



**NORTH CAROLINA  
PUBLIC STAFF  
UTILITIES COMMISSION**

October 26, 2021

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

Re: Docket No. EMP-116, Sub 0 – Application of Juno Solar, LLC, for a  
Certificate of Public Convenience and Necessity to Construct a 275-  
MW Solar Facility in Richmond County, North Carolina

Dear Ms. Dunston:

In connection with the above-referenced docket, I transmit herewith for filing on behalf of the Public Staff the testimony and exhibits of Dustin R. Metz, Engineer, Electric Section – Operations and Planning, Energy Division.

By copy of this letter, I am forwarding a copy of the filing to all parties of record by electronic delivery.

Sincerely,

Electronically submitted  
s/ Layla Cummings  
Staff Attorney  
[layla.cummings@psncuc.nc.gov](mailto:layla.cummings@psncuc.nc.gov)

**Attachments**

Executive Director  
(919) 733-2435

Accounting  
(919) 733-4279

Consumer Services  
(919) 733-9277

Economic Research  
(919) 733-2267

Energy  
(919) 733-2267

Legal  
(919) 733-6110

Transportation  
(919) 733-7766

Water/Telephone  
(919) 733-5610



BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. EMP-116, SUB 0

In the Matter of

Application of Juno Solar, LLC, for a  
Certificate of Public Convenience and  
Necessity to Construct a 275-MW Solar  
Facility in Richmond County, North  
Carolina

) TESTIMONY OF  
) DUSTIN R. METZ  
) PUBLIC STAFF – NORTH  
) CAROLINA UTILITIES  
) COMMISSION



**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION**  
**DOCKET NO. EMP-116, SUB 0**

**Testimony of Dustin R. Metz**

**On Behalf of the Public Staff**

**North Carolina Utilities Commission**

**October 26, 2021**

1    **Q.    PLEASE STATE YOUR NAME AND ADDRESS FOR THE**  
2           **RECORD.**

3    A.    My name is Dustin R. Metz. My business address is 430 North  
4           Salisbury Street, Raleigh, North Carolina.

5    **Q.    BRIEFLY STATE YOUR QUALIFICATIONS AND DUTIES.**

6    A.    My qualifications and duties are included in Appendix A.

7    **Q.    WHAT IS YOUR POSITION WITH THE PUBLIC STAFF?**

8    A.    I am an engineer in the Electric Section – Operations and Planning  
9           in the Public Staff's Energy Division.

10   **Q.    WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
11           **PROCEEDING?**

12   A.    The purpose of my testimony is to provide the Commission a review  
13           and final recommendation on the application for a certificate of public



1 convenience and necessity (CPCN) filed by Juno Solar, LLC  
2 (Applicant or Juno) on July 12, 2021 supported by the direct  
3 testimony and exhibits of the Applicant's witness, Piper Miller. In  
4 response to Commission questions issued in its August 31, 2021  
5 Order Scheduling Hearings, Filing of Testimony, Establishing  
6 Procedural Guidelines, and Requiring Public Notice, witness Miller  
7 also filed Supplemental Testimony on September 14, 2021.<sup>1</sup>

8 My testimony has the following sections:

- 9 I. Summary of Testimony
- 10 II. Description of the Facility and Application Review
- 11 III. Transmission Interconnection
- 12 IV. Evaluation of the Applicant's Proposed Conditions
- 13 V. Affected Systems Concerns
- 14 VI. Need for the Facility
- 15 VII. Impact to Rates
- 16 VIII. Public Staff's Recommendations

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<sup>1</sup> Miller Direct and Supplemental Testimony was later filed with portions previously marked confidential unredacted on October 15, 2021 and Exhibit C, Statement of Need, to direct testimony filed unredacted on October 19, 2021.



1 **I. SUMMARY OF TESTIMONY**

2 **Q. PLEASE PROVIDE A SUMMARY OF YOUR TESTIMONY.**

3 Juno proposes to construct a large solar facility (Facility) that would  
4 interconnect to the Duke Energy Progress, LLC (DEP) grid in a  
5 constrained area and will likely trigger substantial network upgrade  
6 costs in DEP, and potentially, other affected systems in the Duke  
7 Energy Carolinas, LLC (DEC) and PJM service territories. Juno  
8 states that there is a need for the project in the state and region, and  
9 that it is in negotiations to sell all of its output to a commercial off-  
10 taker in PJM.<sup>2</sup>

11 DEP has not studied the Juno facility for interconnection, and Juno  
12 plans to enter the Transitional Cluster Study (TCS), DEP's first  
13 cluster study process after the approval of queue reform by the  
14 Federal Energy Regulatory Commission (FERC), this Commission,  
15 and the South Carolina Public Service Commission. The Applicant  
16 contends that the Commission should grant its request for a  
17 conditional CPCN that would terminate if the levelized cost of  
18 transmission (LCOT) calculated, once the network upgrades are  
19 known, is above \$4.00/MWh. Juno does not say at what specific  
20 point in time this condition or the termination of the CPCN would be  
21 triggered. The Applicant also does not go into any detail on the

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<sup>2</sup> Miller Direct, at 13.



1 process for rehearing the application should the termination  
2 provision be triggered and how that may affect other projects in its  
3 study cluster.

4 Juno witness Miller states that the Applicant is caught in a "patently  
5 unfair and unreasonable situation" and a "catch 22" if the  
6 Commission refuses to grant it a CPCN prior to making certain  
7 milestone payments as part of the TCS, which requires the Applicant  
8 to make substantial financial postings, and Juno may incur significant  
9 withdrawal penalties if it exits the study process.

10 I disagree that Juno, or any applicant entering Duke's TCS or  
11 Definitive Interconnection System Impact Study (DISIS), is subject to  
12 an unfair "catch 22". Instead, the Applicant is seeking to shift risk  
13 from itself to DEP ratepayers. This is a risk that was known at the  
14 time the parties, including DEP and Pine Gate Renewables,<sup>3</sup> agreed  
15 to the queue reform process after a lengthy stakeholder process.

16 In addition, the conditional CPCN as requested does not solve the  
17 supposed "catch 22" described by the Applicant. Even if the  
18 Commission grants the CPCN with conditions and the network  
19 upgrades go above the certain defined dollar amount LCOT as

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<sup>3</sup> Pine Gate Renewables is managing the development of Juno Solar's proposed generating facility and will operate Juno in collaboration with Birch Creek. Miller Direct Testimony, at 1.



1 requested by the Applicant, the Applicant is still subject to the same  
2 financial risk of withdrawal from the TCS.

3 The Commission cannot make a fully informed decision on the  
4 Application until it has been studied by the interconnecting utility and  
5 potential affected system costs are known. I recommend that that the  
6 Commission deny the CPCN without prejudice, allowing the  
7 Applicant to refile its Application once it has obtained its Facilities  
8 Study report and once any applicable network upgrades assigned  
9 from affected systems studies are known. Not only will the true LCOT  
10 be unknown prior to these studies, but also the total magnitude of the  
11 network upgrades to ratepayers coming out of the TCS will be  
12 unknown, a factor the Public Staff believes the Commission should  
13 consider when evaluating the need for a facility studied within a  
14 cluster study.

15 **II. DESCRIPTION OF THE FACILITY AND APPLICATION REVIEW**

16 **Q. PLEASE DESCRIBE THE FACILITY.**

17 A. The Applicant proposes to construct a 275-megawatt AC (MW<sub>AC</sub>)  
18 solar photovoltaic electric generating facility in Richmond County,  
19 North Carolina. The Applicant also describes the potential to add  
20 68.75MW / 275MWh of energy storage.<sup>4</sup> The Facility plans to

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<sup>4</sup> Witness Miller states that the Energy Storage System will be subject to change during the design. Miller Direct, at 12, In. 14-15.



1 interconnect with the DEP transmission system via the DEP  
2 Richmond-Laurel Hill 230kV transmission line. The footprint of the  
3 Facility covers approximately 2,600 acres of land, distributed across  
4 multiple parcels.

5 **Q. WHAT IS THE APPLICANT'S PROPOSED CONSTRUCTION**  
6 **TIMELINE FOR THE FACILITY?**

7 Witness Miller states on page 9 of her direct testimony that  
8 construction is expected to begin on the Facility in the second quarter  
9 of 2023, and commercial operation is expected to occur in the third  
10 quarter of 2024. Witness Miller further states that the facility will enter  
11 the TCS. The TCS is the first cluster study set to commence this year  
12 as part of DEP's queue reform effort to move away from an  
13 interconnection serial study process to a cluster study approach that  
14 allows the utility to allocate costs among multiple projects triggering  
15 the need for a system network upgrade. There are multiple phases  
16 to the TCS: Phase 1 is power flow and voltage study, estimated to  
17 be completed by March 1, 2022; Phase 2 is a stability and short  
18 circuit study, estimated to be completed by August 28, 2022; and  
19 finally, a Facilities Study, estimated to be completed by late February  
20 2023. According to DEP, the TCS timeline for study concludes with  
21 the awarding of Interconnection Agreements in 2023, which could be  
22 extended an additional 150 days or more depending on the need for  
23 restudies.



1    **Q.     DID YOU REVIEW THE APPLICANT’S PROPOSED, AND LATER**  
2       **REVISED, SITE PLAN FOR PROPOSED CONSTRUCTION?**

3    A.    Yes. The Applicant revised its proposed site plan, reducing the  
4       overall footprint of the Facility, while maintaining the same nameplate  
5       capacity output, and identifying lowlands or marshlands that would  
6       not be suitable for construction of a solar array or heavy equipment.

7    **Q.     DOES THE REVISED SITE PLAN RAISE ANY CONCERNS, OR**  
8       **DO YOU HAVE ANY OBSERVATIONS THAT YOU WOULD LIKE**  
9       **TO BRING TO THE COMMISSION’S ATTENTION?**

10   A.    Yes, given my experience with the Public Staff reviewing CPCN  
11       applications for solar facilities, it is not uncommon for sites to have  
12       numerous modifications to the site layout and boundaries, and even  
13       changes in nameplate capacity prior to project completion. In this  
14       case, because the Applicant’s proposal to issue the CPCN with a  
15       condition that is dependent on the ability of the facility to produce the  
16       total estimated energy output, a more detailed site map is warranted.

