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May 25, 2022

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

**RE: *In the matter of the Applications of Macadamia Solar, LLC
in Consolidated Dockets EMP-119 Subs 0 and 1
SECOND SUPPLEMENTAL PRE-FILED TESTIMONY OF
DONNA ROBICHAUD***

Dear Ms. Dunston:

On behalf of Macadamia Solar, LLC, in the above referenced matter and consolidated dockets, I herewith provide the Second Supplemental Pre-filed Testimony and Exhibits of Donna Robichaud.

Thank you for your assistance with this application. Should you have any questions concerning this filing, please do not hesitate to contact me.

Sincerely,

/s/ Benjamin L. Snowden

Benjamin L. Snowden

pbb

Copy to: Parties of Record
Counsel of Record

A Pennsylvania Limited Liability Partnership

California Colorado Delaware District of Columbia Florida Georgia Illinois Minnesota
Nevada New Jersey New York North Carolina Pennsylvania South Carolina Texas Washington

**SECOND SUPPLEMENTAL PREFILED TESTIMONY OF
DONNA ROBICHAUD
ON BEHALF OF MACADAMIA SOLAR LLC**

**NCUC DOCKET NO. EMP-119, SUB 0
NCUC DOCKET NO. EMP-119, SUB 1
(CONSOLIDATED DOCKETS)**

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 has changed to 1000 NC Music Factory Blvd, Suite – C3, Charlotte, NC 28206.

Q. ARE YOU THE SAME DONNA ROBICHAUD THAT PROVIDED DIRECT TESTIMONY IN THESE CONSOLIDATED DOCKETS ON AUGUST 31, 2021 SUPPLEMENTAL TESTIMONY ON OCTOBER 20, 2021, AND REBUTTAL TESTIMONY ON DECEMBER 10, 2021?

A. I am.

Q. WHAT IS THE PURPOSE OF YOUR SECOND SUPPLEMENTAL TESTIMONY?

A. My testimony is intended to provide additional information regarding updated interconnection studies for the proposed Macadamia Solar project received from PJM Interconnection.

I. Interconnection Studies

Q. PLEASE LIST ALL INTERCONNECTION STUDIES RECEIVED FOR THE PROPOSED FACILITY.

1 A. Macadamia Solar has received the following studies:

2 ○ Generation Interconnection Feasibility Study Report for PJM Generation
3 Interconnection Request Queue Position AD1-074/AD1-075/AD1-076
4 (February 2018), filed as Attachment A to my Prefiled Direct Testimony on
5 August 30, 2021.

6 ○ Generation Interconnection System Impact Study (“SIS”) Report for PJM
7 Generation Interconnection Request Queue Position AD1-074/75/76, Revision
8 0 (Dec. 2019) (“December 2019 SIS Report”), filed as Attachment B to my
9 Prefiled Direct Testimony on August 30, 2021. This report has been superseded
10 by later SIS reports.

11 ○ Generation Interconnection System Impact Study (“SIS”) Report for PJM
12 Generation Interconnection Request Queue Position AD1-074/75/76, Revision
13 1 (Feb. 2022) (“February 2022 SIS Report”) (**Exhibit A**). This report was a re-
14 tool of the December 2019 SIS Report and was superseded by re-tooled studies
15 received in May 2022 (discussed below).

16 ○ Generation Interconnection System Impact Study (“SIS”) Report for PJM
17 Generation Interconnection Request Queue Position AD1-074/75/76 (Revision
18 2) (May 2022) (“May 2022 SIS Report”) (**Exhibit B**). This report was a re-tool
19 of the February 2022 SIS Report but was superseded by a revised study received
20 later in May 2022 (discussed below).

21 ○ Generation Interconnection System Impact Study (“SIS”) Report for PJM
22 Generation Interconnection Request Queue Position AD1-074/75/76 (Revision
23 3) (May 2022) (“Revised May 2022 SIS Report”) (**Exhibit C**). The Revised

1 May 2022 SIS Report updated costs based on a completed facilities study.¹ It
2 is the most current SIS Report and supersedes all previous SIS reports.

- 3 ○ Affected System Study for Cluster AD1 by Duke Energy Progress LLC
4 (“DEP”) (Apr. 5, 2021), filed as Attachment C to my Prefiled Direct Testimony
5 on August 30, 2021.
- 6 ○ Affected System Study for Cluster AD1 by Duke Energy Progress LLC (Sept.
7 9, 2021) (“September 2021 Affected System Study”), filed as Attachment A to
8 my Supplemental Prefiled Testimony, filed in these dockets on October 20,
9 2021.

10 Macadamia Solar is one of the earliest-queued active projects in the Dominion
11 territory of PJM without an executed Interconnection Service Agreement (“ISA”). As a
12 result, Applicant does not expect any further retools of the PJM SIS.

