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October 20, 2021

Via Electronic Filing
Ms. A. Shonta Dunston
Chief Clerk
North Carolina Utilities Commission
430 N. Salisbury Street
Raleigh, NC 27603

**Re: Macadamia Solar, LLC
Consolidated Docket Nos. EMP-119, Subs 0 and 1
Supplemental Pre-Filed Direct Testimony of Donna Robichaud**

Dear Ms. Dunston:

Provided herewith for filing in the above referenced consolidated dockets is the Supplemental Pre-Filed Direct Testimony of Donna Robichaud.

If you should have any questions concerning this filing, please let me know. Thank you for your assistance with this filing.

Very truly yours,

A handwritten signature in blue ink that reads 'Benjamin L. Snowden'.

Benjamin L. Snowden

Enclosure

pbb

A Pennsylvania Limited Liability Partnership

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Fox Rothschild LLP
ATTORNEYS AT LAW

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cc: Parties of Record
Zeke Creech, Public Staff
Reita Coxton, Public Staff
Heather Fennell, Commission Legal Staff
Erin Duffy, Commission Legal Staff

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Oct 20 2021

SUPPLEMENTAL PRE-FILED DIRECT TESTIMONY OF
DONNA ROBICHAUD
ON BEHALF OF MACADAMIA SOLAR LLC
NCUC DOCKET NO. EMP-119, SUB 0
NCUC DOCKET NO. EMP-119, SUB 1

INTRODUCTION

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is Donna Robichaud. I am senior vice president of development strategy for Geenex Solar LLC (“Geenex Solar”) based in Charlotte, North Carolina. The company’s address is 1930 Abbott Street, Suite 402, Charlotte, NC 28203.

Q. ARE YOU THE SAME DONNA ROBICHAUD THAT PROVIDED TESTIMONY IN THESE CONSOLIDATED DOCKETS ON AUGUST 30, 2021 AND SEPTEMBER 13, 2021?

A. I am.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The primary purpose of my testimony is to provide information required by the Commission in its September 24, 2021, *Order Consolidating Dockets, Scheduling Hearings, Requiring Filing of Testimony, Establishing Procedural Guidelines, and Requiring Public Notice*, which required the filing of additional testimony and exhibits addressing a number of specific questions. The other purpose of my testimony is to inform the Commission of the completion of a revised Affected System Study for Cluster AD1 by Duke Energy Progress LLC (“DEP”) on September 9, 2021 (“Affected System Study”); and to provide context and explanation for that study.

The questions on which the Commission directed the filing of supplemental testimony and exhibits are set forth below. As discussed below, each of those questions

was addressed in my Direct Testimony, prefiled with the Commission in support of the Application for a Certificate of Public Convenience and Necessity for the Macadamia Project on August 31, 2021 (“CPCN Direct Testimony”). However, because of DEP’s completion of another Affected System Study in September 2021, I have supplemented certain responses below.

Q. ARE THERE ANY NETWORK UPGRADES TO DENC’S, AEP’S OR ANY AFFECTED SYSTEM’S TRANSMISSION SYSTEM REQUIRED TO ACCOMMODATE THE OPERATION OF THE APPLICANT’S PROPOSED FACILITY?

A. Yes. This topic is discussed on pages 6 - 12 of my CPCN Direct Testimony. However, the September 2021 Affected System Study (included as Attachment A) has narrowed the scope of likely upgrades to DEP’s system that may be required to interconnect the Macadamia Project.

As I anticipated in my CPCN Direct Testimony, the September 2021 Affected System Study confirms that a \$25 M cost allocation for the Rocky Mt. – Hathaway 230 kV upgrade is not required for Macadamia Project, and DEP has removed the cost allocation. DEP is expected to produce another revision of the Affected System Study this fall, after PJM completes a retool of the System Impact Study for the AD1 cluster. While Applicant does not expect any cost allocation changes, there is a possibility that the \$10 M upgrade of the Everetts – Greenville 230 kV line, currently assigned to queue no. AD1-023, could be assigned to the Macadamia Project instead.

Q. IF THERE ARE ANY REQUIRED SYSTEM UPGRADES, DOES THE APPLICANT HAVE LEVELIZED COST OF TRANSMISSION (LCOT) INFORMATION FOR THE SYSTEM UPGRADES?

A. Yes. This topic is discussed on pages 13 - 16 of my CPCN Direct Testimony. Given the results in the September 2021 Affected System Study, DEP Scenario 2 and 3 are now eliminated from Table 2 on page 14, since they included the \$25 M cost allocation for the Rocky Mt. – Hathaway 230 kV upgrade that is no longer assigned to Macadamia. As detailed in DEP Scenario 1 in Table 2, if the \$10 M cost of the Everetts – Greenville 230 kV upgrade were assigned to Macadamia and to two other projects in the AD1 cluster, the LCOT of this upgrade would be \$0.26/MWh. If the upgrade were solely assigned to Macadamia, the LCOT would be \$0.38/MWh.

Q. IS THERE ANY INTERCONNECTION STUDY AVAILABLE FOR THE PROPOSED FACILITY?

A. Yes. This topic is discussed on pages 5 - 6 of my CPCN Direct Testimony and in Attachments A - C of my testimony. As discussed above, DEP also produced an Affected System Study in September 2021 (Attachment A).

Q. IS THE APPLICANT AWARE OF ANY SYSTEM OTHER THAN THE STUDIED SYSTEM THAT IS OR WILL BE AFFECTED BY THE INTERCONNECTION?