17       Based on my review of the Application and other publically available  
18       topography maps, there are numerous marshland areas, creek beds  
19       and other unusable areas on or near the 2,600 acre site. Should the  
20       proposed site prove incapable of supporting a facility that can  
21       produce the total energy utilized in the initial calculation of the LCOT,



1 the true LCOT may be substantially greater than what is being relied  
2 upon in determining whether to grant the CPCN.

3 The Public Staff has serious concerns that the Applicant, during the  
4 construction process, may experience reasonable, but unexpected  
5 circumstances that will reduce the nameplate capacity and  
6 production profile, and thus cause the true LCOT to dramatically  
7 exceed the LCOT on which the conditional CPCN is based. To  
8 illustrate this concern, see Metz Figure 1 below that evaluated  
9 changes in the LCOT with a different network upgrade costs,  
10 changes in annual capacity factor (energy production), and reduction  
11 in the nameplate rating. I will explain the different network upgrade  
12 costs later in my testimony.

13 **Metz Figure 1**

Network Upgrade Costs (\$M)	13.0	16.8	51.7
	LCOT \$/MWh		
Applicant as filed, 275MW, 40 years @ 25.55% CF	1.01	1.3	4.00
275MW, 40 years @ 23.55% CF (reduction in CF)	1.12	1.44	4.44
250 MW, 40 years @ 25.55% (Reduction in Nameplate)	1.11	1.43	4.40
250 MW, 40 years @ 23.55% (Reduction in Nameplate and CF)	1.23	1.59	4.89

14

15 **Q. DID THE STATE CLEARINGHOUSE HAVE ANY COMMENTS?**

16 A. Yes, the State Clearinghouse filed additional comments on October  
17 15, 2021. The Department of Natural and Cultural Resources  
18 (DNCR) has requested additional information. DNCR noted that it  
19 has sent a previous letter about this project on November 22, 2016



1 recommending a comprehensive archaeological assessment. DNCR  
2 states that it still recommends such an assessment and there are  
3 areas of high probability for archaeological sites. DNCR makes an  
4 additional recommendation to have a cemetery on-site mapped by a  
5 licensed surveyor.

6 **III. TRANSMISSION INTERCONNECTION**

7 **Q. HAS THE APPLICANT PROPOSED TO INTERCONNECT IN A**  
8 **PORTION OF DEP'S SERVICE TERRITORY THAT PREVIOUSLY**  
9 **HAS BEEN IDENTIFIED AS CONSTRAINED (CONGESTED)?**

10 A. Yes. DEP's open access transmission interface, OASIS, website  
11 provides a map as well as a list of individual transmission lines that  
12 are constrained,<sup>5</sup> which I have included as Metz Exhibit 1. Richmond  
13 County, in which the Applicant has requested interconnection, is part  
14 of the red or constrained area. Metz Figure 2 is a detailed view from  
15 Metz Exhibit 1 that focuses in on Richmond County.

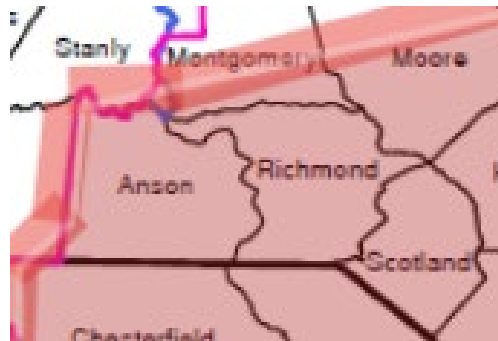
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<sup>5</sup> DEP Constrained Infrastructure, *available at* <https://www.oasis.oati.com/cpl/index.html>, under drop down "Generator Interconnection Information", DEP-DEC Constrained Areas and DEP lines and Subs Constrained Infrastructure (last accessed Oct. 25, 2021).



1

## METZ FIGURE 2



3           Because the constrained area is relatively broad, it is necessary to  
4           evaluate the constrained substation and transmission list, which I  
5           have included in Metz Exhibit 2.<sup>6</sup> In its original Application and  
6           supporting testimony, Juno states that it plans to interconnect to the  
7           (DEP) Richmond-Laurel Hill 230 kV transmission line. Metz Exhibit 2  
8           shows that the Laurinburg-Richmond 230 kV line at the Laurel Hill  
9           Substation is constrained even prior to incorporating Juno's  
10          interconnection request.<sup>7</sup> It is unclear which other projects will  
11          potentially impact this already constrained section of the DEP  
12          system, nor is it clear how many interdependent projects exist in the  
13          interconnection queues, how many of those projects will choose to  
14          enter the TCS, and ultimately complete all phases of the TCS, and  
15          become commercially operational. In addition, DEP has identified

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<sup>6</sup> Constrained Substation and Transmission List, *available at* [https://www.oasis.oati.com/woa/docs/CPL/CPLdocs/DEP\\_Lines and Subs\\_Constrained\\_Infrastructure\\_Tranche\\_2.pdf](https://www.oasis.oati.com/woa/docs/CPL/CPLdocs/DEP_Lines_and Subs_Constrained_Infrastructure_Tranche_2.pdf) (last accessed Oct. 25, 2021).

<sup>7</sup> DEP Constrained Infrastructure, p. 4. Note, all items listed (both red and black text) are constrained sections of the system. The item text in red are new lines and parts of the system that was updated following CPRE Tranche I. There has been no new maps or list updates to Duke's OASIS site following the completion of CPRE Tranche II.



1 multiple other transmission lines and substations in Richmond  
2 County that are already constrained prior to the TCS.

3 **Q. HAS DEP COMPLETED A POWER FLOW OR OTHER**  
4 **GENERATOR INTERCONNECTION STUDY OF THE FACILITY?**

5 A. No. DEP has not completed a power flow analysis for the Facility.<sup>8</sup>  
6 The Public Staff believes that without a power flow analysis done by  
7 the utility based on projects that have entered TCS, and subsequent  
8 system impact study and facilities study, the review of the CPCN is  
9 premature.<sup>9,10</sup>

10 **Q. DID THE APPLICANT COMPLETE ITS OWN POWER FLOW**  
11 **ANALYSIS?**

12 A. Yes. On page 1 of Supplemental Testimony, witness Miller states  
13 that Birch Creek, which owns Juno, performed a steady-state power

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<sup>8</sup> For purposes of my testimony, I am referring to “power flow analysis” as the combination of power flow, voltage and short circuit analysis or other analysis required to interconnect a generation facility, inclusive of affected system studies when applicable.

<sup>9</sup> The Public Staff has taken similar positions in other EMP dockets, either recommending the Commission consider the Application after the network upgrade costs are known or requesting a condition that the Applicant will be responsible for the network upgrade costs that are unknown. See EMP-102, Sub 1, Supplemental Testimony of Metz (Jul. 7, 2021), at 17; EMP-108, Sub 0, Supplemental Testimony of Lucas (Jul. 22, 2020), at 14-15; EMP-109, Sub 0, Testimony of Lucas (May 15, 2020), at 6-7; EMP-110, Sub 0, Supplemental Testimony of Lawrence (Nov. 16, 2020), at 8-10; EMP-111, Sub 0, Testimony of Lucas (Sept. 18, 2020), at 11-12, 19; EMP-114, Sub 0, Testimony of Lawrence (Mar. 22, 2021), at 7-8; EMP-115, Sub 0, Testimony of Lucas (Apr. 14, 2021), at 8-9; EMP-117, Sub 0, Testimony of Lucas (Oct. 19, 2021), at 13-15.

<sup>10</sup> This recommendation is consistent with the Public Staff’s recent Petition for Rulemaking to Revise Commission Rule R8-63 in Docket No. E-100, Sub 176. In that docket, the Public Staff recommends a rule change that would allow the Public Staff to deem merchant generator CPCN applications incomplete without this cost information.



1 flow study. In discovery requests, the Public Staff investigated the  
2 underlying assumptions that Birch Creek utilized.

3 **Q. DID YOU REVIEW THE APPLICANT'S POWER FLOW**  
4 **ANALYSIS?**

5 A. Yes, I did review the Applicant's Power Flow analysis and asked  
6 several questions in discovery. I reviewed their assumptions on the  
7 base case and the change case. After my review, I have two  
8 observations. First, I do not believe that the Applicant can provide an  
9 accurate or useful analysis without knowing with certainty the other  
10 projects that will enter the TCS and remain in the TCS through the  
11 completion of the Phase 2 report, at a minimum. Second, the  
12 Applicant only completed a summer peak power flow analysis. Given  
13 that the Applicant had considered battery storage to be discharged  
14 during the winter peaks, a winter study should be completed and  
15 possibly a shoulder season study.

16 **Q. HAVE YOU PROVIDED TESTIMONY IN OTHER CPCN**  
17 **PROCEEDINGS FOR MERCHANT GENERATION THAT**  
18 **EVALUATED NETWORK UPGRADES?**

19 A. Yes. I have provided testimony in many dockets that discuss network  
20 upgrades, and have worked with other members of the Public Staff  
21 on this subject.



1     **Q.     PLEASE SUMMARIZE YOUR TRANSMISSION ANALYSIS AND**  
2           **THE COMMISSION’S DECISION IN DOCKET NO. EMP-105, SUB**  
3           **0 (FRIESIAN) THAT IS RELEVANT TO THIS PROCEEDING.**

4     A.    In summary, the Public Staff evaluated both the magnitude of  
5           network upgrade costs and the LCOT for the utility to safely  
6           interconnect the facility to a constrained area of DEP’s grid to  
7           maintain reliability. The LCOT metric is a straightforward tool that  
8           allowed consideration of the required upgrades and their respective  
9           costs to the transmission system on a unit of energy conversion  
10          basis.

11          The Commission in the Friesian case did not consider the LCOT as  
12          a definitive test with pass or fail criteria; the Commission considered  
13          it as a benchmark of reasonableness of the costs to interconnect  
14          generation. The total magnitude of the upgrades, \$223.5 million,  
15          informed the total rate impact of the facility to DEP ratepayers, which  
16          was also an important consideration.