13 However, DEP has indicated that it expects to issue another revision to the
14 September 2021 Affected System Study in June 2022, based on the re-tooled PJM studies
15 for the AD1 cluster. Based on conversations with PJM, we do not expect any change in
16 the nature or scope of the upgrades required to DEP’s system (which are discussed below).

17 **Q. HAS MACADAMIA SOLAR BEEN ALLOCATED ANY COSTS**
18 **FOR SHARED NETWORK UPGRADES IN THE REVISED MAY 2022 SIS**
19 **REPORT?**

20 A. Yes. There are six shared Network Upgrades identified in Revised May
21 2022 SIS Report. Macadamia Solar is allocated all or a portion of the Network Upgrades

¹ Macadamia Solar has not yet received a completed facilities study report from PJM. It anticipates receiving a report along with an executable Interconnection Service Agreement for the project.

1 identified as n6143, n6314, n6142, n6287, n6287.1, and n6144. Prior to being placed in
2 service, a deliverability study is required to determine which Network Upgrades may need
3 to be in-service prior to Macadamia Solar reaching commercial operation.

4 **Table 1: PJM Network Upgrades identified in the Revised May 2022 SIS Report**

Upgrade	Description	Cost (\$M)
n6143	Rebuild 5.88 miles of the Five Points – Wharton 115 kV line #189	14.5
n6314	Rebuild 10.28 miles of the Shawboro-Elizabeth City 230 KV line #2021	25.3
n6142	Rebuild 5.14 miles of the AB2-169 Tap – Five Points D.P. 115 kV line #189	13.6
n6287	Reconfigure Trowbridge Substation	8.1
n6287.1	Add additional 230 kV breaker at Trowbridge	0.62
n6144	Rebuild the 20.5 miles of Dominion 230 kV line #218 Everetts-Greenville	39.9

5 Compared to the December 2019 SIS Report, the allocated Network Upgrade costs
6 for Macadamia Solar decreased from \$126,667,432 to \$97,759,864. This is mainly due to
7 certain Network Upgrades no longer being triggered by Macadamia Solar due to the
8 withdrawal of other projects from the interconnection queue.

9 **Q. WILL MACADAMIA RECEIVE ANY REIMBURSEMENT FROM**
10 **RATEPAYERS FOR THE COST OF THOSE UPGRADES?**

11 A. No. As discussed on pages 7-8 of my August 31, 2021, Prefiled Testimony,
12 the cost of the Network Upgrades allocated to Macadamia in the Revised May 2022 SIS
13 will not be reimbursed by ratepayers.

14 It is possible that if a subsequently queued project, AD2-051, executes an
15 Interconnection Service Agreement (“ISA”) with PJM, it could reimburse Macadamia for
16 a portion of the cost of n6314 and n6144.

17 **Q. DO YOU EXPECT TO RECEIVE ANY FURTHER**
18 **INTERCONNECTION STUDIES OR AGREEMENTS FROM PJM?**

1 A. Yes. The Project anticipates receiving a Facilities Study Report, ISA, and
2 Construction Service Agreement in December 2022. The Facilities Study Report and these
3 agreements will identify with more precision the cost and timing of the PJM Network
4 Upgrades required for Macadamia Solar but will not change the nature of those upgrades.
5 Sixty days after receiving the ISA, Applicant is required to provide security and execute
6 the ISA to remain in the queue.

7 **II. PJM's Queue Reform Process**

8 **Q. COULD YOU PLEASE DESCRIBE PJM'S CURRENT QUEUE**
9 **REFORM PROPOSAL?**

10 A. As a result of rapid growth in renewable generation development, PJM had
11 experienced a rapid increase in interconnection requests over the last several years,
12 resulting in a significant backlog interconnection requests. As of December 2021, there
13 were almost 2500 interconnection requests in the PJM queue, totaling more than 225,000
14 MW of renewable energy and storage capacity.²

15 In early 2021, PJM initiated a stakeholder process to consider reforms to its
16 interconnection procedures. The goal of these changes is to process requests more
17 efficiently, both by clearing speculative projects from the PJM queue and also by
18 converting PJM's study process to a more stringent cycle-based cluster. Although PJM
19 currently uses cluster-based models in its analyses, interconnection requests are actually
20 processed in a serial manner once ISAs are executed.

21 In February 2022, PJM's Planning Committee approved a queue reform proposal
22 that includes a plan for transitioning from the current system. The proposal incorporates

² [20220427-pjm-members-endorse-plans-to-revamp-and-improve-the-generation-interconnection-process.ashx](#)

1 several features intended to eliminate speculative projects, including readiness payments,
2 increased study fees, additional demonstrations of site control, and withdrawal penalties.
3 All these changes were focused on processing mature projects that are ready to move
4 forward more efficiently.