A. Yes. This topic is discussed on pages 9 - 12 of my CPCN Direct Testimony and is further discussed above.

Q. IS THE APPLICANT PROPOSING TO SELL ENERGY AND CAPACITY FROM THE FACILITY TO A DISTRIBUTION FACILITY REGULATED BY THE COMMISSION?

A. No. This topic is discussed on page 18 of my CPCN Direct Testimony.

Q. IS THE APPLICANT PROPOSING TO SELL ENERGY AND CAPACITY FROM THE PROPOSED FACILITY TO A PURCHASER WHO IS SUBJECT TO A STATUTORY OR REGULATORY MANDATE WITH RESPECT TO ITS ENERGY SOURCING (E.G., A REPS REQUIREMENT OR VIRGINIA'S NEW STATUTORY MANDATE FOR RENEWABLES)?

A. No. This topic is discussed on page 18 of my CPCN Direct Testimony.

Q. DOES THE APPLICANT HAVE A POWER PURCHASE AGREEMENT (PPA), REC SALE CONTRACTS OR CONTRACTS FOR COMPENSATION FOR ENVIRONMENTAL ATTRIBUTES FOR THE OUTPUT OF THE PROPOSED FACILITY?

A. Not at this time. This topic is discussed on page 18 of my CPCN Direct Testimony.

Q. ARE THERE ANY OTHER ASPECTS OF YOUR PREFILED TESTIMONY THAT YOU WISH TO UPDATE?

A. Yes. On pages 11 and 12 of my CPCN Direct Testimony, I discuss a pending FERC proceeding relating to an Affected System Operating Agreement ("ASOA") between American Beech Solar and DEP. On October 1, 2021, FERC issued an order rejecting the American Beech ASOA because DEP had failed to justify the removal of the

reimbursement provision from the ASOA.¹ Applicant anticipates that if DEP resumes providing reimbursement for upgrades in future Affected System Operating Agreements a result of FERC's order, the Applicant would seek reimbursement of any Affected System Upgrade costs assigned to the Project.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

¹ FERC Docket No. ER21-1955-002. "Order Rejecting Affected system Operator Agreements dated October 1, 2021" p. 13 – 15.

**ATTACHMENT A
TO SUPPLEMENTAL PRE-FILED DIRECT TESTIMONY OF D. ROBICHAUD
CONSOLIDATED DOCKETS EMP-119, SUBS 0 AND 1**

**DUKE ENERGY PROGRESS, LLC
GENERATOR INTERCONNECTION
AFFECTED SYSTEM STUDY
(SEPTEMBER 9, 2021)**

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Oct 20 2021

Generator Interconnection Affected System Study Report

PJM Interconnection Cluster AD1

Revision 1



September 9, 2021
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 AD1. Cluster AD1 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
AD1-022/023	120	Cashie-Trowbridge 230 kV
AD1-056/057	94	Hornertown-Hathaway 230 kV
AD1-074/075/076	484	Trowbridge 230 kV

This Revision 1 removes the upgrade of the Rocky Mount – Hathaway 230kV lines, based on information from PJM impact study reports.

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 issues on the DEP system. Based on study results for 2021 summer, Table 1 shows thermal facility loadings:

Table 1: Power Flow Results

Overloaded Transmission Facility	Loading %	Contingency
Rocky Mount – Battleboro (DVP) 115kV line	235.0	DVP_P7-1: LN 2058-2181: Rocky Mount-Hathaway (DVP) 230kV East and West lines Common Tower Outage
Greenville – Everetts (DVP) 230kV line	124.08	DVP_P7-1: LN 2058-2181: Rocky Mount-Hathaway (DVP) 230kV East and West lines Common Tower Outage

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	Time to Complete
Rocky Mount – Battleboro (DVP) 115kV line	AD1-022/023 AD1-056/057	Reconductor 8.54 miles	\$31.3 M	30 months
Rocky Mount – Battleboro (DVP) 115kV line	AD1-022/023 AD1-056/057	Build new 115kV Phase Shifter Station	\$25 M*	36 months*
Rocky Mount – Battleboro (DVP) 115kV line	AD1-022/023 AD1-056/057	PJM potential project to reconfigure 115kV lines	-	-
Greenville – Everetts (DVP) 230kV line	AD1-022/023 AD1-056/057 AD1-074/075/076	Reconductor 1.87 miles of one side of double circuit 230kV line plus terminal equipment	\$10 M*	24 months*

* Transmission Planning level estimates

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 AD1 cluster. Some of the identified upgrades are Contingent Upgrades assigned to earlier queued requests. Power flow analysis found overloading issues that must be mitigated. Required upgrades and assigned costs are listed below.

AD1-022/023 Assigned and Contingent Upgrades	Assigned Cost
Reconductor Rocky Mount-Battleboro 115kV line	\$0
Construct Phase Shifter Station in Rocky Mount-Battleboro 115kV line, or PJM potential project to reconfigure 115kV lines	\$25,000,000 or \$0
Reconductor Greenville-Everetts 230kV line	\$10,000,000
Total for AD1-022/023	-

AD1-056/057 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
Total for AD1-056/057	\$0

AD1-074/075/076 Assigned and Contingent Upgrades	Assigned Cost
Reconductor Greenville-Everetts 230kV line	\$0
Total for AD1-074/075/076	\$0

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

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