17          While the specifics of the Public Staff’s review of Friesian’s  
18          application were unique to the facts and circumstances of that facility,  
19          the sheer magnitude of the network upgrade costs and the relatively  
20          high LCOT weighed heavily towards the Public Staff’s  
21          recommendation to deny the CPCN. In the Public Staff’s view,  
22          interconnection of the Friesian facility would result in costly



1 overbuilding and inefficient planning of the transmission system and  
2 was, therefore, not in the public interest. The existence of a  
3 completed System Impact Study and Facilities Study report was  
4 crucial to the Public Staff's ability to make its final recommendation;  
5 however, the Juno Facility does not currently have these studies.

6 I would further note that in the Friesian case, the estimated costs of  
7 the network upgrades increased even after the Facilities Study, and  
8 then decreased again.<sup>11</sup> In its June 11, 2020 Order denying the  
9 certificate, the Commission stated "[r]ather than assuage the  
10 Commission, the various swings in the estimated cost of the network  
11 upgrades raise further concern."<sup>12</sup> It is possible that Juno and its  
12 cluster will have similar swings in cost estimates and that, in the  
13 Public Staff's view, is another reason the Commission should wait for  
14 the results of interconnection studies prior to issuing a CPCN.

15 Furthermore, whatever the costs are to interconnect Friesian at this  
16 point in time<sup>13</sup> is potentially relevant in this proceeding if Friesian  
17 enters the TCS and is in a cluster study with Juno's Facility.

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<sup>11</sup> See Late Filed Exhibit, Docket No. EMP-105, Sub 0, filed by DEP on January 8, 2020, and corrected supplemental late-filed exhibit filed on April 16, 2020.

<sup>12</sup> Order Denying Certificate for Merchant Generating Facility (Friesian Final Order), Docket EMP-105, Sub 0 (N.C.U.C. June 11, 2020) at 24, fn. 8.

<sup>13</sup> Due to the passage of time, Friesian would likely have to be studied again whether it enters Transitional Cluster or Transitional Serial Study.



1    **Q.     PLEASE SUMMARIZE YOUR MOST RECENT TRANSMISSION**  
2           **ANALYSIS IN DOCKET NO. EMP-102, SUB 1 (PITT SOLAR).**

3    A.     While Pitt Solar is still pending before the Commission, and the  
4           specifics of that application are unique to it, the crux of my evaluation  
5           in that case was to inform the Commission that without a completed  
6           Affected System study, I could not calculate the transmission impacts  
7           and provide a recommendation to the Commission.

8    **Q.     MR. METZ, HAS THE PUBLIC STAFF MADE SIMILAR**  
9           **RECOMENDATIONS TO THE COMMISSION RECENTLY?**

10   A.     Yes. As we learn more about the complexities of increasing amounts  
11          of generation in specific constrained sections of the transmission  
12          system, it is necessary to scrutinize the potential ramifications of the  
13          upgrades, costs, and commensurate value to rate payers to ensure  
14          long term efficient planning while providing reliable service at  
15          affordable rates. I believe this Commission's review of merchant  
16          generator applications and the total cost of construction of those  
17          facilities, especially network upgrade costs that are ultimately passed  
18          on to ratepayers, is key to ensuring the statutory goals of N.C.G.S. §  
19          62-110.1 are met.



1     **IV.     EVALUATION OF THE APPLICANT’S PROPOSED CONDITIONS**

2     **Q.     THE APPLICANT REQUESTS A CONDITIONAL CPCN. CAN YOU**  
3     **DESCRIBE THOSE CONDITIONS?**

4     A.     Yes. The Applicant requests the Commission issue a conditional  
5           CPCN that allows network upgrades up to a certain LCOT amount,  
6           after allocation among multiple TCS projects. If that amount is  
7           exceeded, witness Miller proposes that “CPCN will automatically  
8           terminate and be of no further force and effect unless Juno Solar  
9           requests further proceedings to consider whether the CPCN should  
10          not be terminated, in which case the CPCN will not be terminated  
11          unless so ordered by the Commission.”<sup>14</sup>

12    **Q.     UNDER THE APPLICANT’S ASSUMPTIONS OF THE**  
13    **TRANSMISSION ESTIMATES, PLEASE DESCRIBE HOW THE**  
14    **COMMISSION COULD EVALUATE THESE COSTS.**

15    A.     Using the Applicant’s assumptions, the network upgrades would cost  
16           \$13 million (assumed to be the assigned cost to the Facility by the  
17           Applicant’s power flow analysis), and in a worst-case scenario,  
18           \$16.84 million. In this scenario, 100% of the cost was assigned to  
19           Juno assuming no other projects were allocated a part of the  
20           estimated upgrade costs or those projects subsequently withdrew

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<sup>14</sup> Miller Direct, at 24.



1 from the study process.<sup>15</sup> The magnitude would equate to a LCOT  
2 range of \$1.00/MWh to \$1.30/MWh (See Metz Figure 1), assuming  
3 Juno's generation output occurs at its planned levels, the final  
4 construction costs are equal to the estimates and no affected system  
5 costs are triggered. Under these assumptions, the Public Staff would  
6 agree that the costs are reasonable in both magnitude and LCOT.  
7 However, the network upgrade costs for the facility should not be  
8 reviewed in isolation, but rather, in context of other facilities likely to  
9 interconnect in the same cluster.

10 **Q. IF THE APPLICANT'S TRANSMISSION ESTIMATE ASSUMED A**  
11 **~\$1.00/MWH LCOT, WHY IS THE APPLICANT REQUESTING A**  
12 **\$4.00/MWH LCOT CONDITION?**

13 A. Witness Miller states that a \$4.00/MWh LCOT "represents the  
14 amount that Birch Creek believes to be a just and reasonable  
15 threshold which will serve to facilitate the state and Duke's renewable  
16 energy goals while not burdening ratepayers with reimbursement of  
17 unduly high network upgrade costs."<sup>16</sup> Witness Miller does not

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<sup>15</sup> Once all the required studies are complete, inclusive of affected system impacts when applicable, projects will be assigned their respective cost responsibility for transmission upgrades. For illustrative purposes, assume that a specific transmission upgrade of \$10M was identified and there are four projects of 20MW, 10MW, 5MW, and 1MW for a total of 36MW. The \$10M would be assigned to each of the projects based on their MW rating. 20MW project would be assigned 55.55% (20MW of the single facility divided 36MW of the total aggregated facilities triggering the upgrade) of the costs or roughly \$5.55M. The 10MW project = \$2.78M, 5MW project = \$1.39M, 1MW project = \$0.28M.

<sup>16</sup> Miller Direct, at 3.



1 provide any analysis for the total impact this would have to  
2 ratepayers if applied to other merchant plant CPCN applications or  
3 how merchant generators wheeling power into PJM will help Duke or  
4 the State meet its renewable energy goals. Just for the Facility,  
5 however, \$4.00/MWh represents an approximate total of \$51.7  
6 million in upgrade costs that will be reimbursed by DEP ratepayers  
7 pursuant to Duke's Open Access Transmission Tariff (OATT)  
8 regardless of whether that power benefits North Carolina ratepayers  
9 or not.

10 **Q. HAVE YOU EVER TESTIFIED THAT THE LCOT CRITERIA IS THE**  
11 **ONLY PASS OR FAIL TEST FOR A MERCHANT POWER**  
12 **GENERATION PLANT, OR ANY CPCN APPLICATION FOR THAT**  
13 **MATTER?**

14 A. No, I have never testified that the LCOT is a pass/fail test and I am  
15 not doing so here. I am advocating that the LCOT is a factor to be  
16 considered along with the total magnitude of the costs, as I have  
17 every other time LCOT has been evaluated. Furthermore, the need  
18 for the power in the State and the region must also be balanced  
19 against that cost and long term planning for the state.



1     **Q.     DO YOU HAVE ANY CONCERNS ABOUT THE LCOT PROPOSED**  
2           **BY THE APPLICANT?**

3     A.     The methodology Juno has used to calculate LCOT based on its  
4           steady-state power flow study is consistent with the Public Staff's  
5           methodology used in other proceedings. However, I believe that the  
6           proposal fails to address the total magnitude of the upgrades for all  
7           the projects in the TCS. Also, the proposal does not provide a  
8           justification outside of the LBNL study benchmarks for how granting  
9           the CPCN based upon an LCOT of \$4.00/MWh or less allows the  
10          Commission to take into account methods for providing reliable,  
11          efficient, and economical electric service. <sup>17</sup>

12    **Q.     DO YOU HAVE CONCERNS WITH A CONDITIONAL CPCN WITH**  
13          **CONTINUED INCREASES IN TRANSMISSION CONSTRUCTION**  
14          **ESTIMATES, AND CAN YOU EXPLAIN WHY A PHASE 1 POWER**  
15          **FLOW ANALYSIS TO DETERMINE A LCOT IS PROBLEMATIC?**

16    A.     Yes. My concerns are reflected in witness Miller's supplemental  
17          testimony, in which she acknowledges industry trends leading to  
18          rising transmission costs, stating "transmission costs have generally  
19          risen, due to: 1) increasing materials and labor costs, and 2) the  
20          tendency of these costs to increase with increased solar penetration

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<sup>17</sup> N.C.G.S. § 62-110.1(d) states "[i]n acting upon any petition for the construction of any facility for the generation of electricity, the Commission shall take into account the applicant's arrangements with other electric utilities for interchange of power, pooling of plant, purchase of power and other methods for providing reliable, efficient, and economical electric service."



1 on the system.”<sup>18</sup> The Public Staff conducted discovery on this topic,  
2 and found the Applicant’s response to be thorough, responsive, and  
3 illustrative of why a conditional CPCN based on any power flow cost  
4 estimate is premature prior to receiving a Facilities Study report. In  
5 response to Data Request 2-11 related to witness Miller’s statement  
6 above, Juno states (emphasis added):

7 The statement that interconnection costs have risen is  
8 based on industry observation and is not one that can  
9 be readily demonstrated on a project-to-project basis,  
10 as each project has its own unique interconnection  
11 requirements. Birch Creek has, however, observed  
12 systematically underestimated interconnection costs  
13 from the point of System Impact Study (“SIS”) to  
14 Facilities Study (“FS”), where it is not unusual of late to  
15 see FS cost estimates **roughly doubling the**  
16 **corresponding estimates made during the SIS**  
17 **phase**, including projects studied by DEP and DEC.

