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May 19, 2021

VIA ELECTRONIC FILING

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

Re: **Docket No. EMP-114, Sub 0**
Oak Trail Solar, LLC's Cross-Examination and Redirect Exhibits Used In Hearing

Dear Clerk Campbell:

In response to paragraph 3.(6) of the Commission's Order Scheduling Hearings, Requiring Filing of Testimony, Establishing Procedural Guidelines, and Requiring Public Notice, issued on December 14, 2020, attached for filing in the above-referenced docket are Oak Trail Solar, LLC's cross-examination and redirect exhibits used in the May 17, 2021 hearing marked as indicated during the hearing.

Thank you for your assistance. Please contact me if you have any questions.

Sincerely,

/s/ E. Merrick Parrott

Enclosures

cc: Parties of Record

PPAB 6325537v1

Oak Trail Solar, LLC
Cross-Examination Exhibits Used in 5/17/21 Hearing

1. Lawrence Cross-Examination Exhibit #1 -- Duke Energy Progress Generator Interconnection Affected System Study Report for PJM Interconnection Cluster AD2, dated April 5, 2020.
2. Lawrence Cross-Examination Exhibit #2 -- Testimony of Jay B. Lucas Public Staff – North Carolina Utilities Commission in NCUC Docket No. EMP-112, Sub 0, dated March 23, 2021.
3. Lawrence Cross-Examination Exhibit #3 -- Oak Trail Solar, LLC's Prefiled Rebuttal Testimony of Frank Bristol.
4. Lawrence Cross-Examination Exhibit #4 -- Order Issuing Certificate for Merchant Generating Facility for Camden Solar LLC in NCUC Docket Nos. EMP-109, Sub 0 and SP-8831, Sub 0.

Oak Trail Solar, LLC
Redirect Exhibits Used in 5/17/21 Hearing

None.

Generator Interconnection Affected System Study Report

PJM Interconnection Cluster AD2



April 5, 2020
Duke Energy Progress
Transmission Department

PURPOSE

The purpose of this study was to determine under what conditions the DEP transmission system can accommodate PJM's interconnection cluster AD2. Cluster AD2 includes generation throughout the PJM interconnection, but only those with an impact on the DEP system were included in this study. The size and in-service dates of the projects vary. The following PJM queue requests are included in this analysis:

Queue #	MW	Interconnection Substation or Transmission Line
AD2-033	130	Chase City-Lunenburg 115 kV
AD2-046	80	Boydton DP-Kerr Dam 115 kV
AD2-051	74.9	Earleys – Northampton 230kV
AD2-063	150	Central-Chase City 115kV

ASSUMPTIONS

The following affected system study results are from a PJM power-flow model that reflects specific conditions of the system at points in time consistent with the generator interconnection requests being evaluated. The cases include the most recent information for load, generation additions, transmission additions, interchange, and other pertinent data necessary for analysis. Future years may include transmission, generation, and interchange modifications that are not budgeted for and for which no firm commitments have been made. Further, DEP retains the right to make modifications to power-flow cases as needed if additional information is available or if specific scenarios necessitate changes. For the systems surrounding the study area, data is based on the ERAG MMWG model. The suitability of the model for use by others is the sole responsibility of the user. Prior queued generator interconnection requests were considered in this analysis.

The results of this analysis are based on the Interconnection Customer's queue requests including generation equipment data provided. If the facilities' technical data or interconnection points to the transmission system change, the results of this analysis may need to be reevaluated.

RESULTS

Power Flow Analysis Results

Facilities that may require upgrade within the first three to five years following the in-service date are identified. Based on projected load growth on the DEP transmission system, facilities of concern are those with post-contingency loadings of 95% or greater of their thermal rating and low voltage of 0.92 pu and below, for the requested in-service year. The identification of these facilities is crucial due to the construction lead times necessary for certain system upgrades. This process will ensure that appropriate focus is given to these problem areas to investigate whether construction of upgrade projects is achievable to accommodate the requested interconnection service.

Contingency analysis study results show that interconnection of these generation facilities result in the following thermal issue on the DEP system. Based on study results for 2021 summer, Table 1 shows thermal facility loadings:

Table 1: Power Flow Results

Transmission Facility	Loading %	Contingency
Henderson-Kerr Dam (DVP) 115kV line	127.72	DVP_P4-5: T122C breaker failure at Carolina (DVP) 115, lose entire bus
Rocky Mount – Battleboro (DVP) 115kV line	253.72	DVP_P7-1: LN 2058-2181: Rocky Mount-Hathaway (DVP) 230kV East and West lines Common Tower Outage
Greenville – Everetts (DVP) 230kV line	128.41	DVP_P7-1: LN 2058-2181: Rocky Mount-Hathaway (DVP) 230kV East and West lines Common Tower Outage
Rocky Mount – Hathaway (DVP) 230kV lines	148.1	DVP_P7-1: LN 81-2056: Rocky Mount-Hathaway (DVP) 230kV West line and Carolina-Darlington 115kV line

Interconnection requests contributing to the overloaded facilities are shown in Table 2.

Table 2: Upgrades and Contributing Requests

Overloaded Transmission Facility	Contributing Requests	Upgrade Description	Upgrade Cost
Henderson-Kerr Dam (DVP) 115kV line	AD2-033 AD2-046 AD2-063	Reconductor 20.18 miles	\$60 M
Rocky Mount – Battleboro (DVP) 115kV line	AD2-051	Reconductor 8.54 miles	\$24 M
Rocky Mount – Battleboro (DVP) 115kV line	AD2-051	Build new 115kV Phase Shifter Station	\$25 M
Greenville – Everetts (DVP) 230kV line	AD2-051	Reconductor 1.87 miles of one side of double circuit 230kV line plus terminal equipment	\$10 M
Rocky Mount – Hathaway (DVP) 230kV lines	AD2-051	Reconductor 4.73 miles of double circuit 230kV line plus terminal equipment	\$25 M

SUMMARY

This Generator Interconnection Affected System Study assessed the impact on the Duke Energy Progress system of new generation facilities interconnecting to the Dominion transmission system as part of the PJM AD2 cluster. Power flow analysis found overloading issues that must be mitigated. Required upgrades and assigned costs are listed below.

