.

1. THE NAMEPLATE RESTRICTION.

The primary concern articulated by Duke in support of the Nameplate Restriction is preventing "excess" backfeed from distribution circuits during periods of low demand. Duke has sometimes claimed that the problem with such backfeed is wear and tear on the transformer and at other times has focused on alleged concerns about the impact of such backfeed to the transmission system. However, Duke has not provided any detailed technical information to support either of these concerns nor considered any ways to address them without rendering unviable projects that have been under development for a long time. Backfeed from distribution onto transmission already occurs on a regular basis in the North Carolina service territories of both Duke and Dominion, and Duke has not identified any negative consequences currently occurring or likely to occur if backfeed increases. Nor has Duke specified what degree of backfeed is acceptable on its system.

[10] Docket No. E-100, Sub 148.

In attempting to justify the Nameplate Restriction, Duke has also claimed that continuing to allow backfeed onto the system would require the utility to study both distribution and transmission impacts for every project. However, study of power flow on the transmission system is performed regularly by Duke's Transmission Planning for system planning and generation interconnection directly to the transmission system. Further, Section 4.3.3 of the Interconnection Procedures requires Duke to study both distribution and transmission system impacts (if required) in the SIS. Other utilities and Independent System Operators do regularly evaluate the power flow from distribution projects onto the transmission system, indicating that studying this backfeed is technically feasible and constitutes Good Utility Practice. Even if backfeed were a legitimate concern, Duke has not demonstrated why its nameplate restriction is an appropriate indicator of the incidence of backfeed on the substation. In fact, a substantial number of existing QF Projects are already interconnected to substation transformers where the aggregate capacity exceeds the Nameplate Restriction, with no impacts to safety or reliability.

The Nameplate Restriction is also inconsistent with the operational realities of Duke's system. A substation transformer typically has multiple "nameplate capacity" ratings, corresponding to different methods of cooling the oil inside and the air outside the transformer (better cooling yields higher capacity). These include the ONAN ("oil natural, air natural") rating, representing the least efficient cooling and thus the lowest capacity rating; and the ONAF ("oil natural, air forced") rating, representing substantially more effective cooling. Because of its more effective cooling, the ONAF nameplate rating of a substation transformer is approximately 60% higher than the ONAN nameplate rating. The Nameplate Restriction limits aggregate interconnection on substation transformers to the

ONAN rating of the transformer. However, Duke has acknowledged that ONAN ratings do not correspond to how its substation transformers are actually cooled, and thus the actual nameplate capacity of those transformers.[11]

In addition, ONAN values do not (at least in DEP's service territory) correspond to information about nameplate capacity included in Pre-Request Responses and Pre-application Reports provided by the utility to interconnection customers pursuant to Sections 1.2 and 1.3 of the Interconnection Procedures. Until September 2017, DEP consistently reported the ONAF capacity rating for substation transformers in those documents. Duke' representatives have stated in Commission filings that developers should rely on the information contained on those reports to assess the available capacity on particular substations and site their projects appropriately. NCSEA's members did in fact rely on that information in incurring tens of thousands of dollars of development costs per project.

2. THE FEEDER RESTRICTION.

With regard to the Feeder Restriction, there is no indication that interconnection of projects above the proposed limits will result in voltage or other reliability impacts. Duke's use of the proposed values as a trigger for automatically ejecting projects from the distribution queue, rather than as a screen for further study, does not constitute Good Utility Practice. The application of the Feeder Restriction limits the generation capacity to 330 Amps of current on a feeder. The standard conductor is rated at a maximum of around 660 Amps, meaning Duke's Feeder Restriction limits generation on a feeder to 50% of the

[11] It is NCSEA's understanding that, in all relevant circumstances, the "nameplate capacity" of Duke's substation transformers is the higher (ONAF) capacity. That is because those transformers include the cooling equipment and operating configurations that correspond to the ONAF capacity rating.

maximum thermal rating of the conductor. It is NCSEA's understanding that a substantial number of existing QF Projects are already interconnected in excess of the Feeder Restriction, with no impacts to safety or reliability.

Duke has suggested that the Feeder Restriction is necessary to preserve the ability to implement a "self-healing grid,"[12] which would allow customers on a feeder to be supplied from a secondary substation if the primary substation supply was not available. While this configuration does increase reliability under emergency conditions, the Feeder Restriction does not constitute Good Utility Practice for feeders with a secondary source of supply and is inconsistent with how utilities throughout the country study interconnection to this type of circuit. Further, a large number of circuits in the Duke system cannot feasibly be connected to a second source of supply because they border the territory of another utility or face other constraints. Even when a secondary source of supply is impossible, Duke would apply the Feeder Restriction without performing a SIS and limit the DER capacity to significantly less than the thermal rating of the circuit.

3. THE INDIVIDUAL PROJECT RESTRICTION.

There is no indication that interconnection of projects above the limitations established in the Individual Project Restriction is likely to result in system impacts, and Duke's use of the proposed values as trigger for ejecting projects from the queue, rather than a screen for further study, does not constitute Good Utility Practice. The potential adverse impacts that could be associated with larger projects such as voltage, thermal, and short circuit impacts, should be evaluated during the System Impact Study. On information

[12] NCSEA notes that both DEC and DEP have recently testified in the context of Duke's proposed Power/Forward investments that a self-healing grid will increase the amount of DG that can be connected to their grids. *See* Direct Testimony of Robert Simpson, III in Docket Nos. E-2, Sub 1142 and E-7, Sub 1146. In this proceeding, however, Duke is stating the opposite.

and belief, a substantial number of existing QF Projects are already interconnected in excess of the Individual Project Restrictions, with no impacts to safety or reliability.

4. THE MOS POLICIES ARE INCONSISTENT WITH GOOD UTILITY PRACTICE, THE LEGISLATIVE COMPROMISE EMBODIED IN H.B. 589, DEP'S PREVIOUS PRACTICE, AND THE INTERCONNECTION STANDARD.

Put together, the MOS Policies are not Good Utility Practice. Duke's implementation of the MOS Policies: (a) is not consistent with the policies of other utilities in the region; (b) is unsupported by and inconsistent with relevant industry standards; (c) imposes unreasonable costs on interconnection customers; and (d) is not consistent with good business practices. The use of the MOS Policies as a blanket prohibition on distribution interconnection, rather than as screens triggering further study, is inconsistent with prevailing industry standards and does not constitute Good Utility Practice.

Duke has claimed that H.B. 589 authorizes implementation of the MOS Policies. But no provision of that law authorizes Duke to make any changes to its interconnection policies, other than the portion of the grandfathering provision (Section 1.(c) of the law) allowing Duke to require projects 10 MW or greater to interconnect to the transmission system. To the contrary, the MOS Policies directly contravene H.B. 589 Section 1.(c), pursuant to which Sub 140 projects stuck in Duke's the interconnection queue will remain eligible for the Sub 140 rate schedule even if they do not go into operation by the time that tariff expires. Duke negotiated for, and obtained, the ability to exclude from grandfathering any project on a substation with interconnected DG in excess of the substation transformer's "nameplate capacity." Duke also obtained the right to require existing projects over 10 MW, without an interconnection agreement already in place, to interconnect at transmission. If Duke were already authorized to wipe out a broad swath of

Sub 140 projects already in the interconnection queue, as it now seeks to, these legislative provisions would be meaningless.

Prior to Duke's announcement of the MOS Policies, its consistent practice (at least in DEP's service territory) was to refer to the ONAF capacity rating as the nameplate capacity of DEP transformers and to inform interconnection customers that the capacity of a substation corresponded to the ONAF rating. DEP was reporting ONAF values as the nameplate capacity of substation transformers as late as September 2017.