18 Rising hard costs and labor costs across the nation  
19 presumably impact all interconnection costs. The  
20 Employment Cost Index maintained by the Bureau of  
21 Labor Statistics reflected a year-over-year increase of  
22 2.6% as of the last quarter, and many commodity costs  
23 have risen steadily since early 2020, with steel  
24 commodity costs in particular seeing an over 200%  
25 price increase since March 2020 and contributing  
26 substantially to rising costs of electrical infrastructure.

27 Furthermore, in the Friesian docket, DEP filed a late  
28 filed exhibit on January 8, 2020 to explain the reason  
29 for the increase in cost estimate for the network  
30 upgrades from \$116 million (Initial Estimate) to \$224.4  
31 (IA Estimate). DEP provided information that the  
32 increase in costs is not applicable to just the Friesian

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<sup>18</sup> Miller Supplemental, at 3.



1 project, but applies generally to transmission projects.  
2 DEP provided the following information:

- 3 • Labor costs – As was discussed extensively during  
4 the hearing, there has been an increase in labor  
5 costs for this type of work. This updated labor cost  
6 information was then used to develop a more  
7 refined estimate of the per mile labor costs that led  
8 to the updated estimate.
- 9 • Environmental costs – Similarly, the Company  
10 continues to experience increased costs for  
11 environmental compliance and such increased  
12 costs were factored into the IA Estimate. For  
13 instance, the Company's experience with more  
14 recent projects has demonstrated that matting  
15 costs (a significant cost item) were often far greater  
16 than initial estimates.

17 **Q. DO YOU AGREE WITH THE APPLICANT THAT ENTERING THE**  
18 **TCS (OR DISIS) WITHOUT A CPCN CREATES A “PATENTLY**  
19 **UNFAIR AND UNREASONABLE SITUATION” FOR THE**  
20 **APPLICANT?**

21 A. No. I do not agree that it is unfair or unreasonable, and it is extremely  
22 challenging to make a recommendation that relies solely on the  
23 LCOT for an acceptable or unacceptable amount of reasonableness.  
24 The TCS is a voluntary process for the transformation of serial  
25 studies to large-scale cluster studies. The construct of the TCS and  
26 the DISIS occurred through a stakeholder process, which  
27 determined the phases, milestones payments, withdrawal penalties,  
28 and timing requirements. This process was approved by the North  
29 Carolina Utilities Commission, the Public Service Commission of



1 South Carolina, and the Federal Energy Regulatory Commission.  
2 The Public Staff believes that solar developers will have a fair  
3 opportunity to participate in this process. A CPCN is not required to  
4 meet any readiness milestones and the Facility, and others similarly  
5 situated, can apply for a CPCN once the process has concluded.

6 **V. AFFECTED SYSTEMS CONCERNS**

7 **Q. PLEASE IDENTIFY ANY CONCERNS YOU HAVE WITH**  
8 **AFFECTED SYSTEMS STUDIES AND THE TCS.**

9 A. An Affected System (AS) is an adjacent utility to the interconnecting  
10 utility, in this case DEP, where the output of a generation facility  
11 located in DEP negatively impacts the AS (i.e., causes overloads or  
12 other reliability issues). Each Balancing Area reviews its own  
13 respective interconnection queues to determine whether or not it is  
14 an AS. Neither TCS nor DISIS is a joint modeling exercise between  
15 DEP and DEC. AS studies between DEP and DEC will be treated  
16 similarly to how PJM and DEP coordinate AS studies, as has been  
17 discussed extensively in other pending dockets before this  
18 Commission.

19 I have multiple concerns related to the AS study process because:  
20 (1) the Facility's production profile will match that of the current large  
21 solar capacity and energy in DEP, (2) the Facility will interconnect in  
22 a constrained area, and (3) the Facility is in close proximity to the



1 DEC system. The Facility, along with others nearby, will likely trigger  
2 a need to evaluate the DEC-DEP tie lines to identify potential  
3 upgrades in the DEC system.<sup>19</sup> While other adjacent utilities are  
4 further away from the Facility than DEC, those utilities could be AS's  
5 as well. Thus, projects in PJM and their respective power flows will  
6 have to be evaluated in conjunction with the TCS as well.<sup>20</sup>

7 The Public Staff sent a data request to Duke to ask about the  
8 coordination of AS studies and the TCS. Duke's Large Generator  
9 Interconnection Agreement (LGIA) governs the AS Study process.<sup>21</sup>  
10 Duke explained in response to a data request that:

11 Coming into Phase 1, Juno Solar will not have any  
12 indication of affected system requirements or cost,  
13 since the project will not have been studied. After the  
14 release of the Phase 1 Study results but before the end  
15 of Phase 2 customer engagement, Juno Solar would  
16 be notified that an affected system study may be  
17 required. However, the timeline does not support  
18 receiving affected system requirements and cost  
19 before Phase 2 milestones are due. The preferred  
20 timeline would be for affected system studies to occur  
21 during the Phase 2 Study so that the costs and  
22 requirements would be known before posting M3  
23 milestones prior to Facilities Study. In the case where  
24 a potential affected system was identified during Phase  
25 2 study, this may not be possible.<sup>22</sup>

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<sup>19</sup> This is heavily dependent on what is the base case scenario and what generation is added in the change case.

<sup>20</sup> In supplemental testimony, witness Miller identifies PJM but not DEC as a potential affected system. Miller Supplemental, at 4.

<sup>21</sup> Affected Systems Business Procedure for Duke Energy, *available at* [https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/Affected\\_Systems\\_Business\\_Procedure\\_v2\\_final.pdf](https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/Affected_Systems_Business_Procedure_v2_final.pdf) (last accessed Oct. 25, 2021).

<sup>22</sup> Response of DEP to Public Staff DR 1-8.



1 A project or multiple projects could be in both the TCS and the LGIA  
2 AS study processes, at the same time with each process having its  
3 own estimated network upgrade costs. Duke has a goal to complete  
4 an AS study within 60-90 days (but the LGIA does not have definitive  
5 completion timelines but has goals with a degree of flexibility). Once  
6 the studies are complete, the LGIA and TCS processes are moving  
7 in parallel and the project, if it triggers a network upgrade on an  
8 affected system, will have to enter to an Affected System Operating  
9 Agreement with the affected utility and establish milestone payments  
10 and timelines.

11 **VI. NEED FOR THE FACILITY**

12 **Q. DID YOU EVALUATE THE APPLICANT'S STATEMENT OF NEED**  
13 **FOR THE GENERATION FACILITY?**

14 A. Yes. The Applicant stated a need for the generation output of this  
15 facility in PJM given PJM's expected load growth. The Public Staff  
16 asked the Applicant to describe in more detail how North Carolina  
17 consumers and the North Carolina electrical system needed this  
18 facility:

19 Birch Creek anticipates that this project will "wheel" the  
20 majority of its output to PJM, which will primarily  
21 provide clean energy benefits to the Dominion system  
22 including the portion of North Carolina included in its  
23 footprint. Moreover, the volume of clean energy to be  
24 produced by Juno Solar would substantially displace  
25 existing CO<sub>2</sub>-emitting resources, in turn facilitating  
26 regional decarbonization consistent with North



1 Carolina's clean energy policy goals. Juno also  
2 anticipates selling a portion of its generation on an "as-  
3 available" basis to DEP when not economic or feasible  
4 to charge its battery or deliver it to PJM, directly  
5 providing the utility and state with additional clean  
6 energy toward their respective targets.<sup>23</sup>

7 Through discovery, the Applicant has stated, the "[p]roject will remain  
8 incentivized to discharge energy from the battery storage system  
9 during these winter morning peak hours [6am to 8am]".<sup>24</sup>

10 **Q. WITNESS MILLER STATED IN HER DIRECT TESTIMONY THAT**  
11 **ALL SIX SCENARIOS OF DEP'S 2020 INTEGRATED RESOURCE**  
12 **PLAN (IRP) RESULT IN INCREASED SOLAR AND STORAGE**  
13 **CAPACITY ON THE DEP SYSTEM. IS IT YOUR**  
14 **UNDERSTANDING THAT PLAN A OF THE 2020 IRP DID NOT**  
15 **ECONOMICALLY SELECT ANY NEW SOLAR OR SOLAR PLUS**  
16 **BATTERY STORAGE IN THE 15-YEAR PLANNING HORIZON?**

17 **A.** Yes. Plan A did not economically select any new solar, or solar plus  
18 battery storage in addition to the mandated solar or expected PURPA  
19 queue materialization that is required by law at the time of the filing  
20 of the 2020 IRP.

21 **Q. WILL THE FACILITY DISPLACE ANY CARBON EMITTING**  
22 **GENERATION?**

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<sup>23</sup> Response to Public Staff Data Request 1-8.

<sup>24</sup> Response to Public Staff Data Request 1-10.



1     A.     There is no evidence, at this time, that the Facility will or will not  
2           displace carbon emitting resources. Energy and capacity are needed  
3           for continued load growth, as well as for retiring generation (carbon  
4           emitting or not), so the output of any new generation facility may just  
5           be incremental energy added to the system to meet load growth and  
6           may or may not contribute to dependable capacity depending on  
7           whether the energy storage system will be dispatched at the time of  
8           need. The broad assertion that it will displace carbon-emitting  
9           resources is not convincing, as there was not an evaluation provided  
10          to it would displace carbon-emitting resources in DEP or PJM.

11    **Q.     IS THERE ANY OTHER REASON NON-CARBON EMITTING**  
12          **GENERATION WOULD BE NEEDED IN THE STATE OR**  
13          **REGION?**

14    A.     In the time since the Applicant filed testimony, the General Assembly  
15           enacted a new law, S.L. 2021-165 or H951. This law requires the  
16           Commission to develop a Carbon Plan and take all reasonable steps  
17           to reduce emissions by 70% over 2005 levels by 2030. This will  
18           undoubtedly lead to the retirement of fossil fuel units and require  
19           procurement of new non-carbon emitting generation on the Duke  
20           Energy system to serve load. At this point, however, prior to the  
21           development of the Carbon Plan, it is premature to assume that the  
22           Facility would be needed to assist in meeting those goals. The law is  
23           technology agnostic and the Carbon Plan must comply with current



1 law and practice with regard to least cost planning for generation in  
2 achieving carbon reduction goals and determining the generation  
3 and resource mix.