AD2-033 Assigned and Contingent Upgrades	Assigned Cost
Reconductor Henderson-Kerr Dam 115kV line	\$60,000,000
Total for AD2-033	\$60,000,000

AD2-046 Assigned and Contingent Upgrades	Assigned Cost
Reconductor Henderson-Kerr Dam 115kV line	\$0
Total for AD2-046	\$0

AD2-051 Assigned and Contingent Upgrades	Assigned Cost
Reconductor Rocky Mount-Battleboro 115kV line	\$0
Construct Phase Shifter Station in Rocky Mount-Battleboro 115kV line	\$0
Reconductor Greenville-Everetts 230kV line	\$0
Reconductor Rocky Mount-Hathaway 230kV lines	\$0
Total for AD2-051	\$0

AD2-063 Assigned and Contingent Upgrades	Assigned Cost
Reconductor Henderson-Kerr Dam 115kV line	\$0
Total for AD2-063	\$0

Study Completed by: William Quaintance
Bill Quaintance, PE, Duke Energy Progress

Reviewed by: Mark Byrd
Mark Byrd, PE, Duke Energy Progress



**NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION**

March 23, 2021

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

Re: Docket No. EMP-112, Sub 0 - Oak Solar, LLC
CPCN to construct an 120-MW Solar Facility in Northhampton
County, North Carolina.

Dear Ms. Campbell:

In connection with the above-referenced docket, I transmit herewith for filing on behalf of the Public Staff the confidential testimony of Jay B. Lucas, Utilities Engineer, Electric Division.

By copy of this letter, I am forwarding a copy of the public version to all parties of record by electronic delivery. The confidential version will be provided to those parties that have entered into a confidentiality agreement.

Sincerely,

Electronically submitted
s/ Reita D. Coxtan
Staff Attorney
reita.coxton@psncuc.nc.gov

RDC/adb

Attachment

Executive Director
(919) 733-2435

Accounting
(919) 733-4279

Consumer Services
(919) 733-9277

Economic Research
(919) 733-2267

Energy
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Legal
(919) 733-6110

Transportation
(919) 733-7766

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(919) 733-5610

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. EMP-112, SUB 0

In the Matter of)	
Application of Oak Solar, LLC, for a)	TESTIMONY OF
Certificate of Public Convenience and)	JAY B. LUCAS
Necessity to Construct an 120-MW)	PUBLIC STAFF – NORTH
Solar Facility in Northampton County,)	CAROLINA UTILITIES
North Carolina)	COMMISSION

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. EMP-112, SUB 0

Testimony of Jay B. Lucas

On Behalf of the Public Staff

North Carolina Utilities Commission

March 23, 2021

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

3 A. My name is Jay B. Lucas. 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 the manager of 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 make recommendations to the
13 Commission on the application, testimony, and related filings

1 regarding a solar photovoltaic facility in Northampton County, North
2 Carolina that I describe more fully below.

3 **Q. PLEASE PROVIDE A BRIEF HISTORY OF THE APPLICATION.**

4 A. On July 15, 2020, Gaston Green Acres Solar, LLC, (Gaston Green
5 Acres) filed an application for a certificate of public convenience and
6 necessity (CPCN) to construct a 300-megawatt AC (MW_{AC}) solar
7 photovoltaic electric generating facility. The application included the
8 testimony of witness Linda Nwadike.

9 On July 29, 2020, the Public Staff filed a Notice of Completeness for
10 the Gaston Green Acres facility.

11 On September 28, 2020, the Commission issued its *Order*
12 *Scheduling Hearings, Requiring Filing of Testimony, Establishing*
13 *Procedural Guidelines, and Requiring Public Notice* (September 28
14 Order). The September 28 Order required Gaston Green Acres to
15 file supplemental testimony to answer questions from the
16 Commission.

17 On October 19, 2020, Gaston Green Acres filed the supplemental
18 testimony and exhibits of witness Nwadike that answered the
19 Commission's questions. Witness Nwadike explained that the
20 Gaston Green Acres facility will be divided into two facilities. Oak
21 Solar, LLC (Oak Solar), owns the first facility (the Oak Solar facility)

1 with PJM interconnection queue AB1-132 and will have a capacity of
2 120 MW. The second facility is owned by Cherry Solar, LLC, with
3 PJM interconnection queue AC1-086 and will have a capacity of 180
4 MW.

5 On November 13, 2020, Cherry Solar, LLC, filed an application for a
6 CPCN in Docket No. EMP-115, Sub 0, for its 180-MW solar
7 photovoltaic facility. Cherry Solar, LLC, later reduced the capacity to
8 120 MW.

9 On December 18, 2020, the Commission issued its *Order*
10 *Scheduling Hearings, Requiring Filing of Testimony, Establishing*
11 *Procedural Guidelines, and Requiring Public Notice* (December 18
12 Order), which, in part, required Oak Solar to file additional testimony
13 on or before February 25, 2021, and required the Public Staff and
14 other intervenors to file testimony on or before March 25, 2021.

15 On January 25, 2021, the State Clearinghouse filed comments
16 requesting that Gaston Green Acres file additional information. The
17 Department of Natural and Cultural Resources has recommended
18 that a comprehensive archaeological survey of the project area be
19 conducted by an experienced archaeologist.

20 On February 25, 2021, Oak Solar filed the additional testimony and
21 exhibits of witness Nwadike. Her testimony provided answers to the

1 questions in the December 18 Order and provided the System
2 Impact Study, the Facilities Study, and the Feasibility Study for the
3 Oak Solar facility.