Under the Interconnection Procedures, Duke is required to conduct a System Impact Study for each project identifying and detailing any Adverse Impacts of the proposed project on the distribution and transmission systems, in accordance with the project's System Impact Study Agreement. As discussed above, Duke has, to NCSEA's knowledge, never conducted any engineering or technical study identifying or detailing the Adverse Impact of the proposed interconnection of the QF projects impacted by the MOS Policies, much less shared any such study with the affected QFs. Rather than conduct the studies required by the Interconnection Procedures, Duke is using the blunt instrument of the MOS Policies as a blanket justification for refusing to interconnect QF projects to its distribution system. To the extent that the MOS Policies might be supported by legitimate technical concerns about safety and reliability the Interconnection Procedures –and Good Utility Practice – would require Duke to perform a System Impact Study and document any Adverse Impacts of the proposed interconnections, rather than simply purge those projects from the interconnection queue without study.

D. IMPACT OF DUKE'S UNILATERAL ACTIONS.

By implementing these policies unilaterally, Duke has evaded the Commission's oversight and refused to comply with the Commission's directives. Cumulatively, Duke's unilateral actions have had a major and lasting impact on NCSEA's members, and are likely to benefit Duke's shareholders instead of North Carolina ratepayers.

1. IMPACT ON THE COMMISSION-ORDERED INTERCONNECTION STAKEHOLDER PROCESS.

As noted above, Duke announced and implemented the MOS Policies while the Commission-ordered Stakeholder Process was ongoing. Duke never discussed the MOS Policies at any Stakeholder Process meetings. The Public Staff, NCSEA, NCSEA's members, and other stakeholders have invested significant time and resources in good-faith efforts to formulate revised rules that will fairly and appropriately address the concerns of all stakeholders regarding the current procedures.

The Stakeholder Process was not limited to questions of process: stakeholders engaged in extensive discussion of technical issues related to interconnection. The parties also discussed the concept of establishing a Technical Working Group process for stakeholder review of future Duke interconnection policies. Although it would have been appropriate for Duke to raise the concerns allegedly behind the MOS Policies in the Stakeholder Process, Duke instead introduced the MOS Policies outside of that process, without input from QFs, the Public Staff, or the Commission. Duke's implementation of the MOS Policies in this way has compromised and undermined the Commission-ordered Stakeholder Process.

2. Impact on the Interconnection Queue.

Although the queue data provided by Duke in its Quarterly Queue Status Reports have significant limitations, NCSEA's analysis of those data indicate that since 2016, roughly coincident with Duke's issuance of the CSR and LVR policies, Duke's processing of the queue has slowed noticeably. Over that time, the number of projects to obtain interconnection has been dwarfed by the number of cancelled or withdrawn projects.

With both the CSR and the LVR Policies, Duke has initially proposed a questionable policy that severely impacted projects in the queue, and then modified the policy to mitigate its impact after the industry resisted the new policy. The net result, however, has been to purge some projects from the queue, and to significantly increase interconnection delays for remaining projects.

A number of NCSEA's members have invested significant time and money in coping with Duke's CSR and LVR policies for specific projects (for example, by paying tens of thousands of dollars in Advanced Study costs, or obtaining rights-of-way to interconnect "upstream" of nearby LVRs), only to have those same projects now impacted by the MOS Policies.

If Duke, or any other utility, can continue to make unilateral changes to its interconnection policies that will (like the CSR, LVR, and MOS Policies) significantly impact the interconnection prospects of projects already in the queue, it creates grave uncertainty and a significant risk of unfairness for bidders (other than Duke and its affiliates) in the competitive procurement process.[13]

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[13] *See* Docket Nos. E-2, Sub 1159 and E-7, Sub 1156.

3. IMPACT ON THE DUKE'S BUSINESS.

Duke has made no secret of its unhappiness with its obligations under PURPA. Through the passage of H.B. 589 – and with the support of NCSEA for H.B. 589's solar provisions – Duke was able to obtain significant modifications to North Carolina's regulatory regime governing renewable energy development. Most notably, it obtained provisions that greatly reduced the PURPA rights of NCSEA's members and transitioned the state to much greater reliance on competitive procurement of renewable energy. In addition, in this Commission's Final Order in the most recent biennial avoided cost proceeding, Duke was able to secure other changes to NC's PURPA implementation in the state that further undermine QFs' ability develop projects in North Carolina.[14] Together, these measures completely restructured the PURPA regulatory regime in North Carolina, moving it away from the PURPA "must-take" model to a competitive solicitation model long favored by Duke.

Duke's new interconnection policies, without substantial technical justification and without any opportunity for the study of actual, project-specific impacts to the grid, arbitrarily limit the amount of non-utility generation that can interconnect on any distribution circuit in Duke's territories. Projects over the arbitrary capacity restrictions set by Duke will generally have to interconnect directly to the transmission system – a prohibitively expensive, and often impossible, alternative for most small projects. Such projects will almost certainly have to withdraw from the interconnection queue, and the companies that have invested significant amounts of time and money in those projects in reliance on the existing Interconnection Procedures and on capacity information provided

[14] *See* Docket No. E-100, Sub 148.

by Duke will see their investments disappear. The adverse impacts to the investments of solar developers, many of whom are members of NCSEA, will reach into the hundreds of millions of dollars.

Duke stands to profit from these policies in ways that go beyond just cleaning out its interconnection queue. If implemented, they will ultimately lead to Duke owning or controlling a much larger portion of solar generating capacity constructed in North Carolina pursuant to the CPRE. This is because H.B. 589 not only calls for a competitive procurement of 2,660 MW of renewable capacity over four years; it also requires Duke to obtain a baseline of 3,500 MW of renewable capacity from other, non-CPRE sources, including solar projects currently under development. If Duke fails to meet that 3,500 MW baseline, it must conduct additional solicitations in the CPRE to make up the shortfall. Under the CPRE, Duke and its affiliates are allowed to self-develop 30% of the required 2,660 MW of required renewable energy procurement over the next four years.[15] Thus, every megawatt of independently owned renewable energy now under development that is cancelled due to Duke's new, arbitrary policies is a megawatt Duke can potentially own itself through the CPRE.

Duke implemented the MOS Policies – which apply not only to new projects but also to projects that have been pending in the interconnection queue for years – on extremely short notice, with no stakeholder involvement, no attempt to develop less draconian solutions to the problems it claims are presented by the affected projects, and no attempt to inform (much less seek the approval of) the Commission. More troublingly, it

[15] N.C.G.S. 62-110.8(a), (b)(1). Notwithstanding the 30% limit on self-developed projects, Duke may without limitation purchase projects developed by winning bidders, and thus end up owning significantly more than 30% of the capacity to be developed under the competitive solicitation program.

made these unilateral changes to its interconnection standards even as it purported to participate in good faith in the Commission-ordered Stakeholder Process. These actions are part and parcel of Duke's repeated efforts over the last 18 months to use arbitrary and unilaterally imposed interconnection policies in order to clear QF projects from its queue.

It is NCSEA's belief that the Commission should, given Duke's history of attempting to use interconnection policies to eliminate competition from non-utility generators, require that any other new Duke interconnection policies with a significant impact on projects already in-queue go through a stakeholder review process and be approved by the Commission.

V. CONCLUSION.

For all the reasons set forth above, NCSEA requests that the Commission implement all the suggested changes made by NCSEA within its comments, both here and in the redlined Working Group Report.

Respectfully submitted, this the 29th day of January, 2018.

/s/ Peter H. Ledford

Peter H. Ledford
General Counsel for NCSEA
N.C. State Bar No. 42999
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Raleigh, NC 27609
919-832-7601 Ext. 107
peter@energync.org

CERTIFICATE OF SERVICE

I hereby certify that all persons on the docket service list have been served true and accurate copies of the foregoing Comments by hand delivery, first class mail deposited in the U.S. mail, postage pre-paid, or by email transmission with the party's consent.