4 **Q. WOULD YOU AGREE THAT PJM HAS IDENTIFIED THE NEED**  
5 **FOR NEW GENERATION, BOTH ENERGY AND CAPACITY?**

6 A. Yes. However, PJM would need to evaluate the current  
7 interconnection queues and the historic PJM capacity markets to  
8 identify if there is truly a short fall of new projects to meet its needs.  
9 The PJM interconnection queue, inclusive of Virginia and North  
10 Carolina, has voluminous amounts of generation, particularly carbon  
11 free generation, seeking to interconnect. Given the interconnection  
12 queues, I find it doubtful that PJM energy and capacity needs are  
13 dependent on the Facility.

14 Based on my review of the PJM interconnection queue, the Applicant  
15 has not demonstrated the need for the Facility or that it has to be  
16 located in the DEP service territory to serve PJM.



1

2 **Q. DID YOU REVIEW THE 2021 PJM LOAD FORECAST REPORT?**

3 A. Yes, I did.<sup>25</sup> PJM is expecting peak load growth of 0.3% for the next  
4 10 years and 0.2% over the next 15 years, with a summer forecasted  
5 peak of 153,759 MW in 2031 and winter forecasted peak of 135,568  
6 MW in 2030/2031. However, compared to the 2020 PJM Load  
7 Forecast, the summer peak will decreased 1.5%, a reduction of  
8 2,209 MW in study year 2026. It is noteworthy that page 33 of the  
9 report (listed as page 28), shows the Dominion (DOM) Zone is  
10 shifting to a winter peak and winter load growth is nearly double that  
11 of summer load growth. In comments to FERC on the Advance  
12 Notice of Proposed Rulemaking for transmission planning, Dominion  
13 stated:

14 As of October 2021, approximately 47,640 MW of  
15 renewable energy is currently in the PJM queue for the  
16 DOM Zone. Of 568 projects in the PJM queue for the  
17 DOM Zone, only 6 are for the development and  
18 interconnection of non-renewable resources, i.e., 562  
19 are for the development and interconnection of  
20 intermittent renewable projects.<sup>26</sup>

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<sup>25</sup> PJM 2021 Load Forecast Report, *available at* <https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx> (January 2021).

<sup>26</sup> Comments of Dominion Energy Services, Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection, FERC Docket No. RM21-17-000 (Oct. 12, 2021), at 16.



## VII. IMPACT TO RATES

**Q. SIMILAR TO THE PUBLIC STAFF'S ANALYSES OF FRIESIAN, DID YOU EVALUATE THE RATE IMPACT OF THIS PROJECT?**

**A.** Yes. I requested a rate impact analysis from DEP in this case. DEP provided the rate impacts to customer classes for increases in transmission costs, similar to that which a merchant power plant would trigger.

Table 1 below illustrates the calculation needed to estimate impacts to NC Retail and Wholesale Rates.

**Table 1. Rate Impact Calculator Assuming No Network Upgrade Costs**

Network Upgrades (\$mm)	\$0	<i>\$mm+ FERC Interest 5yrs@3.25%</i>
Depreciation Rate:	2.23%	<i>60 years (NC-1001)</i>
Property Tax Rate	0.36%	<i>NC-1001</i>
DEP WACC (Pre-Tax)	8.44%	<i>DEP Settlement</i>
Carry Cost	11.03%	
Revenue Requirement	\$0.00	
Book Revenues	\$3,921	<i>E2 sub 1219 Compliance Exhibit #2 (col_J+col_N)</i>
DEP Retail Transmission Allocation	59.67%	<i>DEP-COS NC Retail Demand Allocation (NC-1001)</i>
<b>NC Retail Rate Impact</b>	<b>0.00%</b>	
OATT Net Rev Requirement (\$mm)	\$240.5	<i>Formula Rates pg1 line 8</i>
Wholesale Transmission Allocation	32.36%	<i>Formula Rates pg5 line 6</i>
<b>Wholesale Transmission Impact</b>	<b>0.00%</b>	



1 Q. USING THE CALCULATIONS IN TABLE 1, PLEASE LIST THE NC  
2 RETAIL AND WHOLESALE IMPACTS USING THE COSTS  
3 LISTED IN YOUR TESTIMONY.

4     A.     I put multiple costs into the Network Upgrades field and my results  
5           are displayed in Table 2, below. The results provide a perspective on  
6           the magnitude of the cost and the associated impact to rates for both  
7           North Carolina retail and wholesale customers if the Facility triggers  
8           upgrades and the cost of the upgrades are reimbursed to the  
9           Applicant.

10 **Table 2: Rate Impacts**

\$(M)	NC Retail Rate Impact	Wholesale Rate Impact	Notes
13	0.02%	0.59%	The Applicant's assumed assigned cost
16	0.03%	0.73%	The Applicant's assumed total cost
51	0.09%	2.29%	Equivalent \$4.00 LCOT

11

A 2.29% increase to wholesale rates at the assumed \$4.00/MWh LCOT scenario is noteworthy, when compared to the percent in change resulting from the Facility in isolation. When factoring in the total network upgrades that may or may not be included for all projects in the TCS, the percent increase will be much higher.

17 This analysis accounts for upgrades that may be required in the DEP  
18 service territory. There may also be additional AS costs. Any analysis  
19 of need for the Facility should also take into account the need on the



1 affected system if it is determined that network upgrades are  
2 triggered on a neighboring utility's system.

3 **VIII. PUBLIC STAFF'S RECOMMENDATION ON THE CONDITIONAL**  
4 **CPCN APPLICATION**

5 **Q. FOR THE PURPOSES OF THIS APPLICATION, DOES THE**  
6 **PUBLIC STAFF AGREE WITH A CONDITIONAL CPCN?**

7 A. Not in this case. The Public Staff frequently recommends the  
8 granting of CPCN applications with conditions. We believe, however,  
9 that it is premature in the development process to consider  
10 conditional CPCNs for facilities based on a predetermined LCOT cap  
11 before the facility has been properly studied. We also believe that the  
12 Applicant has failed to present sufficient reasons why the  
13 Commission must act before system network upgrade cost estimates  
14 are available.

15 In the Friesian case, the Commission found that it is appropriate to  
16 consider the total cost of siting a generating facility, and that the  
17 CPCN statute obligates the Commission to analyze the long-range  
18 needs for expansion of facilities to achieve maximum efficiencies.<sup>27</sup>  
19 Consistent with that decision, the Public Staff recommends that the

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<sup>27</sup> Friesian Final Order, at 17, *citing* N.C.G.S. § 62-110.1(c).



1 Commission consider the Facility once it has more certain cost  
2 information.

3 Other than the unknown magnitude of costs associated with the TCS  
4 and any affected systems costs, the Applicant's requested condition  
5 presents other problems. The upcoming TCS will be the first of its  
6 kind for generating facilities in the Duke balancing areas. The Public  
7 Staff is concerned that if the costs go over the predetermined  
8 conditional threshold, withdrawals and delays may occur while the  
9 Commission rehears the CPCN application at the request of the  
10 Applicant. Complaints regarding the process may occur at the end of  
11 the multiyear study and undermine the results of the TCS.

12 Furthermore, the Public Staff believes that the Applicant is shifting  
13 risk from itself, unjustly, onto captive ratepayers, based on a metric  
14 that can be greatly changed if the Facility changes its design (i.e.,  
15 the use of a battery) or reduces its nameplate capacity prior to  
16 commercial operation or even over the life of the project. The Facility  
17 is in a known transmission constrained area of the DEP system, and  
18 high network upgrade costs are likely. The risk should remain with  
19 the Applicant, who will profit from the development of the Facility,  
20 especially if it contracts to sell output outside of DEP.



1    **Q.    PLEASE EXPLAIN FURTHER, WHY THE TIMING OF THE**  
2           **CONDITION WITH EITHER AN AUTOMATIC TERMINATION OR**  
3           **FURTHER HEARINGS AT THE COMMISSION GIVES YOU**  
4           **CONCERN.**

5    A.    In discovery, the Public Staff asked Juno when the study process the  
6           \$4.00/MWh LCOT condition should be evaluated, and the  
7           Applicant's response stated, "Birch Creek believes it is appropriate  
8           that Juno's CPCN no longer be conditioned at the point of execution  
9           of an Interconnection Agreement."<sup>28</sup>

10          There are specific timelines and milestones that have to be met in  
11          the TCS process.<sup>29</sup> Those timelines and payments were determined  
12          after a robust stakeholder process and may be impacted by any  
13          Commission proceedings (or automatic CPCN terminations) that  
14          cause a project to withdraw. Juno will be awaiting the results of that  
15          an AS study in parallel to the TCS process, and any affected system

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<sup>28</sup> Applicant Response to Public Staff DR 1-21.

<sup>29</sup> The Public Staff has determined the following timeline for the TCS based on Duke's Queue Reform presentations available on OASIS and filings in the interconnection docket:

Readiness Establishment Window (60 days): Sep. 1 to Oct. 31, 2021

Customer Engagement Window (30 days): Nov. 1 to Nov. 30, 2021

Phase 1 Power Flow/Voltage (90 days): Dec. 1 to March 1, 2022

Issuance of Phase 1 Study Report (30 days to Phase 2 deposit)- March 31, 2022

Phase 2 Stability and Short Circuit (150 days) : April 1 to Aug. 28, 2022

Issuance of Phase 2 Study Report (30 days to Facilities Study Deposit)

[Possible Phase 3 restudy-of required add 150 days]

Individual Facilities Study (150 days): September 27, 2022 through Feb. 24, 2023

Issuance of Facilities Study Report: Feb. 24, 2023

[Phase 3 restudy potentially takes the timeline out to August of 2023]

See Duke Energy Queue Reform Stakeholder Meeting Presentation, available at [https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/Duke\\_Energy\\_Queue\\_Reform\\_Stakeholder\\_Meeting\\_Presentation- March\\_16\\_2021.pdf](https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/Duke_Energy_Queue_Reform_Stakeholder_Meeting_Presentation- March_16_2021.pdf) (last accessed Oct. 25, 2021).



1 study costs would have to be calculated in determining the Facility's  
2 LCOT. These two study processes are not aligned which will make it  
3 difficult to determine the timing to enforce the proposed LCOT cap  
4 and the impact that would have on other projects in the TCS.<sup>30</sup>

5 **Q. WHAT IS THE PUBLIC STAFF'S FINAL RECOMMENDATION?**

6 A. The Public Staff requests that the Commission deny the application  
7 at this time, without prejudice, and allow the Applicant to refile once  
8 it has more certain cost information. We specifically request that the  
9 Applicant refile the application no earlier than after a completed  
10 Facilities Study from the TCS process, and a completed AS, if  
11 applicable.