4 I. COMPLIANCE WITH THE SEPTEMBER 28 ORDER AND THE
5 DECEMBER 18 ORDER

6 **Q. PLEASE DESCRIBE THE QUESTIONS THAT THE COMMISSION**
7 **INCLUDED IN ITS SEPTEMBER 28 ORDER AND ITS DECEMBER**
8 **18 ORDER.**

9 A. In its September 28 Order, the Commission noted the increase in
10 non-utility generation on the North Carolina system and recognized
11 its statutory duty to examine the long-range needs for the generation
12 of electricity in North Carolina. It directed Gaston Green Acres to file
13 additional testimony and exhibits addressing the following questions
14 regarding its 300-MW solar photovoltaic facility:

- 15 1. Provide the amount of network upgrades on
16 DENC's or any affected system's transmission
17 system, if any, required to accommodate the
18 operation of Gaston Green Acres's proposed
19 facility.
- 20 2. Provide the Levelized Cost of Transmission
21 (LCOT) information for any required
22 transmission system upgrades or modifications.
- 23 3. Provide any interconnection study received for
24 the proposed facility. If Gaston Green Acres has
25 not received a study, provide a date by when the
26 study is expected to be completed.
- 27 4. Are you aware of any system other than the
28 studied system that is or will be affected by the

- 1 interconnection? If yes, explain the impact and
2 basis.
- 3 5. If Gaston Green Acres proposes to sell energy
4 and capacity from the facility to a distribution
5 utility regulated by the Commission, provide a
6 discussion of how the facility's output conforms
7 to or varies from the regulated utility's most
8 recent Integrated Resource Plan (IRP).
- 9 6. If Gaston Green Acres proposes to sell energy
10 and capacity from the facility to a distribution
11 utility not regulated by the Commission but
12 serving retail customers in North Carolina (e.g.,
13 a co-op or muni), provide a discussion of how
14 the facility's output conforms to or varies from
15 the purchasing distribution utility's long-range
16 resource plan.
- 17 7. If Gaston Green Acres proposes to sell energy
18 and capacity from the facility to a purchaser who
19 is subject to a statutory or regulatory mandate
20 with respect to its energy sourcing (e.g., a
21 Renewable Energy Portfolio Standard (REPS)
22 requirement or Virginia's new statutory mandate
23 for renewables), explain how, if at all, the facility
24 will assist or enable compliance with that
25 mandate. Provide any contracts that support
26 that compliance.
- 27 8. Provide any Power Purchase Agreements
28 (PPA), Renewable Energy Certificate (REC)
29 sale contracts, or contracts for compensation for
30 environmental attributes for the output of the
31 facility.

32 In its December 18 Order, the Commission asked the same
33 questions for the Oak Solar facility.

34 **Q. DID WITNESS NWADIKE PROVIDE LCOT CALCULATIONS FOR**
35 **PJM NETWORK UPGRADES IN HER SUPPLEMENTAL**
36 **TESTIMONY?**

37 A. Yes, in her testimony filed on October 19, 2020, witness Nwadike
38 provided LCOT calculations for the Gaston Green Acres facility. Her

1 testimony filed on February 25, 2021, calculated an LCOT for the
2 Oak Solar facility of [BEGIN CONFIDENTIAL] ██████████ [END
3 CONFIDENTIAL] for network upgrades in PJM with an anticipated
4 total cost of [BEGIN CONFIDENTIAL] ██████████ [END
5 CONFIDENTIAL].

6 II. AFFECTED SYSTEM UPGRADES

7 Q. WILL THE OAK SOLAR FACILITY REQUIRE ANY AFFECTED
8 SYSTEM UPGRADES?

9 A. No. Interconnection of PJM cluster AA2 required Duke Energy
10 Progress, LLC (DEP), to upgrade its portion of the Rocky Mount-
11 Battleboro 115 kilovolt transmission line at an estimated cost of
12 \$661,702. This upgrade eliminated any need for affected system
13 upgrades for PJM cluster AB1.

14 Q. WHAT IS THE LATEST SCHEDULE FOR DEP'S AFFECTED
15 SYSTEMS STUDIES FOR OTHER FACILITIES IN PJM
16 TERRITORY?

17 A. On March 5, 2021, DEP provided the Public Staff with its latest
18 schedule for completing affected system studies. This schedule is
19 shown in **Lucas Exhibit 1**.

20 III. CONCLUSIONS AND RECOMMENDATIONS

1 Q. WHAT IS THE PUBLIC STAFF'S RECOMMENDATION ON OAK
2 SOLAR'S APPLICATION FOR A CPCN?

3 A. After reviewing the application, the direct and supplemental
4 testimony of witness Nwadike, and the other evidence in the record
5 and obtained through discovery, the Public Staff recommends that
6 the Commission approve the application and grant the CPCN to Oak
7 Solar for its 120-MW solar photovoltaic facility, subject to the
8 following conditions:

- 9 1. Oak Solar shall construct and operate the Oak Solar facility in
10 strict accordance with applicable laws and regulations,
11 including any local zoning and environmental permitting
12 requirements;
- 13 3. The CPCN shall be subject to Commission Rule
14 R8-63(e) and all orders, rules and regulations as are now or
15 may hereafter be lawfully made by the Commission;
- 16 4. Oak Solar shall file with the Commission in this docket a
17 progress report on the construction of the Oak Solar facility on
18 an annual basis; and
- 19 5. Oak Solar shall file with the Commission in this docket any
20 revisions in the cost estimates for the construction of the Oak

1 Solar facility or any Network Upgrades within 30 days of
2 becoming aware of such revisions.

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

4 A. Yes, it does

QUALIFICATIONS AND EXPERIENCE

JAY B. LUCAS

I graduated from the Virginia Military Institute in 1985, earning a Bachelor of Science Degree in Civil Engineering. Afterwards, I served for four years as an engineer in the Air Force performing many civil and environmental engineering tasks. I left the Air Force in 1989 and attended the Virginia Polytechnic Institute and State University (Virginia Tech), earning a Master of Science degree in Environmental Engineering. After completing my graduate degree, I worked for an engineering consulting firm and worked for the North Carolina Department of Environmental Quality in its water quality programs. Since joining the Public Staff in January 2000, I have worked on utility cost recovery, renewable energy program management, customer complaints, and other aspects of utility regulation. I am a licensed Professional Engineer in North Carolina.