This the 29th day of January, 2018.

/s/ Peter H. Ledford

Peter H. Ledford
General Counsel for NCSEA
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4800 Six Forks Road, Suite 300
Raleigh, NC 27609
919-832-7601 Ext. 107
peter@energync.org

NCSEA Exhibit 1

NCCEBA
REPRESENTING CLEAN ENERGY BUSINESSES

NC SUSTAINABLE ENERGY ASSOCIATION

Interconnection Stakeholder Process

Chris Carmody
Executive Director
NCCEBA

Peter Ledford
General Counsel
NCSEA

NCCEBA
REPRESENTING CLEAN ENERGY BUSINESSES

NC SUSTAINABLE ENERGY ASSOCIATION

Background

- NCSEA and NCCEBA jointly surveyed our membership about their issues related to interconnection in North Carolina
  - 30 member companies responded, representing 448 projects in the interconnection queue
  - Responses of 26 of these companies are shown in the graphs that follow

June 1, 2017 2

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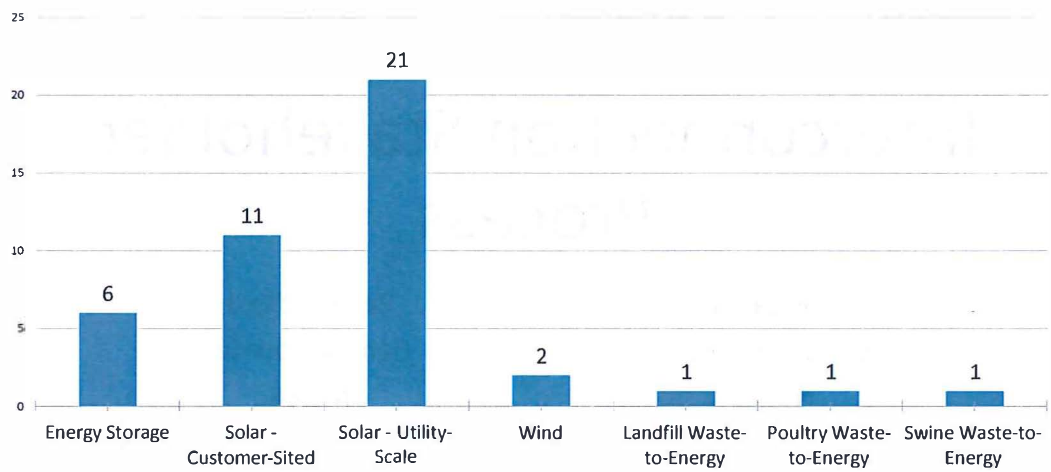

June 1, 2017 3

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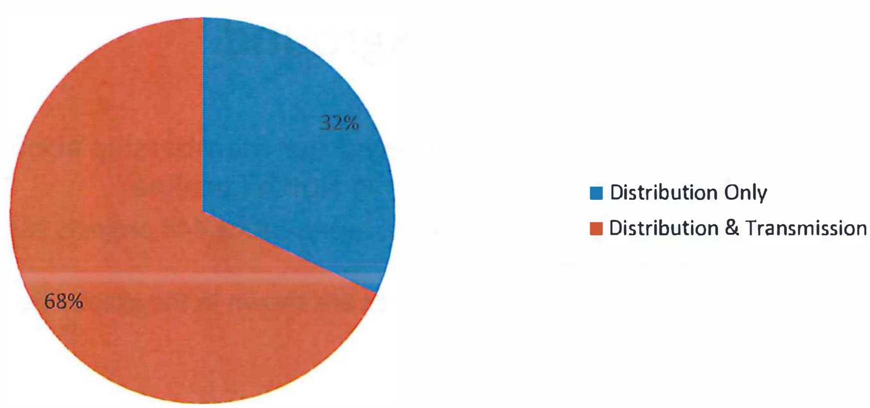

June 1, 2017 4

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Interconnection Timing

- Longest time in the interconnection queue:
  - 3.5 years
- Longest time in the interconnection queue for small project:
  - 275 days for a 125 kW project

June 1, 2017 5

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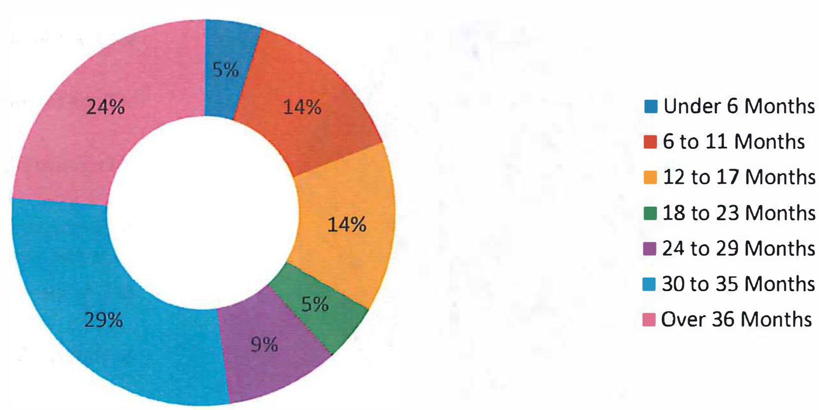

June 1, 2017 6

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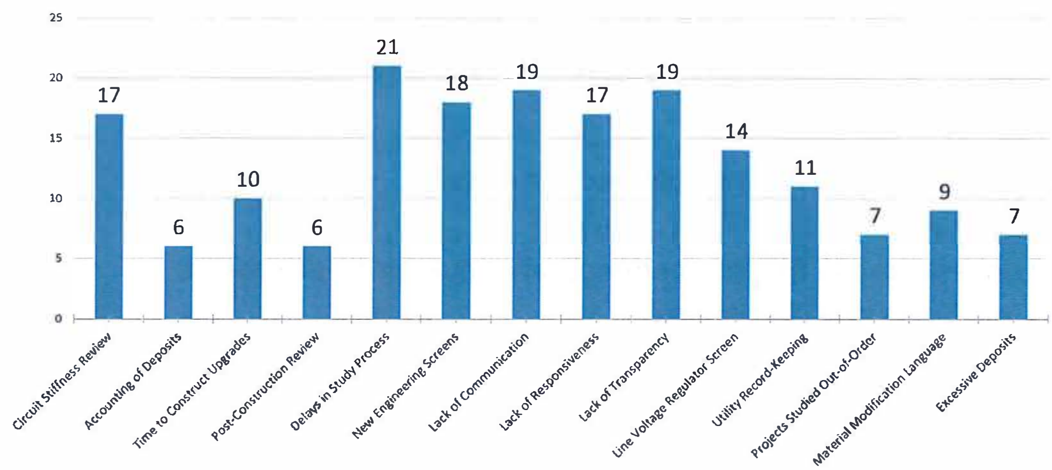

June 1, 2017 7

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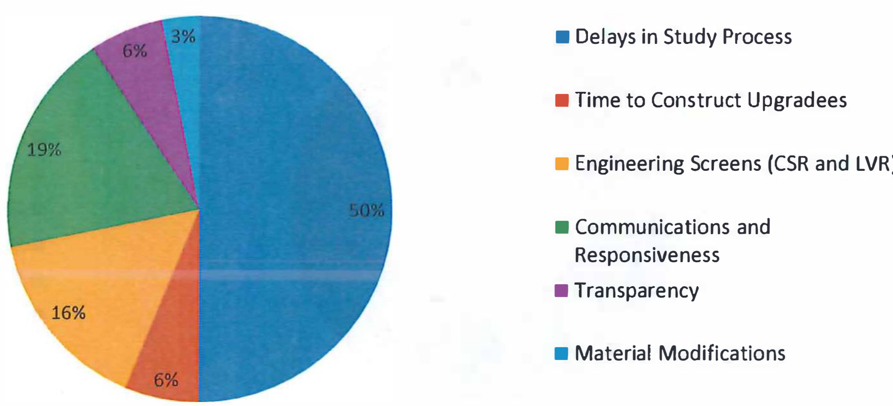