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<sup>30</sup> Public Staff Comments on Queue Reform, August 31, 2020, Docket No. E-100, Sub 101, first state our concerns with the coordination of affected systems studies. On page 8, the comments state:

In addition, the Public Staff notes that due to increasing activity for large merchant generation seeking transmission interconnection into PJM in the DENC service territory, several of DEP's transmission lines near the DENC system have been identified as being impacted or "affected" by the interconnection customers participating in PJM's cluster-based transmission study process.

The Public Staff has recently raised concerns regarding the timing and allocation of these affected system costs in comments and testimony it has filed in merchant applications for certificates of public convenience and necessity. The Public Staff notes that these affected system studies must also be aligned with Duke's queue reform measures to ensure that the upgrades identified in an affected system are appropriately included in the baselines for Duke's own cluster study process, and that the cost allocation provisions applicable to affected system projects are revised to be consistent with Duke's efforts to assign costs to those projects that contribute to the need for the network upgrades.



1           It is the Public Staff's view that the schedule of the TCS process  
2           allows adequate time for an uncontested CPCN review process. If  
3           obtaining the CPCN causes delays in the construction timeline, the  
4           Applicant also has the option of filing a motion for limited construction  
5           authority.

6   **Q.     DOES THIS CONCLUDE YOUR TESTIMONY?**

7   A.     Yes, it does



## **QUALIFICATIONS AND EXPERIENCE**

DUSTIN R. METZ

Through the Commonwealth of Virginia Board of Contractors, I hold a current Tradesman License certification of Journeyman and Master within the electrical trade, awarded in 2008 and 2009 respectively. I graduated from Central Virginia Community College, receiving Associates of Applied Science degrees in Electronics and Electrical Technology (Magna Cum Laude) in 2011 and 2012 respectively, and an Associates of Arts in Science in General Studies (Cum Laude) in 2013. I graduated from Old Dominion University in 2014, earning a Bachelor of Science degree in Engineering Technology with a major in Electrical Engineering and a minor in Engineering Management.

I have over 12 years of combined experience in engineering, electromechanical system design, troubleshooting, repair, installation, commissioning of electrical and electronic control systems in industrial and commercial nuclear facilities, project planning and management, and general construction experience, including six years with direct employment with Framatome, where I provided onsite technical support, craft oversight, engineer change packages and participated in root cause analysis teams at commercial nuclear power plants, including plants owned by both Duke and Dominion.



I joined the Public Staff in the fall of 2015. Since that time, I have worked on general rate cases, fuel cases, applications for certificates of public convenience and necessity, service and power quality, customer complaints, North American Electric Reliability Corporation (NERC) Reliability Standards, nuclear decommissioning, National Electric Safety Code (NESC) Subcommittee 3 (Electric Supply Stations) member, avoided costs and PURPA, interconnection procedures and power plant performance evaluations; I have also participated in multiple technical working groups and been involved in other aspects of utility regulation.

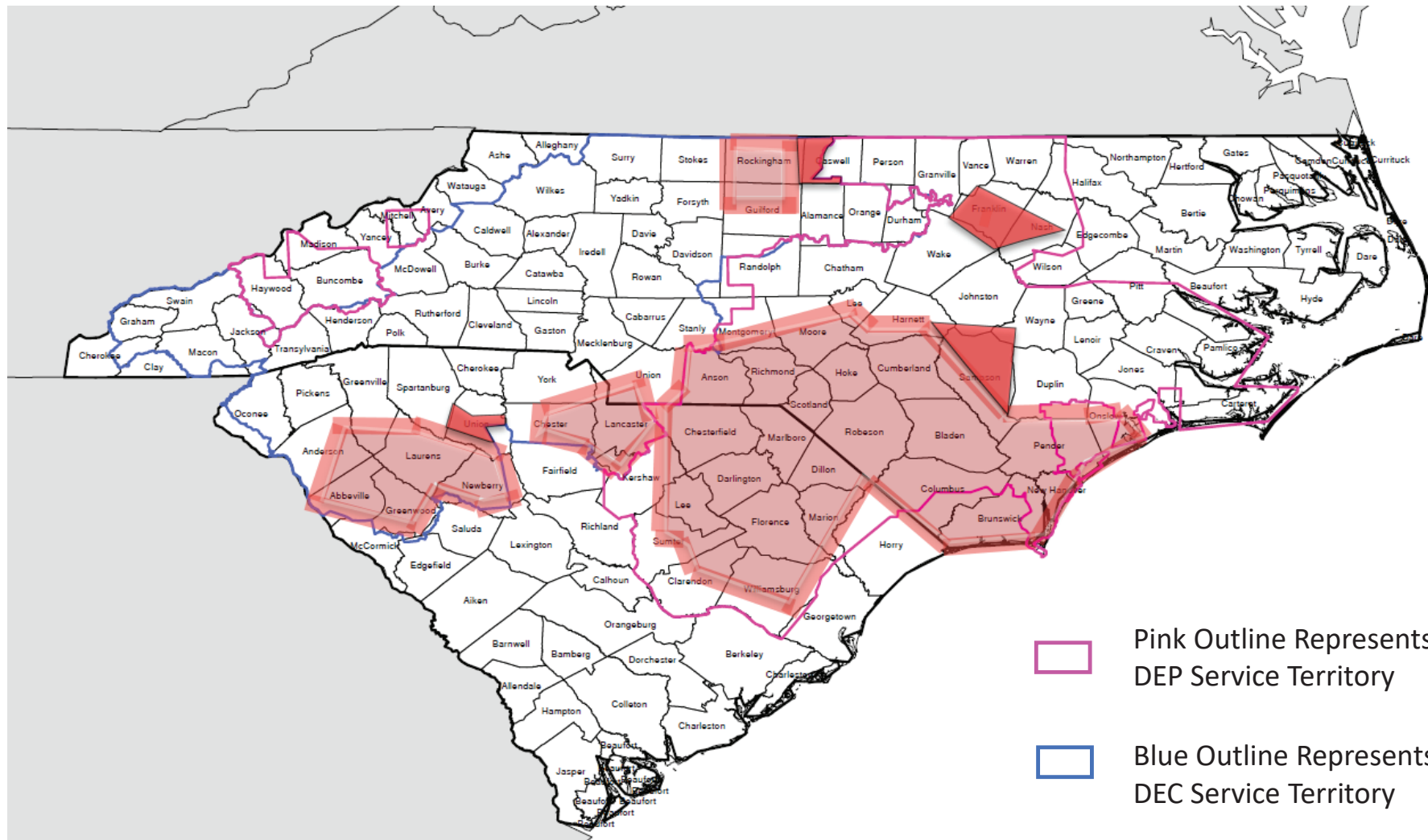






## Metz Exhibit 1

### DEC and DEP Constrained Areas – Tranche 2









## Metz Exhibit 2

### DEP Constrained Infrastructure

Line Name	kV	Substation	Type
Barnard Creek - Carolina Beach 115kV Feeder	115	Carolina Beach	T-D
Barnard Creek - Carolina Beach 115kV Feeder	115	Wilmington River Road	T-D
Barnard Creek - Town Creek Overhead 230kV	230	-	-
Barnard Creek - Town Creek UG 230kV	230	-	-
Barnard Creek - Wilmington Corning SS 230kV	230	Wilmington Cedar Ave	T-D
Barnard Creek - Wilmington Corning SS 230kV	230	Wilmington Corning	T-D
Barnard Creek - Wilmington Corning SS 230kV	230	Wilmington Winter Park	T-D
Barnard Creek - Wilmington Sunset Park 115kV Feeder	115	Wilmington Sunset Park	T-D
Bennettsville SS - Laurinburg 230kV	230	McColl	T-D
Biscoe - Rockingham 230kV	230	Rockingham Aberdeen Rd	T-D
Blewett Falls Plant - Rockingham 115kV	115	Rockingham West	T-D
Blewett Falls Plant - Tillery Plant 115kV	115	-	-
Brunswick Plant Unit 1 - Castle Hayne 230kV East	230	Brunswick EMC Daws Creek POD	POD
Brunswick Plant Unit 1 - Castle Hayne 230kV East	230	Masonboro	T-D
Brunswick Plant Unit 1 - Castle Hayne 230kV East	230	Wilmington Ogden	T-D
Brunswick Plant Unit 1 - Castle Hayne 230kV East	230	Wrightsville Beach	T-D
Brunswick Plant Unit 1 - Delco 230kV East	230	Brunswick EMC Bolivia POD	POD
Brunswick Plant Unit 1 - Delco 230kV East	230	Southport 230	T-D
Brunswick Plant Unit 1 - Delco 230kV East	230	Southport ADM	T-D
Brunswick Plant Unit 1 - Delco 230kV East	230	Southport Cogentrix	Gen
Brunswick Plant Unit 1 - Jacksonville 230kV	230	Jones-Onslow EMC Meadowview POD	POD
Brunswick Plant Unit 1 - Jacksonville 230kV	230	Rocky Point	T-D
Brunswick Plant Unit 1 - Weatherspoon Plant 230kV	230	-	-
Brunswick Plant Unit 2 - Delco 230kV West	230	Brunswick EMC Southport POD	POD
Brunswick Plant Unit 2 - Town Creek 230kV	230	-	-
Brunswick Plant Unit 2 - Wallace 230kV	230	-	-
Brunswick Plant Unit 2 - Whiteville 230kV	230	Brunswick EMC Prospect POD	POD
Cape Fear Plant - West End 230kV	230	Central EMC Center Church POD	POD
Cape Fear Plant - West End 230kV	230	Sanford Garden St	T-D
Cape Fear Plant - West End 230kV	230	Sanford Horner Blvd	T-D
Cape Fear Plant - West End 230kV	230	Sanford US1	T-D
Castle Hayne - Folkstone 115kV	115	Holly Ridge	T-D
Castle Hayne - Folkstone 115kV	115	Jones-Onslow EMC Folkstone POD	POD
Castle Hayne - Folkstone 115kV	115	Jones-Onslow EMC Hugh Batts POD	POD
Castle Hayne - Folkstone 115kV	115	Jones-Onslow EMC Morris Landing POD	POD
Castle Hayne - Folkstone 115kV	115	Jones-Onslow EMC Topsail POD	POD
Castle Hayne - Folkstone 115kV	115	Vista	T-D
Castle Hayne - Wallace 115kV	115	Burgaw	T-D
Castle Hayne - Wallace 115kV	115	Castle Hayne Carolinas Cement	T-D
Castle Hayne - Wallace 115kV	115	Wilmington Elementis	T-D
Castle Hayne - Wilmington Corning SS 230kV	230	-	-
Clinton - Mt. Olive 115kV	115	Faison Highway Industrial	T-D
Clinton - Mt. Olive 115kV	115	South River EMC Hargrove POD	POD
Clinton - Mt. Olive 230kV	230	-	-
Clinton - Vander 115kV	115	Roseboro	T-D
Clinton - Vander 115kV	115	South River EMC Roseboro POD	POD