Lucas Exhibit 1

DEP’s schedule for completing affected system studies as of March 5, 2021:

Neighboring Utility	Queue #	MW Capacity	Name and Voltage of Transmission Line	Estimated Study Date
PJM	AD1-023	40	Cashie-Trowbridge 230 kV	3/15/2021
PJM	AD1-057	34	Hornertown-Hathaway 230 kV	3/15/2021
PJM	AD1-076	109	Trowbridge 230 kV	3/15/2021
PJM	AD2-033	130	Chase City-Lunenburg 115 kV	3/15/2021
PJM	AD2-046	80	Boydton DP-Kerr Dam 115 kV	3/15/2021
PJM	AD2-051	74.9	Earleys – Northampton 230kV	3/15/2021
PJM	AD2-063	149.5	Central-Chase City 115kV	3/15/2021
PJM	AE1-026	80	Cashie 230 kV	
PJM	AE1-056	60	Red House-South Creek 115 kV	
PJM	AE1-072	150	Shawboro-Sligo 230 kV	
PJM	AE1-148	90	Kerr Dam-Ridge Rd 115 kV	
PJM	AE2-031	290	Carson-Rawlings 500 kV	
PJM	AE2-033	149	Clubhouse-Sappony 230 kV	
PJM	AE2-034	140	Mackeys 230 kV	
PJM	AE2-044	120	Anaconda-Dunbar 115 kV	
PJM	AE2-051	150	Carson-Septa 500 kV	
PJM	AE2-053	20	Kerr Dam-Ridge Road 115 kV	
PJM	AE2-094	300	Carson-Rogers Road 500 kV	
PJM	AE2-147	150	Swamp 230 kV	
PJM	AE2-258	14.1	Chase City 115 kV substation	
PJM	AE2-259	100	Curdsville-Willis Mtn 115 kV	
PJM	AE2-260	200	Clubhouse 230 kV	

PJM	AE2-291	102 MW Energy / 61.2 MW Capacity	POI coordinates: 37.049923°, -79.118396°	
PJM	AE2-292	127 MW Energy / 76.2 MW Capacity	POI coordinates: 37.049923°, -79.118396°	
PJM	AE2-313	314	Carson-Rawlings 500 Kv	
PJM	AF1-059	99.2	BRODNAX-SOUTH HILL 115 KV	
PJM	AF1- 123/124/125	2640	Fentress Substation 500 kV	
PJM	AF1-236	1210	MACKEYS 230 KV	
PJM	AF1-246	100	Clover Rawlings 500 kV	
PJM	AF1-293	127.86	Kidds Store - Fork Union 115 kV TL	
Santee Cooper	Q83	75	POI coordinates: 33.717511, -79.416569, Hemmingway	
Santee Cooper	Q99	100	Santee Cooper Camden – South Bethune 230 kV Line	



E. Merrick Parrott

Associate

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April 30, 2021

VIA ELECTRONIC FILING

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

Re: **Docket No. EMP-114, Sub 0**

Pre-filed Rebuttal Testimony of Frank Bristol in Support of Oak Trail Solar, LLC's Application for a Certificate of Public Convenience and Necessity for a Merchant Plant

Dear Clerk Campbell:

Enclosed for filing is the pre-filed rebuttal testimony of Frank Bristol incorporating and supporting Oak Trail Solar, LLC's Application for a Certificate of Public Convenience and Necessity for a Merchant Plant and Rebuttal Exhibits A, B, and C in the above-referenced docket.

Thank you for your assistance. Please contact me if you have any questions.

Sincerely,

/s/ E. Merrick Parrott

Enclosures

cc: Parties of Record

PPAB 6284358v1.doc

49 **Q. ARE THE PJM NETWORK UPGRADES FOR THE OAK TRAIL**
50 **FACILITY KNOWN?**

51 A. Yes. The System Impact and Facilities Studies for AD2-160 and
52 AE2-253¹ identified no network upgrades other than those related to building and
53 integrating the new Point of Interconnection (“POI”) substation and no Affected
54 System Upgrades on the DEP System.

55 **Q. ARE THE FINAL PJM NETWORK UPGRADE COSTS**
56 **IDENTIFIED FOR THE FACILITY?**

57 A. Yes. Oak Trail is a party to the fully executed Interconnection
58 Service Agreement (“ISA”) among PJM Interconnection, LLC (“PJM”), Oak Trail,
59 and Virginia Electric and Power Company (“Dominion”) dated March 3, 2021.²
60 **Bristol Rebuttal Exhibit A.** As shown in the ISA, Oak Trail is responsible for
61 \$10,002,252 in interconnection costs, comprised of Attachment Facilities, Direct
62 Connection Network Upgrades and Non-Direct Connection Network Upgrades
63 (“PJM Interconnection Costs”). All of these charges are related to building and
64 integrating the POI substation and will be borne by the Oak Trail, not ratepayers.

65 **Q. ARE THE PJM INTERCONNECTION COSTS IDENTIFIED IN THE**
66 **ISA SUBJECT TO MODIFICATION?**

67 A. No. These are the final PJM Interconnection costs for the Facility
68 as outlined in the ISA.

¹ Oak Trail provided the System Impact Studies for both its AD2 and AE2 queue positions on September 17, 2020 as ***Confidential*** Application Addenda 5 and 6, and provided the Facilities Study Report on February 22, 2021 as ***Confidential*** Supplemental Application Addendum 1.

² This FERC-jurisdictional ISA was filed with FERC in docket ER21-1578-000 on April 1, 2021. The deadline for comments and interventions was April 22, 2021, and there were no comments or interventions in the docket.

69 **Q. IF GENERATORS FROM PREVIOUS PJM CLUSTERS DO NOT**
70 **COME TO FRUITION, CAN THOSE PLANNED UPGRADES BE PUSHED TO**
71 **OAK TRAIL?**

72 A. No. If any of the planned upgrades assigned to earlier queued
73 generators in the PJM queue were considered contingent to Oak Trail, they
74 would have been identified as a contingent upgrade in Section 3(d) of the ISA.
75 No such contingent upgrades related to earlier queued projects were identified in
76 the ISA.