June 1, 2017 8

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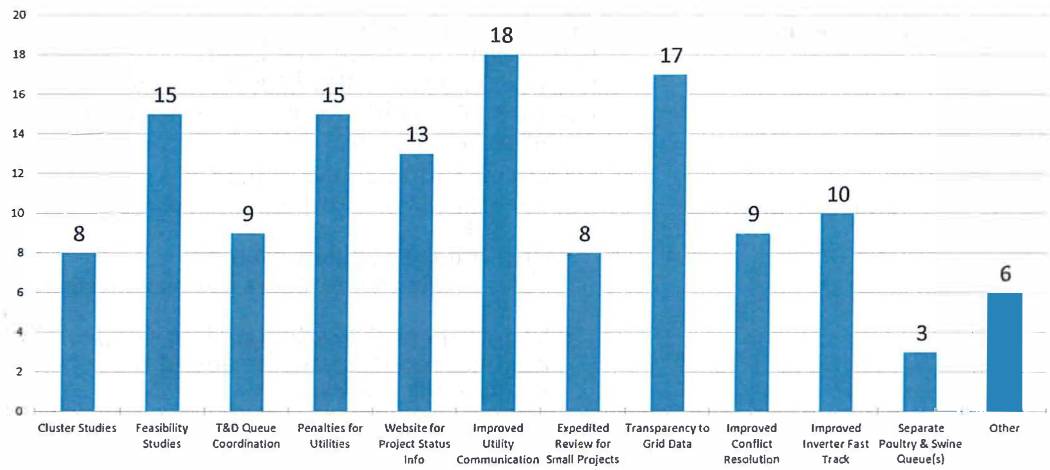

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Guiding Principle

- What are the goals of any changes to the interconnection standard?

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Screens and Standards

- Are the engineering screens and requirements that have been unilaterally imposed by Duke justified? If so, should they be added to the interconnection standard and how?
  - Circuit Stiffness Review (CSR)
    - Is the CSR threshold set at the appropriate level?
  - Line Voltage Regulator screen
    - Is this impacted by Duke's grid modernization plan?
  - Requirement that additional material modification language be added to engineering drawings

June 1, 2017 11

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Screens and Standards

- Are the construction standards and post-construction review that have been unilaterally imposed by Duke justified? If so, should they be added to the interconnection standard and how?
- Because of the imposition of these screens and requirements, do we really have a good understanding of whether the current interconnection standard is not working?
- If additional engineering screens are necessary in the future, how should those be implemented? What Commission oversight should be necessary?

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Structural Changes

- Are structural changes to the interconnection queue necessary?
- Should separate interconnection queues be established for poultry and swine waste projects?
- Should a separate interconnection queue, with an expedited review process, be established for projects under 1 MW in capacity (regardless of whether a system is net metered or sell-all)?
- Should the distribution and transmission queues be merged?
- Should cluster studies be adopted?
  - If so, how should upgrade costs be divided among projects in the cluster?
- Are projects being studied out-of-order? If so, how can that be addressed?

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Early Identification of Flaws

- What changes can be made to identify projects that will have economically prohibitive interconnection costs, or other flaws that would render a project unfeasible, earlier in the process?
  - Feasibility studies
  - Pre-application meetings

June 1, 2017 14

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Transparency of Data

- What can be done to improve transparency of data? What data can the utilities make available to project developers that would allow developers to better evaluate the viability of a project prior to submitting an interconnection application?
  - Grid data
  - Substation loading

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Communication

- What can be done to improve communication between the utilities and project developers?
  - How are the utilities held accountable for failures to communicate with project developers?
  - Responsiveness to communications from project developers
  - Accounting of deposits from project developers and timely issuance of refunds
  - Website or online portal for project developers to check the status of their projects

June 1, 2017 16

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Delays

- What can be done to reduce delays in the interconnection process? What can give project developers certainty about when they will receive study results?
- Do the deadlines in the interconnection standard need to be changed? For utilities? For project developers?
- What can be done to require the utilities meet the deadlines in the interconnection standard? How are the utilities held accountable if they fail to meet deadlines? Are penalties necessary for utilities that fail to meet deadlines?

June 1, 2017 17

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Delays

- What can be done to require project developers respond to utility inquiries in a timely manner?
- Are the utilities properly staffing their interconnection groups?
  - Are project developers willing to pay larger deposits to allow for increased staffing?
  - Are outside engineers/consultants necessary?

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Impact on Other Proceedings

- How to delays in the interconnection process impact other proceedings? How do other proceedings impact the interconnection process?
  - Are changes to the 30-month rule necessary because of the delays in interconnection studies?

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Upgrades

- What can be done to ensure that the utility constructs upgrades in a timely manner?

June 1, 2017 20

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Conflict Resolution

- Are the conflict resolution procedures working as they should?
  - For project developers?
  - For utilities?
  - For the Public Staff?

June 1, 2017 21

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Inverters

- Does the interconnection standard make the best use of the services that can be provided by inverters?
  - California Rule 21
  - Can inverters be better utilized to address issues of in-rush after re-energization?

June 1, 2017 22

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Grid Services

- Does the interconnection standard make the best use of the services that can be provided by distributed generation?
  - Do the utilities have the data to identify locations on the grid where distributed generation can be beneficial? Are the utilities willing to share this data?
  - How does the interconnection standard interact with other utility planning processes, such as integrated resource planning?

June 1, 2017 23

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Grid Modernization

- How will Duke's grid modernization plan allow for increased deployment of distributed generation?
  - Should interconnection deposits be reduced in light of Duke's expected investment in the grid?

June 1, 2017 24

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Good Utility Practice

- Is Duke's refusal to allow project developers access to their poles for feeders a good utility practice?

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Questions?

June 1, 2017 26

NCSEA Exhibit 2

	Interconnection Standard Document *Note which agreement, application, or standard is being referenced.	Note which section(s), paragraph, sentence is being referenced.	What is the problem/issue with the standard as it is currently written?	Proposed changes that address the issue
1	Pre-Application Report	Sec. 1.3	Grid data that could allow developers to identify unfeasible projects is not available, and therefore they enter into the interconnection process knowing that certain projects may never move forward	Make the data listed in Section 1.3.2 publically available so that developers can eliminate projects that are not feasible before entering the interconnection process.
2	Reasonable efforts	Sec. 6.1	Utilities are routinely failing to meet deadlines, and there is not a clear indication that they are making reasonable efforts, as required by Sec. 6.1	Utilities shall file reports with the NCUC outlining (1) the sections of the NCIP that require they meet a deadline, (2) their average response time, (3) the number of times that they have failed to meet the deadline, and (4) what "reasonable efforts" they are taking to improve their performance
3	Reasonable efforts	Section 6.1, definitions	Utilities are routinely failing to meet deadlines, and there is not a clear indication that they are making reasonable efforts, as required by Sec. 6.1	The Utility shall make best~~reasonable~~ efforts to meet all time frames provided in these procedures unless the Utility and the Interconnection Customer agree to a different schedule. . . .
4	Pre-request response	Sec. 1.2.2	Utilities are failing to provide information in a timely manner	. . . The Utility shall provide~~comply with reasonable requests for~~ such information within~~in a timely manner, not to exceed~~ ten (10) Business Days. . . .
5	Pre-application report	Sec. 1.3.3	Utilities are failing to provide adequate information to inform developers of why projects have failed various steps of the interconnection process	. . . If the Utility cannot complete all or some of the Pre-Application Report due to lack of available data, the Utility shall provide the Interconnection Customer with a Pre-Application Report within ten (10) Business Days that includes the data that is readily available. Notwithstanding any of the