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Clinton - Vander 115kV	115	South River EMC Stedman POD	POD
Clinton - Vander 115kV	115	Vander DAK	T-D
Cumberland - Delco 230kV	230	Four County EMC Kelly POD	POD
Cumberland - Delco 230kV	230	Four County EMC York POD	POD
Cumberland - Delco 230kV	230	Garland	T-D
Cumberland - Delco 230kV	230	Rowan Creek Solar	Gen
Cumberland - Delco 230kV	230	Turnbull Creek Solar	Gen
Cumberland - Fayetteville 230kV North	230	-	-
Cumberland - Fayetteville 230kV South	230	-	-
Cumberland - Richmond 500kV	500	-	-
Cumberland - Wake 500kV	500	-	-
Cumberland - Whiteville 230kV	230	Bladenboro Solar	Gen
Cumberland - Whiteville 230kV	230	Four County EMC Powell POD	POD
Cumberland - Whiteville 230kV	230	Four County EMC Tarheel POD	POD
Darlington County Plant - Bennettsville SS 230kV	230	Bennettsville Sub	T-D
Darlington County Plant - Bennettsville SS 230kV	230	Society Hill	T-D
Darlington County Plant - Florence 230kV	230	-	-
Darlington County Plant - Robinson Plant 230kV North	230	-	-
Darlington County Plant - Robinson Plant 230kV South	230	-	-
Darlington County Plant - SCPSA South Bethune 230kV	230	-	-
Darlington County Plant - Sumter 230kV	230	Bishopville	T-D
Darlington County Plant - Sumter 230kV	230	Sumter Alice Drive	T-D
Darlington County Plant - Sumter 230kV	230	Sumter North	T-D
Darlington County Plant - Sumter 230kV	230	Sumter Wedgefield Road	T-D
Delco - Riegelwood Intl Paper 115kV Feeder	115	Riegelwood Intl Paper	T-D
Delco - Whiteville 115kV	115	Brunswick EMC Hallsboro POD	POD
Delco - Whiteville 115kV	115	Brunswick EMC South Whiteville POD	POD
Delco - Whiteville 115kV	115	Lake Waccamaw	T-D
Delco - Whiteville 115kV	115	Whiteville 115	T-D
Erwin - Fayetteville 115kV	115	Beard	T-D
Erwin - Fayetteville 115kV	115	Erwin Mills	T-D
Erwin - Fayetteville 115kV	115	Fayetteville Slocomb	T-D
Erwin - Fayetteville 115kV	115	Godwin	T-D
Erwin - Fayetteville 115kV	115	South River EMC Beard POD	POD
Erwin - Fayetteville 115kV	115	South River EMC Wade POD	POD
Erwin - Fayetteville East 230kV	230	Linden	T-D
Fayetteville - Fayetteville Dupont SS 115kV	115	Fayetteville DuPont	T-D
Fayetteville - Fayetteville Dupont SS 115kV	115	Hope Mills Church St	T-D
Fayetteville - Fayetteville Dupont SS 115kV	115	Roslin Solar	Gen
Fayetteville - Fayetteville Dupont SS 115kV	115	South River EMC Grays Creek POD	POD
Fayetteville - Fayetteville East 230kV	230	-	-
Fayetteville - Ft. Bragg Woodruff St. 230kV	230	Clifdale	T-D
Fayetteville - Ft. Bragg Woodruff St. 230kV	230	Fayetteville PWC Reilly Rd POD	POD
Fayetteville - Ft. Bragg Woodruff St. 230kV	230	Fort Bragg Knox St	T-D
Fayetteville - Ft. Bragg Woodruff St. 230kV	230	Fort Bragg Main	T-D
Fayetteville - Ft. Bragg Woodruff St. 230kV	230	Sandhills Utilities Knox St POD	POD
Fayetteville - Raeford 230kV	230	Hope Mills Rockfish Rd	T-D

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Fayetteville - Rockingham 230kV	230	Hamlet	T-D
Fayetteville - Rockingham 230kV	230	Shoe Heel Creek Solar	Gen
Fayetteville - Vander 115kV North	115	South River EMC Vander POD	POD
Fayetteville - Vander 115kV South	115	Vander DAK	T-D
Fayetteville East - Ft. Bragg Woodruff St. 230kV	230	-	-
Florence - Florence Mount Hope 115kV Feeder	115	Florence Mt Hope	T-D
Florence - Florence Roche Carolinas 115kV	115	Florence Mars Bluff	T-D
Florence - Kingstree 230kV	230	Florence Cashua	T-D
Florence - Kingstree 230kV	230	Florence Ebenezer	T-D
Florence - Kingstree 230kV	230	Kingstree North	T-D
Florence - Kingstree 230kV	230	Lake City	T-D
Florence - Kingstree 230kV	230	Olanta	T-D
Florence - Kingstree 230kV	230	Sardis	T-D
Florence - Latta 230kV	230	-	-
Florence - Marion 115kV	115	Florence Burch's Crossroads	T-D
Florence - Marion 115kV	115	Florence General Electric	T-D
Florence - Marion 115kV	115	Florence Johnson Controls	T-D
Florence - Marion 115kV	115	Florence L-TEC	T-D
Florence - Marion 115kV	115	Florence South	T-D
Florence - SCPSA Darlington 230kV	230	Florence West	T-D
Florence Dupont - Florence Roche Carolinas 115kV	115	-	-
Florence Dupont - Marion 115kV	115	Marion Bypass	T-D
Florence Dupont - SCPSA Hemingway 115kV	115	Florence Stone Container	T-D
Florence Dupont - SCPSA Hemingway 115kV	115	Hemingway 115	T-D
Florence Dupont - SCPSA Hemingway 115kV	115	Hemingway Tupperware	T-D
Florence Dupont - SCPSA Hemingway 115kV	115	Pamplico 115	T-D
Florence Dupont - SCPSA Hemingway 115kV	115	Pamplico Delta Mills	T-D
Folkstone - Jacksonville City 115kV	115	Jacksonville Blue Creek	T-D
Folkstone - Jacksonville City 115kV	115	Jones-Onslow EMC Morton POD	POD
Folkstone - Jacksonville City 115kV	115	Jones-Onslow EMC Southwest POD	POD
Franklinton - Spring Hope 115kV	115	Franklinton Novo	T-D
Franklinton - Spring Hope 115kV	115	Louisburg 115	T-D
Franklinton - Spring Hope 115kV	115	Louisburg Fox Creek Solar	Gen
Franklinton - Spring Hope 115kV	115	Spring Hope Sub	T-D
Franklinton - Spring Hope 115kV	115	Stallings Crossroads	T-D
Franklinton - Spring Hope 115kV	115	Wake EMC Louisburg POD	POD
Ft. Bragg Woodruff St - Richmond Sub 230kV	230	Fort Bragg Longstreet Rd	T-D
Ft. Bragg Woodruff St - Richmond Sub 230kV	230	Sandhills Utilities Fort Bragg 3rd Brigade POD	POD
Ft. Bragg Woodruff St. - Manchester 115kV Feeder	115	Central EMC Spout Springs POD	POD
Ft. Bragg Woodruff St. - Manchester 115kV Feeder	115	South River EMC Eureka Springs POD	POD
Ft. Bragg Woodruff St. - Manchester 115kV Feeder	115	South River EMC Manchester POD	POD
Harris Plant - Ft. Bragg Woodruff St. 230kV	230	Central EMC Docs Rd POD	POD
Harris Plant - Ft. Bragg Woodruff St. 230kV	230	Spring Lake	T-D
Kingstree - Andrews 115kV Feeder	115	Andrews	T-D
Kingstree - Sumter 115kV	115	Alcolu Grant	T-D
Kingstree - Sumter 115kV	115	Manning	T-D
Latta - Marion 230kV	230	-	-