77 **Q. WILL THE PJM INTERCONNECTION COSTS BE SUBJECT TO**
78 **REIMBURSEMENT?**

79 A. No. Per the ISA, Oak Trail is responsible for the PJM
80 Interconnection Costs and per PJM's Open Access Transmission Tariff
81 ("OATT")³, the PJM Interconnection Costs identified in the Oak Trail ISA are not
82 subject to reimbursement. As previously stated on page 3 of the prefiled
83 supplemental testimony of Matt Crook filed on February 22, 2021 in this docket,
84 the "entire cost of the network upgrades will be borne by [Oak Trail] and not
85 reimbursed."

86 **Q. DOES THE ISA ALTER THE FACILITY'S LCOT PREVIOUSLY**
87 **IDENTIFIED IN THIS DOCKET?**

88 A. No. The PJM Interconnection Costs identified in the ISA are
89 identical to the costs identified in the Facilities Study Report provided as
90 ***Confidential*** Supplemental Application Addendum 1 on February 22, 2021. As
91 such, the Facility's LCOT of \$1.94 described in previous docket filings has

92 remained consistent throughout Oak Trail's CPCN application filings. Public Staff
93 stated that it did not disagree with the LCOT calculation "but, because of the
94 tentative nature of projects in the queue, costs can be shifted from one cluster to
95 another." However, as discussed above, the parties have executed the ISA and
96 therefore these costs are final and not subject to modification, so the LCOT will
97 not change for the Facility.

98 **DEP Affected Systems Costs**

99 **Q. DO YOU AGREE WITH PUBLIC STAFF'S STATEMENTS THAT**
100 **OAK TRAIL'S AFFECTED SYSTEMS COSTS ARE SUBJECT TO CHANGE?**

101 A. No. Public Staff witness Lawrence states the following in his
102 testimony:

103 The Applicant is not aware of any impacts to affected
104 systems at this time. The completed interconnection studies
105 also do not reflect the need for affected system studies or
106 upgrades. However, Duke Energy Progress, LLC (DEP),
107 has recently completed an affected system study for the AC1
108 PJM interconnection cluster. The Facility is part of PJM's
109 AD2 and AE2 interconnection clusters. If any network
110 upgrades for four to six other clusters (AB2, AC1, AC2, AD1,
111 AD2, and AE1) are necessary or need alteration, they may
112 need to be completed before the Facility can begin full
113 operation. If generator projects from these previous clusters
114 do not come to fruition, the planned upgrades could be
115 pushed to later clusters. If projects from these previous
116 clusters do come to fruition, additional upgrades may be
117 needed for AD2 and AE2 that cannot be studied until there is
118 more certainty regarding the size and placement of the
119 interconnected generators.

120 Public Staff witness Lawrence states that Oak Trail was not aware of any
121 impacts to affected systems "at this time," but this is not accurate. Oak Trail is
122 aware of impacts to affected systems assigned to the Facility, and it has been

³ The PJM OATT can be found here: <https://agreements.pjm.com/oatt/3897>

123 determined that there are no, i.e. \$0, affected systems impacts assigned to the
124 Facility.

125 As part of the CPCN application filed on September 17, 2020, Oak Trail
126 provided the PJM System Impact Studies for both its AD2 and AE2 queue
127 positions as *Confidential* Application Addenda 5 and 6. Both studies included a
128 section related to affected systems, and both reported that no impacts to DEP
129 were identified.⁴

130 In addition, Affected Systems Costs, if any, would be identified in the ISA,
131 but there are none for Oak Trail.⁵

132 **Q. ARE ANY OF THE DEP AFFECTED SYSTEMS STUDIES**
133 **AVAILABLE FOR THE PJM CLUSTERS LISTED BY PUBLIC STAFF**
134 **WITNESS LAWRENCE?**

⁴ As a contrast, in the June, 2019 PJM System Impact Study for AD2-033 (which is a queue position identified in DEP’s AD2 affected system study), the Affected Systems section states: “Enter into an Affected System Facilities Study agreement with Duke / Progress Energy (DEP) to determine how to mitigate the Line #45 GW King Tap – Kerr Dam 115 kV overload. The upgrade will likely be a complete reconductor, probably replacing some structures. The estimated cost is \$40 million and is anticipated to require 48 months to complete.” If affected systems impacts for Oak Trail had been identified, similar language would have appeared in Oak Trail’s System Impact Studies. The AD2-033 SIS can be found here: ftp://ftp.pjm.com/planning/project-queues/impact_studies/ae2033_imp.pdf

⁵ As a contrast, in the April 2, 2020 Interconnection Service Agreement among PJM, Alton Post Office Solar, LLC (“Alton”), and Dominion filed in FERC docket no. ER20-2348-000, Schedule F identifies “Required Affected System Upgrades and states: “In order to maintain system reliability, the Customer Facility under this ISA cannot come in service prior to the completion of the Duke Energy Progress upgrade system protection at the Person substation to accommodate the new AC1-221 substation. The work at Person substation is not part of the scope of the Facility Study for this AC1-221/AD1-058 Interconnection Request and the costs for that work are not represented in this Agreement. This work will occur under a separate agreement between Duke Energy Progress and the Interconnection Customer.” The Alton ISA can be found here: https://elibrary.ferc.gov/eLibrary/filelist?document_id=14875643&accessionnumber=20200708-5123

135 A. Yes. On the DEP OASIS website, Generator Interconnection
136 Affected System Study Reports for the following PJM clusters have been
137 published: (1) AB2, dated December 22, 2016; (2) AC1, dated May 6, 2020; (3)
138 AD1, dated April 5, 2021; and (4) AD2, dated April 5, 2021.⁶

139 **Q. IS OAK TRAIL PART OF ANY OF THESE PJM CLUSTERS?**

140 A. Yes. As referenced by Public Staff witness Lawrence, Oak Trail is
141 part of PJM's AD2 and AE2 interconnection clusters. As such, if Oak Trail's AD2
142 queue position caused any affected systems impact on DEP's system, the April
143 5, 2021 DEP Generator Interconnection Affected System Study Report for PJM
144 Interconnection Cluster AD2 ("AD2 DEP Affected System Study Report") would
145 identify Oak Trail in the report. The AD2 DEP Affected System Study Report is
146 provided as **Bristol Rebuttal Exhibit B**.