	Interconnection Standard Document *Note which agreement, application, or standard is being referenced.	Note which section(s), paragraph, sentence is being referenced.	What is the problem/issue with the standard as it is currently written?	Proposed changes that address the issue
				provisions of this section, the Utility shall, in good faith, include data in accordance with Good Utility Practice in the Pre-Application Report that represents the best available information at the time of reporting. . . .
6	Material modifications	Sec. 1.5.3	Utilities are failing to provide information in a timely manner	. . . If the modification is determined by the Utility not to be a Material Modification, then the Utility shall notify the Interconnection Customer in writing within ten (10) Business Days that the modification has been accepted and that the Interconnection Customer shall retain its Queue Number. . . .
7	Fast track screen failure	Sec. 2.2.2	Utilities are failing to provide information in a timely manner	. . . If the Utility cannot determine that the Generating Facility may be interconnected consistent with safety, reliability, and power quality standards, the Utility shall provide the Interconnection Customer with detailed information on the reasons for failure in writing within ten (10) Business Days. . . .
8	Return of final IA	Sec. 5.2.3	Utilities are failing to provide information in a timely manner	After the Parties execute the Final Interconnection Agreement, the Utility shall return a copy of the Final Interconnection Agreement within ten (10) Business Days to the Interconnection Customer and interconnection of the Generating Facility shall proceed under the provisions of the Final Interconnection Agreement.
9	Timing	Sec. 6.3.3	Utilities are failing to provide information in a timely manner	If the Interconnection Customer's cost responsibility exceeds its previous aggregate payments, the Utility shall invoice the Interconnection Customer for the

	Interconnection Standard Document *Note which agreement, application, or standard is being referenced.	Note which section(s), paragraph, sentence is being referenced.	What is the problem/issue with the standard as it is currently written?	Proposed changes that address the issue
				amount due within ten (10) Business Days and the Interconnection Customer shall make payment to the Utility within 30 Calendar Days.
10	Timing	Sec. 6.3.3	Utilities are failing to provide accounting and refunds in a timely manner	. . . If the Interconnection Customer's previous aggregate payments exceed its cost responsibility under this Agreement, the Utility shall refund to the Interconnection Customer an amount equal to the difference within ten (10) Business Days~~30 Calendar Days~~ of the final accounting report.
11	Timing	20 kW Fast Track Sec. 2.3.1	Utilities are failing to provide information in a timely manner	. . . ~~The~~Within ten (10) Business Days, the Utility shall provide a written statement that the Generating Facility has passed inspection or shall notify the Customer of what steps it must take to pass inspection as soon as practicable after the inspection takes place; . . .
12	System Impact Study	Sec. 4.3.7	Utilities are not providing developers with adequate System Impact Study reports such that the developers have an understanding of the results of the analysis and how the costs were determined.	After receipt of the complete System Impact Study report(s), including the underlying analysis that led to the results of the study, the Interconnection Customer shall inform the Utility in writing if it wishes to withdraw the Interconnection Request and to request an accounting of any remaining deposit amount pursuant to Section 6.3.

	Interconnection Standard Document *Note which agreement, application, or standard is being referenced.	Note which section(s), paragraph, sentence is being referenced.	What is the problem/issue with the standard as it is currently written?	Proposed changes that address the issue
13	1.X INTERCONNECTION REQUIREMENTS DOCUMENTATION	Section 1: General Requirements	Concerns over evolving requirements and restrictions to interconnection in large part boil down to seeking greater transparency through the standard.	The Utility shall develop and keep updated an Interconnection Requirements document to detail and communicate Utility-specific interconnection requirements, processes and procedures. The document shall include (but not be limited to) interconnection restrictions, study scope and criteria, Facility technical requirements, expected operating requirements, commissioning and acceptance testing requirements and processes, Utility-specific interconnection policies and procedures, criteria and procedure for Material Modifications. The Utility shall gather stakeholder inputs to the development and revision of the Interconnection Requirements document through an Interconnection Technical Working Group, which shall include representatives from relevant stakeholder groups.

NCSEA Exhibit 3

NC SUSTAINABLE
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I. NCSEA and Member Suggestions

- NCSEA, IREC, and Cypress Creek Renewables submitted this language as a part of the WG2 discussions to help address new technologies such as energy storage and smart inverters.

	Issue Title/ Working Group	NC Interconnection Std reference	Proposed Revision (Narrative or Markup)
1	WG2	6.10 Capacity of the Generating Facility (proposed as 6.10.2)	6.10.2 For the purposes of this Standard, the capacity of the Generating Facility shall be considered the maximum rated capacity of the Generating Facility, except where the gross generating capacity of the Generating Facility is limited (e.g., through the use of a control system, power relay(s), or other similar device settings or adjustments), the Generating Facility's capacity shall be considered the Maximum Generating Capacity specified by the Interconnection Customer in the Interconnection Request. The Maximum Generating Capacity specified by the Interconnection Customer in the Interconnection Request will subsequently be included as a limitation in the Interconnection Agreement.
	WG2	Glossary of Terms	Remove "Net Capacity" definition and replace with: **Maximum Generating Capacity** - The term shall mean the maximum continuous electrical output of the Generating Facility at any time as measured at the Point of Interconnection and the maximum kW delivered to the Utility during any metering period. Requested Maximum Generating Capacity will be specified by the Interconnection Customer in the Interconnection Request and an approved Maximum Generating capacity will subsequently be included as a limitation in the Interconnection Agreement. Also add "maximum generating capacity" to application form

NCSEA Exhibit 4

NC SUSTAINABLE ENERGY ASSOCIATION

Ledford, Peter <peter@energync.org>

Duke Energy to share information on Feasibility Study & System Impact Study

Ledford, Peter <peter@energync.org> Mon, Oct 30, 2017 at 9:39 AM
To: "Gajda, John W" <John.Gajda@duke-energy.com>
Cc: "Dodge, Tim-psncuc" <tim.dodge@psncuc.nc.gov>, "Breitschwerdt, Brett -mcguirewoods" <bbreitschwerdt@mcguirewoods.com>, "Whitaker, Jessica L." <Jessica.Whitaker@duke-energy.com>

John,

Thanks for sending this over, but it's not what I was seeking. On the October 12 call, a Duke representative (I believe it was Jessica, but I could be wrong) said they would share within a week information about ACTUAL timeframes that Duke was experiencing, both on Duke's end and on the developer's end. Taking a line from the spreadsheet you sent:

IR - Technical Modification Material Modification - Customer Decision Due Date 1.5.3 Within 15 BD 1.4 Within 10 BD

I was expecting also to see an "Average Timeframe" column that would indicate that developers take on average 10 days or 20 days (or whatever) to submit their decision.

Please let me know if and when Duke plans to share this information.

Thanks,

Peter
[Quoted text hidden]

NC SUSTAINABLE ENERGY ASSOCIATION

Ledford, Peter <peter@energync.org>

Duke Energy to share information on Feasibility Study & System Impact Study

Breitschwerdt, E. Brett <bbreitschwerdt@mcguirewoods.com> Mon, Oct 30, 2017 at 10:48 AM
To: "Ledford, Peter" <peter@energync.org>, "Gajda, John W" <John.Gajda@duke-energy.com>
Cc: "Dodge, Tim-psncuc" <tim.dodge@psncuc.nc.gov>, "Whitaker, Jessica L." <Jessica.Whitaker@duke-energy.com>, "Fentress, Kendrick C" <Kendrick.Fentress@duke-energy.com>

Peter,

I think there was a good discussion on Friday's call around this topic. My thought is that this information is generally being shared through the utility's Quarterly Reporting and the Company is making good faith efforts to be more responsive and manage the study process in a more transparent manner. With everything else going on, I don't believe this project is the best use of the Duke study team's time.