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Laurinburg - Libbey Owens Ford 115kV North	115	Libbey Owens Ford	T-D
Laurinburg - Libbey Owens Ford 115kV North	115	Lumbee River EMC Laurinburg POD	POD
Laurinburg - Libbey Owens Ford 115kV South	115	-	-
Laurinburg - Raeford 115kV	115	Maxton Airport	T-D
Laurinburg - Raeford 115kV	115	Maxton Solar	Gen
Laurinburg - Raeford 115kV	115	Wagram JP Stevens	T-D
Laurinburg - Richmond 230kV	230	Laurel Hill	T-D
Laurinburg - Richmond 230kV	230	Laurinburg City	T-D
Lee - Mt. Olive 115kV	115	Mt. Olive 115	T-D
Lee - Mt. Olive 115kV	115	Mt. Olive Industrial	T-D
Lee - Mt. Olive 115kV	115	Mt. Olive West	T-D
Lee - Mt. Olive 115kV	115	Tri-County EMC Dudley POD	POD
Lee - Mt. Olive 115kV	115	Tri-County EMC Genoa POD	POD
Lee - Mt. Olive 115kV	115	Tri-County EMC Mt. Olive POD	POD
Lee - Mt. Olive 230kV	230	-	-
Lilesville - DPC Oakboro 230kV Black	230	Ansonville	T-D
Lilesville - DPC Oakboro 230kV White	230	-	-
Lilesville - Rockingham 230kV Black	230	-	-
Lilesville - Rockingham 230kV South	230	-	-
Lilesville - Rockingham 230kV White	230	-	-
Marion - SCPSA Marion 230kV North	230	-	-
Marion - SCPSA Marion 230kV South	230	-	-
Marion - Whiteville 115kV	115	Brunswick EMC Cherry Grove POD	POD
Marion - Whiteville 115kV	115	Brunswick EMC Tabor City POD	POD
Marion - Whiteville 115kV	115	Chadbourn	T-D
Marion - Whiteville 115kV	115	Fair Bluff	T-D
Marion - Whiteville 115kV	115	Mullins	T-D
Marion - Whiteville 115kV	115	Nichols	T-D
Marion - Whiteville 115kV	115	Tabor City	T-D
Marion - Whiteville 115kV	115	Whiteville GA Pacific	T-D
Marion - Whiteville 115kV	115	Whiteville SE Regional Park	T-D
Marion - Whiteville 230kV	230	Brunswick EMC Chadbourn-Peacock POD	POD
Raeford - Lumbee River EMC Rockfish 115kV Feeder	115	Lumbee River EMC Arabia POD	POD
Raeford - Lumbee River EMC Rockfish 115kV Feeder	115	Lumbee River EMC Rockfish POD	POD
Raeford - Raeford 115kV Feeder	115	Lumbee River EMC Raeford POD	POD
Raeford - Raeford 115kV Feeder	115	Raeford 115	T-D
Raeford - Raeford 115kV Feeder	115	Raeford South	T-D
Raeford - Richmond 230kV	230	-	-
Richmond - DPC Newport 500kV	500	-	-
Richmond - Rockingham 230kV East	230	-	-
Richmond - Rockingham 230kV West	230	-	-
Robinson Plant - Camden Junction 115kV	115	Bethune	T-D
Robinson Plant - Florence 115kV	115	Darlington 115	T-D
Robinson Plant - Florence 115kV	115	Darlington Pineville Road	T-D
Robinson Plant - Florence 115kV	115	Hartsville 115	T-D
Robinson Plant - Florence 230kV	230	Dovesville Nucor	T-D
Robinson Plant - Rockingham 115kV	115	Cheraw 115	T-D

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Robinson Plant - Rockingham 115kV	115	Chesterfield	T-T
Robinson Plant - Rockingham 115kV	115	Cordova Burlington Ind	T-D
Robinson Plant - Rockingham 115kV	115	Hartsville Sonoco	T-D
Robinson Plant - Rockingham 115kV	115	Jefferson	T-D
Robinson Plant - Rockingham 115kV	115	Pageland	T-D
Robinson Plant - Rockingham 115kV	115	Sneedsboro Solar	Gen
Robinson Plant - Rockingham 230kV	230	Cheraw Cash Road	T-D
Robinson Plant - Rockingham 230kV	230	Cheraw Reid Park	T-D
Robinson Plant - SCPSA Darlington 230kV	230	Hartsville Segars Mill	T-D
Robinson Plant - Sumter 230kV	230	Elliott	T-D
Rockingham - Rockingham 115kV Tie	115	Pee Dee EMC Rockingham POD	POD
Rockingham - Rockingham 115kV Tie	115	Rockingham 115	T-D
Rockingham - West End 230kV East	230	Pee Dee EMC Derby POD	POD
Rockingham - West End 230kV East	230	West End	T-D
Rockingham - West End 230kV West	230	Eden Solar	Gen
Rockingham - West End 230kV West	230	Ellerbe	T-D
Rockingham - West End 230kV West	230	Pee Dee EMC Patterson POD	POD
Rockingham - West End 230kV West	230	Wadesboro 230	T-D
Rockingham - West End 230kV West	230	Wadesboro Bowman School	T-D
Rocky Mount - Spring Hope 115kV	115	Nashville	T-D
Spring Hope - Zebulon 115kV	115	Frazier Solar	Gen
Spring Hope - Zebulon 115kV	115	Samaria	T-D
Sutton Plant - Castle Hayne 115kV North	115	Castle Hayne	T-D
Sutton Plant - Castle Hayne 115kV South	115	-	-
Sutton Plant - Castle Hayne 230kV	230	Murraysville	T-D
Sutton Plant - Castle Hayne 230kV	230	Wilmington East	T-D
Sutton Plant - Castle Hayne 230kV	230	Wilmington Ninth & Orange	T-D
Sutton Plant - Delco 115kV North	115	Delco 115	T-D
Sutton Plant - Delco 115kV South	115	Brunswick EMC Wilmington POD	POD
Sutton Plant - Delco 115kV South	115	Eagle Island	T-D
Sutton Plant - Delco 115kV South	115	Leland 115	T-D
Sutton Plant - Delco 115kV South	115	Leland Industrial	T-D
Sutton Plant - Delco 115kV South	115	Wilmington Atlantic Scrap Metal	T-D
Sutton Plant - Delco 115kV South	115	Wilmington PCS/LA Pacificorp	T-D
Sutton Plant - Delco 230kV	230	-	-
Sutton Plant - Wallace 230kV	230	Wilmington BASF	T-D
Sutton Plant - Wallace 230kV	230	Wilmington Invista	T-D
Sutton Plant - Wallace 230kV	230	Wilmington Praxair	T-D
Sutton Plant - Wilmington GNF 115kV Feeder	115	Wilmington GNF	T-D
Weatherspoon Plant - Delco 115kV	115	Bladenboro Sub	T-D
Weatherspoon Plant - Delco 115kV	115	Clarkton	T-D
Weatherspoon Plant - Delco 115kV	115	Elizabethtown Cogentrix	Gen
Weatherspoon Plant - Delco 115kV	115	Elizabethtown Sub	T-D
Weatherspoon Plant - Delco 115kV	115	Kings Bluff	T-D
Weatherspoon Plant - Fayetteville 230kV	230	County Line Solar	Gen
Weatherspoon Plant - Fayetteville Dupont SS 115kV	115	Fayetteville DuPont	T-D
Weatherspoon Plant - Fayetteville Dupont SS 115kV	115	Fayetteville Solar	Gen

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Weatherspoon Plant - Fayetteville Dupont SS 115kV	115	St Pauls	T-D
Weatherspoon Plant - Latta 230kV	230	Dillon Maple	T-D
Weatherspoon Plant - Latta 230kV	230	Dillon North	T-D
Weatherspoon Plant - Laurinburg 230kV	230	City of Lumberton POD #3	POD
Weatherspoon Plant - Laurinburg 230kV	230	Rowland	T-D
Weatherspoon Plant - Laurinburg 230kV	230	Weatherspoon Sub	T-D
Weatherspoon Plant - Libbey Owens Ford 115kV	115	Butler	T-D
Weatherspoon Plant - Libbey Owens Ford 115kV	115	Lumbee River EMC Pembroke POD	POD
Weatherspoon Plant - Libbey Owens Ford 115kV	115	Lumbee River EMC West Lumberton POD	POD
Weatherspoon Plant - Libbey Owens Ford 115kV	115	Maxton 115	T-D
Weatherspoon Plant - Lumberton 115kV	115	City of Lumberton POD #4	POD
Weatherspoon Plant - Lumberton 115kV	115	Lumberton 115	T-D
Weatherspoon Plant - Lumberton 115kV	115	Lumberton Cogentrix	Gen
Weatherspoon Plant - Marion 115kV	115	Dillon 115	T-D
Weatherspoon Plant - Marion 115kV	115	Fairmont	T-D
Weatherspoon Plant - Marion 115kV	115	Lumbee River EMC Hog Swamp POD	POD
Weatherspoon Plant - Raeford 115kV	115	City of Lumberton POD #2	POD
Weatherspoon Plant - Raeford 115kV	115	Lumbee River EMC Red Springs POD	POD
Weatherspoon Plant - Raeford 115kV	115	Lumbee River EMC Rennert POD	POD
Weatherspoon Plant - Raeford 115kV	115	Red Springs	T-D
Weatherspoon Plant - Raeford 115kV	115	Shannon	T-D
West End - Pinehurst 115kV Feeder	115	Pinehurst	T-D
West End - Southern Pines 115kV Feeder	115	Carthage	T-D
West End - Southern Pines 115kV Feeder	115	Lakeview	T-D
West End - Southern Pines 115kV Feeder	115	Randolph EMC Eastwood POD	POD
West End - Southern Pines 115kV Feeder	115	Southern Pines 115	T-D
West End - Southern Pines Center Park 115kV Feeder	115	Aberdeen	T-D
West End - Southern Pines Center Park 115kV Feeder	115	Southern Pines Center Park	T-D
-	-	Barnard Creek	T-T
-	-	Bennettsville SS	T-T
-	-	Biscoe	T-T
-	-	Blewett Falls Plant	T-T
-	-	Brunswick Plant Unit 1	T-T
-	-	Brunswick Plant Unit 2	T-T
-	-	Camden Junction	T-T
-	-	Castle Hayne	T-T
-	-	Clinton 230	T-T
-	-	Cumberland	T-T
-	-	Darlington County Plant	T-T
-	-	Delco 230	T-T
-	-	Erwin 115	T-T
-	-	Fayetteville 230	T-T
-	-	Fayetteville Dupont SS	T-T
-	-	Florence 230	T-T
-	-	Florence Dupont	T-T
-	-	Florence Roche Carolinas	T-T
-	-	Folkstone	T-T

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## DEP Constrained Infrastructure

-	- Franklinton 115	T-T
-	- Ft. Bragg Woodruff St.	T-T
-	- Harris Plant	T-T
-	- Jacksonville 230	T-T
-	- Jacksonville City	T-T
-	- Kingtree 230	T-T
-	- Latta	T-T
-	- Laurinburg 230	T-T
-	- Libbey Owens Ford	T-T
-	- Lilesville	T-T
-	- Manchester	T-T
-	- Marion 230	T-T
-	- Mt. Olive 230	T-T
-	- Raeford 230	T-T
-	- Richmond	T-T
-	- Robinson Plant	T-T
-	- Rockingham 230	T-T
-	- Spring Hope SS	T-T
-	- Sumter 230	T-T
-	- Sutton Plant	T-T
-	- Tillery Plant	T-T
-	- Town Creek	T-T
-	- Vander 115	T-T
-	- Wallace	T-T
-	- Weatherspoon Plant	T-T
-	- West End	T-T
-	- Whiteville 230	T-T
-	- Wilmington Corning SS	T-T
-	- Zebulon	T-T

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