147 **Q. DOES THE AD2 DEP AFFECTED SYSTEM STUDY REPORT**
148 **IDENTIFY OAK TRAIL AS HAVING AN IMPACT ON DEP'S SYSTEM?**

149 A. No. The AD2 DEP Affected System Study Report states: "Cluster
150 AD2 includes generation throughout the PJM interconnection, but only those with
151 an impact on the DEP system were included in this study." The only four AD2
152 queue positions identified were AD2-033, AD2-046, AD2-051, and AD2-063⁷.
153 Oak Trail's queue position (AD2-160) was not included in the study, confirming
154 that it does not have an impact on the DEP system.

⁶ Oak Trail notes that the front page of the AD2 report references April 5, 2020, but the footers of the rest of the report reference April 5, 2021. According to the OASIS website timestamp, the report was uploaded on April 20, 2021, the same date that the April 5, 2021 AD1 report was uploaded. As such, Oak Trail believes the 2020 date on the first page is a clerical error and that the report is dated April 5, 2021.

⁷ Unlike Oak Trail, none of these four AD2 queue positions have progressed in the PJM study process past the System Impact Study phase, despite having a higher queue priority.

155 **Q. HAS DEP PUBLISHED A GENERATOR INTERCONNECTION**
156 **AFFECTED SYSTEM STUDY REPORT FOR THE AE2 PJM CLUSTER?**

157 A. DEP’s affected system study report for the AE2 PJM cluster has not
158 yet been published on DEP’s OASIS website, but PJM’s Oak Trail System
159 Impact Studies indicate that there are no Affected System Upgrades assigned to
160 Oak Trail and Oak Trail’s fully executed ISA has no Affected System Upgrades.

161 **Q. DOES THE PJM OATT ADDRESS REQUIRED COORDINATION**
162 **BETWEEN PJM AND AFFECTED SYSTEMS?**

163 A. Yes. PJM’s OATT requires PJM to coordinate with any identified
164 affected systems operators during the study phase and include the results, if
165 available, in the system impact study or the facilities study. PJM OATT § 202.
166 On April 28, 2021, PJM confirmed that “DEP reviewed the two queue positions
167 for [Oak Trail] during the study process and determined there were no impacts to
168 their system. No further DEP study is required.” **Bristol Rebuttal Exhibit C.** In
169 addition, as discussed above, no affected systems were identified in any of Oak
170 Trail’s interconnection studies and Oak Trail has a fully executed ISA with no
171 Affected System Upgrades identified.

172 **Q. ARE YOU FAMILIAR WITH THE NCUC DOCKET E-100, SUB 170**
173 **PROCEEDING THAT PUBLIC STAFF WITNESS LAWRENCE REFERENCED**
174 **IN HIS TESTIMONY?**

175 A. I am generally familiar with the E-100 Sub 170 docket (“Sub 170
176 Docket”).

177 **Q. IS THERE INFORMATION IN THE SUB 170 DOCKET THAT**
178 **SUPPORTS THAT OAK TRAIL DOES NOT IMPACT DEP’S TRANSMISSION**
179 **SYSTEM OR DEP’S CUSTOMERS?**

180 A. Yes. On page 3 of DEP’s comments regarding the affected system
181 study process and cost allocation filed in the Sub 170 Docket on October 7,
182 2020, DEP stated that:

183 Historically, interconnection customers that were assigned
184 affected system network upgrades in DEP/DEC/DEF were
185 reimbursed after the applicable projects achieved
186 commercial operation pursuant to the terms of the affected
187 system operating agreement. However, DEP and DEC
188 (along with Duke Energy Florida, LLC) implemented a
189 change to its standard affected system operating agreement
190 effective October 1, 2020 that eliminated the reimbursement.

191 On page 8 of Public Staff witness Lawrence’s testimony, Mr. Lawrence
192 references this reimbursement elimination and states “The Public Staff agrees
193 with this change. . . . In short, if there are no cost impacts to the customers of
194 electric public utilities, the Public Staff takes no issue with the application.” As
195 detailed above, there are no affected systems costs assigned to Oak Trail. As
196 the advocate for the using and consuming public, DEP’s reimbursement
197 elimination should be sufficient to alleviate Public Staff’s concern that there would
198 be cost impacts to customers such that the Public Staff should “take no issue
199 with the application.”

200 In addition, the location of the Facility explains why there are no affected
201 system impacts to DEP’s transmission system. On page 3 of DEP’s reply
202 comments filed in the Sub 170 Docket on December 16, 2020, DEP states:

203 Finally, it is important to note that the affected system study
204 process [. . .] only impacts a relatively small slice of

205 interconnection customers that are seeking to interconnect
206 near the “seam” between the transmission assets of two
207 separate transmission owners. Thus, for instance, as it
208 relates to Scenario #2—“Other Transmission Owner as the
209 Affected System,” very few of the thousands of
210 interconnection customers that have sought or are seeking
211 interconnection to Duke’s system are impacted by affected
212 system issues.

213 The Facility is located in Currituck County, which is the furthest northeast
214 county in North Carolina. As such, the Facility is a great distance away from
215 DEP’s system and, thus, nowhere near the “seam” between the transmission
216 assets of two separate transmission owners.

217 **Proposed Alternate Conditions on the CPCN**

218 **Q. DOES OAK TRAIL HAVE CONCERNS ABOUT THE**
219 **RECOMMENDED CONDITIONS LISTED IN PUBLIC STAFF WITNESS**
220 **LAWRENCE’S TESTIMONY?**

221 A. Yes. Oak Trail is a late-stage project with a fully executed ISA and
222 a fully executed PPA⁸, and it has various upcoming contractual deadlines it must
223 meet. As outlined above, the interconnection costs, including network upgrade
224 and affected systems costs, have been studied and are final. Oak Trail is
225 concerned that Public Staff’s recommended conditions are not narrowly tailored
226 to Oak Trail because they suggest that these costs are not final. As a result, the
227 recommended conditions could cause confusion and delay the ability of Oak Trail
228 to obtain financing partners. Such delays would cause significant financial
229 impacts to Oak Trail.