I appreciate this is likely not the response you were seeking, and I'm glad to discuss further if you have any questions.

BB

From: Ledford, Peter [mailto:peter@energync.org]
Sent: Monday, October 30, 2017 9:39 AM
To: Gajda, John W <John.Gajda@duke-energy.com>
Cc: Dodge, Tim-psncuc <tim.dodge@psncuc.nc.gov>; Breitschwerdt, E. Brett <bbreitschwerdt@mcguirewoods.com>; Whitaker, Jessica L. <Jessica.Whitaker@duke-energy.com>

[Quoted text hidden]

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NCSEA Exhibit 5

NC SUSTAINABLE
ENERGY ASSOCIATION

Working Group #1: Transparency/Communication/Conflict Resolution/Fees

- Transparency
  - What can be done to improve transparency of data? What data can the utilities make available to project developers that would allow developers to better evaluate the viability of a project prior to submitting an interconnection application?
    - Grid data
    - Substation loading
  - Do the utilities have the data to identify locations on the grid where distributed generation can be beneficial? Are the utilities willing to share this data?
- Communication
  - What can be done to improve communication between the utilities and project developers?
    - How are the utilities held accountable for failures to communicate with project developers?
    - Responsiveness to communications from project developers
    - Accounting of deposits from project developers and timely issuance of refunds
    - Website or online portal for project developers to check the status of their projects
- Conflict Resolution
  - Are the conflict resolution procedures working as they should?
    - For project developers?
    - For utilities?
    - For the Public Staff?
- Fees

Working Group #2: New Technologies

- Does the interconnection standard make the best use of the services that can be provided by inverters?
  - California Rule 21
  - Can inverters be better utilized to address issues of in-rush after re-energization?
- How will Duke's grid modernization plan allow for increased deployment of distributed generation?
  - Should interconnection deposits be reduced in light of Duke's expected investment in the grid?
- Does the interconnection standard make the best use of the services that can be provided by distributed generation?
  - How does the interconnection standard interact with other utility planning processes, such as integrated resource planning?

Working Group #3: Studies and Screens

- Are the engineering screens and requirements that have been unilaterally imposed by Duke justified? If so, should they be added to the interconnection standard and how?
    - Circuit Stiffness Review (CSR)
        - Is the CSR threshold set at the appropriate level?
    - Line Voltage Regulator screen
        - Is this impacted by Duke's grid modernization plan?
- If additional engineering screens are necessary in the future, how should those be implemented? What Commission oversight should be necessary?
- Because of the imposition of these screens and requirements, do we really have a good understanding of whether the current interconnection standard is not working?

Working Group #4: Queue Management, Certification of Generating Facilities

- Are structural changes to the interconnection queue necessary?
    - Should separate interconnection queues be established for poultry and swine waste projects?
    - Should a separate interconnection queue, with an expedited review process, be established for projects under 1 MW in capacity (regardless of whether a system is net metered or sell-all)?
    - Should the distribution and transmission queues be merged?
    - Should cluster studies be adopted?
        - If so, how should upgrade costs be divided among projects in the cluster?
    - Are projects being studied out-of-order? If so, how can that be addressed?
- Are the construction standards and post-construction review that have been unilaterally imposed by Duke justified? If so, should they be added to the interconnection standard and how?
- What changes can be made to identify projects that will have economically prohibitive interconnection costs, or other flaws that would render a project unfeasible, earlier in the process?
    - Feasibility studies
    - Pre-application meetings
- What can be done to reduce delays in the interconnection process? What can give project developers certainty about when they will receive study results?
    - Do the deadlines in the interconnection standard need to be changed?
        - For utilities?
        - For project developers?
    - What can be done to require the utilities meet the deadlines in the interconnection standard? How are the utilities held accountable if they fail to meet deadlines? Are penalties necessary for utilities that fail to meet deadlines?
    - What can be done to require project developers respond to utility inquiries in a timely manner?
    - Are the utilities properly staffing their interconnection groups?
        - Are project developers willing to pay larger deposits to allow for increased staffing?

        - Are outside engineers/consultants necessary?
- How to delays in the interconnection process impact other proceedings? How do other proceedings impact the interconnection process?
    - Are changes to the 30-month rule necessary because of the delays in interconnection studies?
- Requirement that additional material modification language be added to engineering drawings
- Is Duke's refusal to allow project developers access to their poles for feeders a good utility practice?
- What can be done to ensure that the utility constructs upgrades in a timely manner?

NCSEA Exhibit 6

DER Planning Guidelines (DEC & DEP)

September 15, 2017 planning guidelines update and transition

DUKE ENERGY.

Objectives of DER Planning Guidelines

- DER Planning Guidelines seek to better manage integration of utility-scale solar consistent with evolving "good utility practice" and to ensure long-term reliability of the transmission & distribution system
- S.L. 2017-192 ("H589") recognizes State's objective to transition to smarter, more cost-effective, and sustainable solar growth strategy than traditional "5 MW on general distribution" policy that has existed from 2012-2016.
- Duke's commitment through H589 to continued solar growth cannot be questioned in light of mandates to interconnect aggregate 7,000+ MW in next 5 years
  - G.S. 62-110.8(b)(1) designed to "guarantee" at least 6,760 MW between legacy "uncontrolled PURPA" and controlled CPRE and Green Source
    - 2,660 MW CPRE within 45 months of NCUC's approval of program
    - If 3,500 MW legacy PURPA not developed by 2022, then any deficiency is added to post 45-month CPRE procurement.
    - If 600 MW Green Source program not fully subscribed by 2022, then any deficiency is added to post 45-month CPRE procurement.
  - H589 also shows new commitment to customer-driven solar adoption though Leasing, Community Solar, and Solar Rebates.
    - DER Planning Guidelines will preserve some system capacity for future customer-sited solar on the distribution system.

Substation Nameplate Policy Impact

Company	Total Distribution Projects in the Queue (MWs)	Total Project Impact (MWs)	"On the Margin" (MWs)	Project Total Not Impacted by Policy (MWs)
DEP	2013	506	40	1507
DEC	641	31	25	610
Total	2654	537	65	2117

Note: "On the Margin" is a subset of the Total Project Impact where a reduced project size would not exceed the Substation Nameplate limit. Duke agrees to allow a downsize and not impact queue priority and the project would retain current rate eligibility

- Under a future CPRE Procurement paradigm, combining the ~ 2,100 MW Project Total Not Impacted by Policy with the ~ 1,990 MW installed as of August 31, 2017 (1,510 MW in DEP and 479 MW in DEC) exceeds the 3,500 MW legacy PUPRA contemplated in CPRE
- In addition, approximately 5,900 MW of projects progressing through combined DEC and DEP transmission queues.

Need for DER Planning Guidelines

- Continued utility-scale penetration on distribution demands a more sustainable & holistic approach
  - Must go beyond consideration of a single interconnection
  - System reliability & power quality negatively impacted if we change the basic "character" of the system (i.e., massive back-feed from distribution back to transmission)

    ("system character" defined here as "underlying and far-reaching system design parameters")
    - e.g. T & D interface assumptions: planning & operations
    - e.g. maximum transformer size, maximum conductor size
- Need an approach that places round pegs in round holes, square pegs in square holes
  - Much like the concept of standard service voltages for customers, based on size
  - Guiding principles are to permit requested interconnections without changing the character of the system

Development of DER Planning Guidelines

- Specifically addressing distribution (& substation) interconnections:
  - How do we allow *some* back feed on distribution and at substation, but assure it doesn't go beyond reasonable limits which today's conventional study methods cannot capture, and without moving to incredibly complex study methods (simultaneous T&D simulation)?