⁸ Oak Trail provided the fully executed PPA on February 22, 2021 as *Confidential* Supplemental Application Addendum 3.

230 **Q. ARE THERE DIFFERENT CONDITIONS THAT OAK TRAIL**
231 **WOULD CONSENT TO THE COMMISSION ATTACHING TO THE CPCN?**

232 A. Yes. Oak Trail is in a substantially similar position to the position
233 Camden Solar LLC (“Camden”) was in when the Commission issued Camden’s
234 CPCN on September 14, 2020 in docket EMP-109 Sub 0.⁹ Oak Trail believes
235 the conditions placed on the Camden CPCN are more appropriate given the
236 factual similarities between the projects and would consent to the four conditions
237 attached to Camden CPCN. For convenience, Oak Trail’s proposed conditions
238 to its CPCN are as follows:

239 (a) Oak Trail Solar, LLC will construct and operate the
240 Facility in strict accordance with applicable laws and
241 regulations, including any local zoning and environmental
242 permitting requirements;

243 (b) Oak Trail Solar, LLC will not assert that the issuance
244 of the certificate in any way constitutes authority to exercise
245 any power of eminent domain, and it will abstain from
246 attempting to exercise such power;

247 (c) Oak Trail Solar, LLC will comply with all orders, rules,
248 regulations and conditions as are now or may hereafter be
249 lawfully made by the Commission; and

250 (d) Oak Trail Solar, LLC shall file with the Commission in
251 this docket any revisions in the cost estimates for the

⁹ For example, Camden also had a fully executed ISA, a fully executed Renewable Energy Purchase Agreement, and did not have any affected systems costs assigned to its facility.

252 interconnection facilities, network upgrades (including
253 network upgrades on affected systems), or any other
254 significant change in costs within 30 days of becoming
255 aware of such revisions.^{10 11}

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

257 **A. Yes.**

¹⁰ Oak Trail notes that condition (d) has been revised from the Camden precedent to remove the obligation to file revisions in the cost estimates for the “construction of the Facility.” This language is broad and could be read to require Oak Trail to notify the Commission any time construction costs change at all, and construction costs for any development change frequently. In addition, Rule R8-63(f) requires merchant plant applicants to “submit annual progress reports and any revisions in cost estimates, as required by G.S. 62-110.1(f) until construction is completed.” As such, that rule already obligates Oak Trail to file annual updates to cost estimates for the construction of the Facility and more frequent updates are unnecessarily burdensome. In addition, in settlement discussions between Oak Trail and the Public Staff, the Public Staff agreed to removal of “construction of the Facility” from the similar recommended condition in Public Staff witness Lawrence’s testimony.

¹¹ As stated throughout this testimony, the interconnection and affected system costs for Oak Trail are final. However, in an effort to bridge the gap with the Public Staff’s recommended conditions, Oak Trail consents to this condition which is substantially similar to recommended condition (iii) listed in Public Staff witness Lawrence’s testimony.

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. EMP-109, SUB 0
DOCKET NO. SP-8831, SUB 0

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of		
Application of Camden Solar LLC)	ORDER ISSUING
for a Certificate of Public Convenience and)	CERTIFICATE FOR MERCHANT
Necessity to Construct a 20-MW Solar)	GENERATING FACILITY
Facility in Camden County, North Carolina)	

BY THE COMMISSION: On August 1, 2017, in Docket No. SP-8831, Sub 0, the Commission issued Camden Solar LLC (Applicant or Camden Solar) a certificate of public convenience and necessity (CPCN) pursuant to N.C. Gen. Stat. § 62-110.1(a) and Commission Rule R8-64 for the construction of a 20-MW_{AC} solar photovoltaic (PV) electric generating facility to be located in Camden County, North Carolina (the Facility). Contemporaneously with its application in that docket the Applicant filed a registration statement for a new renewable energy facility; however, the Applicant withdrew its registration statement for the Facility on July 17, 2017.

On April 1, 2020, the Applicant filed an new application pursuant to N.C.G.S. § 62-110.1(a) and Commission Rule R8-63 for a CPCN to construct the Facility as a merchant generating facility and to cancel the CPCN previously granted for the Facility in Docket No. SP-8831, Sub 0. The Applicant stated that the site plan had not changed materially from the plan previously approved and requested that the Commission require no further State Clearinghouse review.

On April 15, 2020, the Public Staff filed a Notice of Completeness stating that it had reviewed the application as required by Commission Rule R8-63(d) and that it considered the application to be complete. In addition, the Public Staff requested that the Commission issue a procedural order setting the application for hearing, requiring public notice pursuant to N.C.G.S. § 62-82, and addressing other procedural matters.

On April 24, 2020, the Commission issued an Order Requiring Filing of Testimony, Establishing Procedural Guidelines, and Requiring Public Notice (Scheduling Order). The Scheduling Order, among other things, scheduled hearings on June 22, 2020, in North Camden, North Carolina, for the purposed of receiving public witness testimony and on July 6, 2020, in Raleigh, North Carolina, for the purpose of receiving expert witness testimony regarding the application.

On May 15, 2020, the Public Staff filed testimony recommending that the Commission cancel the CPCN issued in Docket No. SP-8831, Sub 0 and issue a new CPCN, subject to certain conditions.

On June 2, 2020, the Applicant filed a Motion to Cancel Hearings requesting that the Commission cancel the public witness hearing scheduled for June 22, 2020, and the expert witness hearing scheduled for July 6, 2020. The Applicant stated that the Public Staff consented to the cancellation of the hearings.

On June 8, 2020, the Commission canceled the hearing scheduled for the purpose of receiving public witness testimony.

On June 15, 2020, Camden Solar filed a Motion for Limited Construction Authority to construct perimeter fencing, erosion control measures, pile installation, equipment pads, and underground wiring.

On June 22, 2020, the Commission issued an Order Cancelling Expert Witness Hearing and Requiring Additional Testimony.

On June 23, 2020, the Commission issued an Order Allowing Limited Construction with Conditions that granted Camden Solar the authority to engage in construction of perimeter fencing, erosion control measures, pile installation, equipment pads, and underground wiring provided that Camden Solar would bear all costs and other risks of the limited construction activities.

On July 15, 2020, Camden Solar filed the testimony of Whitney Rubin in response to the order of June 22, 2020, requiring additional information.

On July 29, 2020, the Public Staff filed the supplemental testimony of Jay Lucas. In his July 29, 2020 testimony Public Staff witness Lucas recommends that the Commission grant the requested CPCN, subject to certain conditions.

On August 24, 2020, Camden Solar filed a Renewable Energy Purchase Agreement as required by the order of June 22, 2020, requiring additional information.

After careful consideration the Commission finds good cause to approve the application and issue the requested CPCN for the Facility as a merchant generating facility, subject to the conditions recommended by the Public Staff. In reaching this determination the Commission finds that the uncontested evidence demonstrates that there is a need for the Facility in the region, in accord with the provisions of Commission Rule R8-63(b)(3). Supporting this finding is the Applicant's verified application and the testimony of Applicant's witness Rubin which projects that the corporate purchases of energy and renewable energy credits (RECs) from solar facilities in the southeast region of PJM Interconnection, L.L.C. (PJM), are expected to increase. Witness Rubin further notes Dominion Energy North Carolina's (DENC) commitment to increase its use of renewable energy resources to generate 5,000 MW of electricity by 2028, consistent with

Virginia's policy goals enacted in the Virginia Grid Transformation and Security Act of 2019. At the time of its CPCN application as a merchant generating facility, Camden Solar anticipated entering into a contract for the sale of the energy produced by the Facility, and on August 24, 2020, the Applicant filed a Renewable Energy Purchase Agreement evincing the sale of the output of the Facility to a corporate offtaker in PJM.

The Commission has also reviewed this application in light of its mandate under N.C.G.S. § 62-110.1(c) to analyze and plan for the long-range need for generating resources in North Carolina and to evaluate CPCN applications for new generating facilities in North Carolina in light of such analysis and plan. Based upon the evidence of record the Commission finds that due to the Applicant's plans for the sale of energy and capacity from the Facility to a customer in the PJM market, it does not appear that the Facility will have any material impact on the long-range balance of demand for electricity and the generation resources available to meet that demand in North Carolina. In addition, the Commission notes that based on the evidence of record, the Facility will not affect the projections of load or the identification of needed generating resources set forth in the integrated resource plans for any public utility subject to the Commission's jurisdiction.

Finally, based on the testimony of Applicant witness Rubin and Public Staff witness Lucas, the Commission finds that the Facility is not expected to have any impact on the DENC transmission system or the transmission system of any affected system. Applicant witness Rubin testified that the project would only require distribution system upgrades and would not require any transmission upgrades or modifications. Public Staff witness Lucas noted that although an Affected System Study Report conducted by Duke Energy Progress, LLC (DEP), in 2016 showed Camden Solar was part of a PJM cluster that would cause network upgrades on the DEP system, a 2020 DEP Affected System Study Report shows that those network upgrade costs are now attributed to a different PJM cluster of facilities.

In summary the Commission finds and concludes that the public convenience and necessity requires construction of the Facility pursuant to N.C.G.S. § 62-110.1. The Commission concludes that due to the siting of the Facility, construction of the Facility is consistent with an orderly expansion of electricity generating capacity in the region and presents no risk of service degradation; of any financial impact on North Carolina's electricity generation, transmission and distribution infrastructure; or of overbuilding of generation facilities in this region of North Carolina.

IT IS, THEREFORE, ORDERED as follows:

1. That a certificate of public convenience and necessity shall be, and is hereby, issued to Camden Solar LLC for the construction of a 20-MW_{AC} solar PV electric

generating facility to be located in Camden County, North Carolina, and to be operated as a merchant generating facility. This certificate is subject to the following conditions:

(a) Camden Solar LLC will construct and operate the Facility in strict accordance with applicable laws and regulations, including any local zoning and environmental permitting requirements;

(b) Camden Solar LLC will not assert that the issuance of the certificate in any way constitutes authority to exercise any power of eminent domain, and it will abstain from attempting to exercise such power;

(c) Camden Solar LLC will comply with all orders, rules, regulations and conditions as are now or may hereafter be lawfully made by the Commission; and

(d) Camden Solar LLC shall file with the Commission in this docket any revisions in the cost estimates for the construction of the Facility, interconnection facilities, network upgrades (including network upgrades on affected systems), or any other significant change in costs within 30 days of becoming aware of such revisions.

2. That Camden Solar LLC shall file with the Commission in this docket a progress report and any revisions in the cost estimates for the Facility on an annual basis,

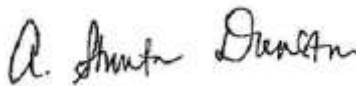
3. That Appendix A hereto shall constitute the certificate of public convenience and necessity issued for the Facility; and

4. That the CPCN issued to Camden Solar LLC by order dated August 1, 2017, in Docket No. SP-8831, Sub 0 shall be, and is hereby, canceled.

ISSUED BY ORDER OF THE COMMISSION.

This the 14th day of September, 2020.

NORTH CAROLINA UTILITIES COMMISSION



A. Shonta Dunston, Deputy Clerk

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. EMP-109, SUB 0

Camden County Solar LLC
17901 Von Karman Avenue, Suite 1050
Irvine, California 92614

is hereby issued this

**CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY
PURSUANT TO N.C. GEN. STAT. § 62-110.1**

for a 20-MW_{AC} solar photovoltaic electric generating facility

located

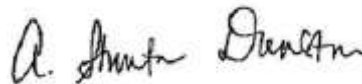
on two parcels of land for a total of 218 acres located at the southwest corner of the intersection of N.C. Highway 343 and Sand Hills Road (Route 1132), Camden in Camden County, North Carolina,

subject to all orders, rules, regulations and conditions
as are now or may hereafter be lawfully made
by the North Carolina Utilities Commission.

ISSUED BY ORDER OF THE COMMISSION.

This the 14th day of September, 2020.

NORTH CAROLINA UTILITIES COMMISSION



A. Shonta Dunston, Deputy Clerk