- Establishment of DER Planning Guidelines
  - Develop reasonable DER planning guidelines which allow significant levels of DER on distribution, but also consider when it makes sense to connect direct to the substation or to transmission
  - When shared externally, should help planning activities for developers
  - Good Utility Practice:
    - As unique leader in utility industry in this area, Duke will continue to develop and mature new guidelines which maintain Good Utility Practice for interconnection to the system
    - Continue to pay attention to, and engage with, other utilities on developing practices
      - Active in, and planning increased involvement in, IEEE 1547: P1547, P1547.1; plan involvement in P1547.2 (once underway)
    - Share evolving guidelines with developer community via a technical working group structure
      - To be developed in Q4 2017, or after completion of NC interconnection standards revisions

DER Planning Guidelines, DEC & DEP: Essential components, as of Sept. 2017

1. Analysis of harmonics impacts for low stiffness interconnections (CSR)
2. Location criteria for system compatibility (LVR)
3. Single DER "right size" criteria for connection to distribution, substation, or transmission
   - "10/6/3/2" MW to distribution
   - 20 MW and up to transmission
   - In between: direct-to-substation connection
4. Aggregate DER "right size" criteria for distribution circuits and substations
   - Allow aggregate DER at circuit up to circuit planning capacity
   - Allow aggregate DER at substation up to transformer "nameplate" (ONAN) rating
5. Evolve RVC (rapid voltage change) & flicker criteria

DER Planning Guidelines:
"right-size" criteria for single DER connection to distribution (direct-to-substation), or transmission

Directs the "natural" interconnection method of service, for utility-scale DER, based on facility size: distribution, direct-to-substation, or transmission

Interconnection facility (MVA) (lower limit)	Interconnection facility (MVA) (higher limit)	Interconnection Guideline for system / interconnection point
--	≤ 10 MVA (25 kV or 35 kV class) ≤ 6 MVA (15 kV class) ≤ 3 MVA (where local retail substation is served from 44 kV radial sub-transmission) ≤ 2 MVA (5 kV class)	general **distribution** circuit
> 10 MVA (25 kV or 35 kV class) > 6 MVA (15 kV class) > 3 MVA (where local retail substation is served from 44 kV radial sub-transmission)	< 20 MVA	direct connection to a retail **substation**
≥ 20 MVA	--	**transmission** system

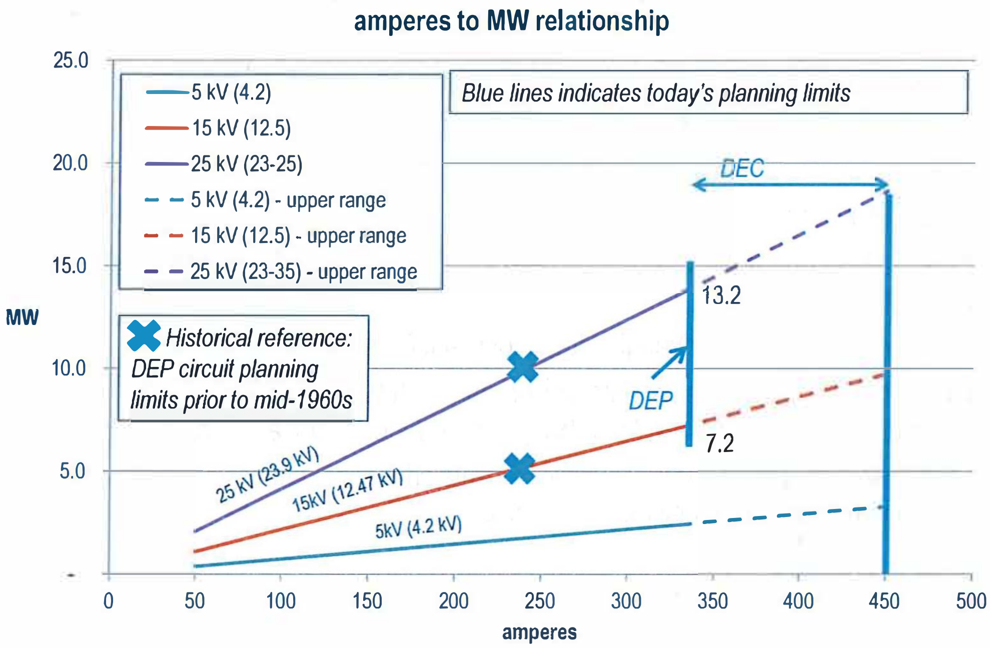
[1] Method "T" interconnections are specifically guided by DEC's or DEP's appropriate FCR (Facility Connection Requirements) documents, which are accessible at DEC's and DEP's OASIS sites (www.oasis.oati.com/duk/ and www.oasis.oati.com/cpl/).
[2] In general, due to the existence of legacy terminology across operating areas, a "retail substation" is the term used within DEC to describe a substation which serves general retail distribution loads from circuits connected to the substation's distribution bus. In this document, the term "retail substation" will be used to describe this type of substation, which in DEP is often called a "T/D" or "T to D" substation.
[3] Interconnections at 5 kV, above 2 MVA, are not permitted. Such facilities must interconnect at a higher voltage class.

DER Planning Guidelines - background
DEC & DEP distribution design basis

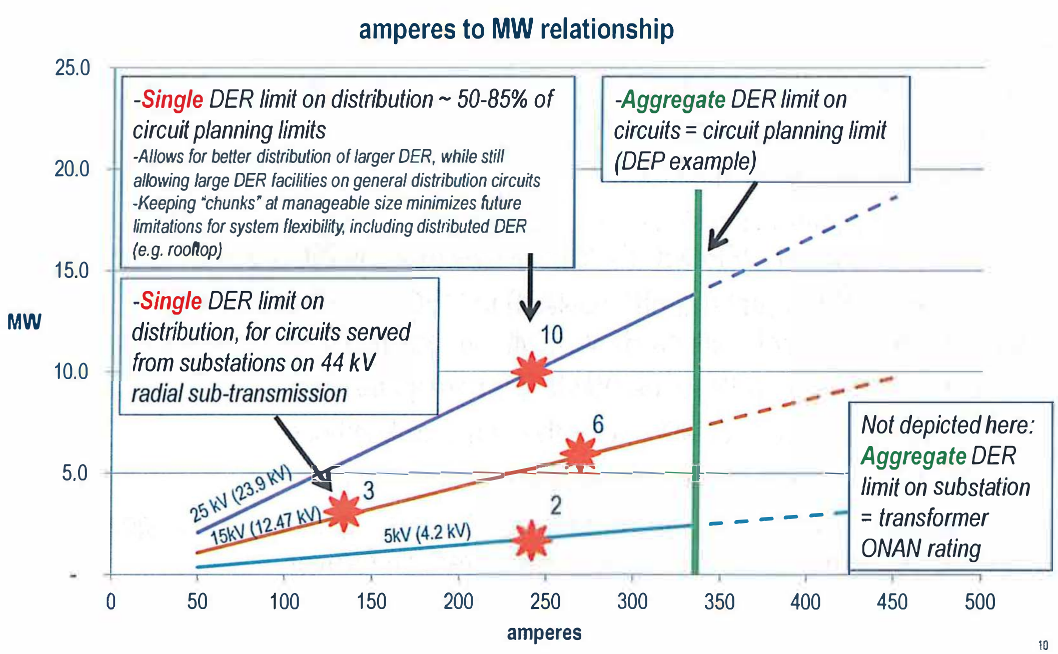
- Most common distribution-class equipment for a "circuit backbone" in DEC and DEP rated for a maximum of 600 amps
  - Common backbone conductor thermal ratings: 480 to 600 amps
  - Overhead line construction design factors (sag, tension, pole height, phase-to-neutral clearance) dictate actual planning limits, typically 300 to close to 500 amps
- DEC and DEP legacy line construction methods and planning philosophies different in several areas; reasons go back 70+ years ago
  - Legacy DEC backbone design planning rating ~ 450 amps (urban/suburban), less in rural areas
    - DEC: varying mixtures of radial sub-transmission (44 kV), standard substation sizes of 6 to 20 MVA (ONAN), and a mixture of 12 kV and 23 kV distribution. Conductor backbone size "right-sized" to local load (size drops multiple times as you get farther from substation); circuit ties may be limited in some areas
    - DEC planning capacities may need to scale back in near future, in order to implement DEC & DEP Self-Optimizing Grid (automated circuit tie) capabilities ("N-1" contingency for radial systems)
  - Legacy DEP backbone design planning rating ~ 330 amps
    - DEP: no radial sub-transmission, standard substation sizes of 15 or 25 MVA (ONAN), and almost exclusively 23 kV distribution with longer circuits. Conductor backbone size often large along whole length to aid in circuit ties, voltage drop, fault reach, etc.

Three recommended textbooks for reference:
- Electric Power Distribution Handbook, by T.A. Short (ISBN 0-8493-1791-6)
- Power Distribution Engineering, by Jim Burke (ISBN 0-8247-9237-8)
- Electric Power Distribution Engineering, Turan Gönen (ISBN-13 978-1-4200-6200-7)

DER Planning Guidelines – background (cont.)
DEC & DEP distribution design basis



DER Planning Guidelines – background (cont.)
DER size criteria, circuit level (single and aggregate)



DER Planning Guidelines – background (cont.)

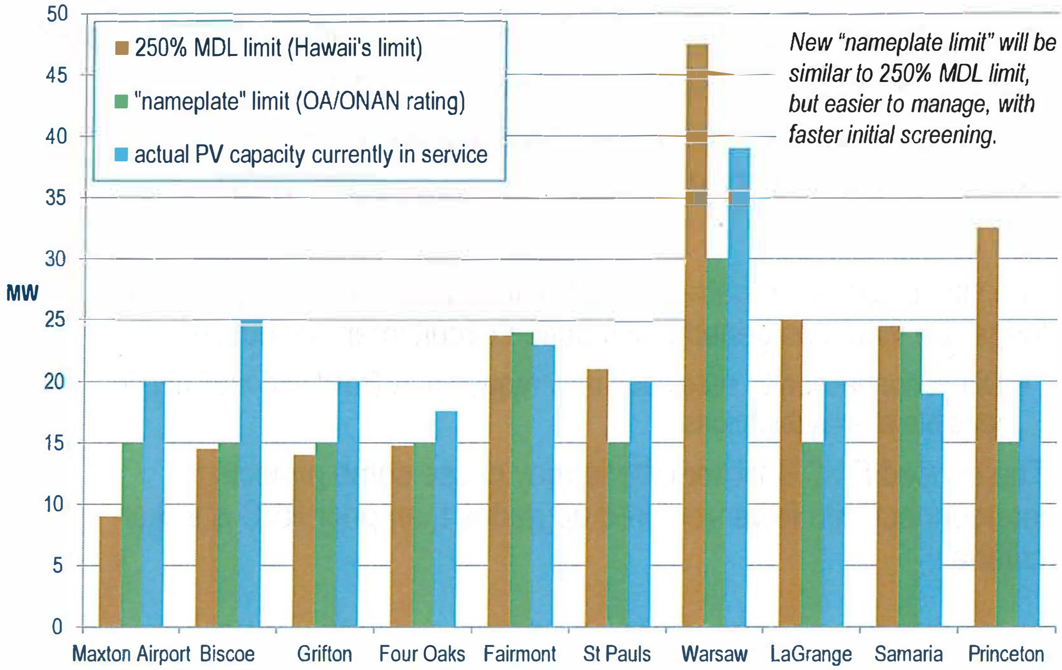
single DER limit of 3 MW,
for circuits/substations served from 44 kV radial sub-transmission

- DEC's 44 kV sub-transmission system exhibits unique characteristics related to utility-scale DER
  - radial (not networked) transmission lines with extended distances
    - presents much higher system impedance than typical
  - serves a number of unregulated customers: industrial and wholesale (muni's, EMCs)
    - impacted by rapidly changing load flows and/or reverse flows
  - Electrically, interconnection here has over 1.6 times the impact of one not served from the 44 kV system, but cannot account for all factors
    - Radial transmission topology still presents challenge: integrated study of transmission & distribution not feasible

DER Planning Guidelines – background (cont.)
DER size criteria, substation level (aggregate)

- Perspective
  - Hawaii is limiting aggregate DER, per circuit, to 250% of minimum daily load (MDL)
  - Changed in 2015 from 120%
  - Almost all residential, net-metered
  - Hawaii has some of the highest distribution circuit or substation penetration levels in the U.S.; however, DEP/DEC rivals or already exceeds 250% of MDL on some circuits
- **"Substation Nameplate Limit" (ONAN) in DEC & DEP** limits DER on a substation to similar levels as Hawaii, without having to research MDL
  - **Limits aggregate DER to the ONAN, or "nameplate" limit**
  - Not the same as a % of MDL, but in the same neighborhood
  - Permits developers better ability to plan
- Unmanaged loading to much higher levels creates significant and ongoing operational and planning challenges which remain forever

DER Planning Guidelines – background (cont.)
DER size criteria, substation level (aggregate)



DER Planning Guidelines: revision of RVC & flicker effect criteria

- RVC (rapid voltage change) & flicker criteria are part of distribution system impact studies
  - In recent past, little in the way of industry standards
  - IEEE P1547 (scheduled for 2018 passage) addresses RVC and flicker
    - Not yet final
    - Uses IEEE 1453 (recommended practice – not required), which many utilities, like Duke Energy, have not yet fully adopted
- Duke recognized, at least back to 2015, that the DEC & DEP RVC & flicker criteria needed to be reviewed for possible revision
  - After some research cooperation with EPRI, NC State, and a survey of other utilities, DEC & DEP will adopt revised RVC & flicker criteria as of 9/15/2017
  - Similar to criteria adopted recently by Xcel Energy
  - Will be known as "DEC & DEP RVC & flicker criteria version 2"

DER Planning Guidelines: Implementation

- Planned transition to revised guidelines, centered around Sept. 15, 2017
- Transparency being stressed for transition of guidelines
  - External release of DER Planning Guidelines document
  - External release of "DER size guidelines implementation matrix" document
- The single and aggregate DER guidelines may cause projects to no longer be viable as general distribution circuit interconnections
  - Direct connection to substation may require new RoW and may not be feasible at all substations
- The revised RVC & flicker criteria may cause some projects to interconnect with fewer required upgrades than prior RVC & flicker criteria

DER Planning Guidelines: Key points – planned transition

- Most urgent item: single DER "right size" guideline
  - For System Impact Studies completed before 9/15/2017 where IA is not yet executed, System Impact Study will be revisited if DER capacity exceeds the applicable **single** DER "right size" guideline (10/6/3/2 MW). System Impact Study will identify the proper interconnection "type" to guide project to general distribution, direct-to-substation, or transmission interconnection. For those studies revisited, revised RVC & flicker criteria version 2 will be used.
- For studies already underway as of 9/15/2017
  - **Single** DER guideline (10/6/3/2) to guide project to general distribution, direct-to-substation, or transmission
  - Revised RVC & flicker criteria version 2 (when prudent)
  - **Aggregate** substation capacity guidelines
- For studies not yet started as of 9/15/2017
  - **Single** DER guideline (10/6/3/2) to guide project to general distribution, direct-to-substation, or transmission
  - Revised RVC & flicker criteria version 2
  - **Aggregate** substation capacity guidelines
  - **Aggregate** circuit capacity guidelines