5 **Q. WHAT IS THE CURRENT STATUS OF THE PJM QUEUE**
6 **REFORM?**

7 A. PJM is finalizing changes to its tariff to correspond to the changes approved
8 by PJM members³. PJM plans to file the proposal with the Federal Energy Regulatory
9 Commission (FERC) in May 2022. FERC approval is expected late 2022 or early 2023.
10 Once approved, PJM will begin the transition to the new process, provided all projects in
11 the AD2 and prior clusters have completed the study process.⁴ Otherwise, the transition
12 will begin after those projects have been completed. Projects in the AE1 to AG1 clusters
13 will be transferred to the “Fast Track” or Transition Cycle #1. The Fast Track is like the
14 current process, but with increased readiness deposits and site control requirements. If a
15 project in the AE1-AG1 cluster contributes to a Network Upgrade greater than \$5 million,
16 it will be put in Transition Cycle #1. Projects in the AG2 and AH1 cluster will be processed
17 in Transition Cycle #2. Almost all the new rules will apply to Transition Cycle #1 and #2.
18 Projects in the AH2 and after clusters will be processed using the complete set of new rules.

19 **Q. WILL THE PROPOSED QUEUE REFORM IMPACT**
20 **MACADAMIA SOLAR?**

21 A. PJM’s Queue Reform proposal will result in minimal impacts to Macadamia

³ [20220427-pjm-members-endorse-plans-to-revamp-and-improve-the-generation-interconnection-process.ashx](https://www.pjm.com/-/media/committees-groups/committees/mc/2022/20220427/20220427-item-01a-1-interconnection-process-reform-presentation.ashx)

⁴ <https://www.pjm.com/-/media/committees-groups/committees/mc/2022/20220427/20220427-item-01a-1-interconnection-process-reform-presentation.ashx>

1 Solar, because projects in the AD2 queue cluster and before are “grandfathered” into the
2 current process. The only expected change is the limit to cost allocation of Network
3 Upgrades above \$5 million to projects in AD2 cluster and before. Projects in the AE1
4 cluster and after that contribute to overloads triggered prior to the AE1 cluster will no
5 longer receive cost allocations for those upgrades.

6 PJM’s queue reform is likely to have positive commercial impacts on Macadamia
7 Solar because it will reduce the number of speculative projects in the PJM queue, and
8 because PJM is putting a hold on processing new interconnection requests during the two-
9 year transition period. At least for the next few years, then, there will be fewer available
10 project to satisfy the huge demand for renewable energy in PJM.

11 **III. Levelized Cost of Transmission Calculations**

12 **Q. PLEASE CALCULATE THE LEVELIZED COST OF**
13 **TRANSMISSION (LCOT) FOR ANY REQUIRED TRANSMISSION SYSTEM**
14 **UPGRADES OR MODIFICATIONS FOR THE PROJECT.**

15 A. The Applicant has prepared a revised LCOT calculations based on the
16 allocated cost of Network Upgrades provided in Revised May 2022 SIS Report. This yields
17 a revised LCOT of \$3.76/MWh. The Applicant’s LCOT analysis is detailed in
18 **Confidential Exhibit D**. The Project will bear the cost of these Network Upgrades, which
19 will not be passed on to ratepayers.

20 The Applicant has also prepared LCOT calculations for Affected System Upgrades
21 on DEP’s system that might need to be completed before the Project can be fully
22 deliverable. These are discussed below.

23 **Q. ARE YOU AWARE OF ANY SYSTEM OTHER THAN THE**

1 **STUDIED SYSTEM THAT IS OR WILL BE AFFECTED BY THE**
2 **INTERCONNECTION OF THE PROJECT? IF SO, EXPLAIN THE IMPACT AND**
3 **BASIS.**

4 A. Yes. Macadamia Solar and other projects in the AD1 cluster contribute to
5 an overload on the DEP portion of the Everetts-Greenville 230 kv tie-line between
6 Dominion and DEP (DEP003) (“the DEP Overload”). Resolving this overload will require
7 reconductoring two miles of 230 kV Everetts-Greenville line, upgrading disconnect
8 switches and CT ratios for a total cost of \$10 million (“the DEP Upgrade”). Macadamia
9 Solar contributes to the DEP Overload but was not assigned any cost for the DEP Upgrade⁵
10 because the Sumac Solar (AD1-022) and Sweetleaf Solar (AD1-056/57) projects contribute
11 to the overload before Macadamia Solar (AD1-074/75/76). Sumac Solar was assigned the
12 cost of the DEP Upgrade in the prior Affected System Studies for the AD1 cluster, and is
13 expected to continue to be assigned the cost of the upgrade when the revised Affected
14 System Study for the AD1 cluster is released (which is expected in June 2022). However,
15 as discussed below, Macadamia Solar is seeking to negotiate an Affected System Operating
16 Agreement with DEP to fund the DEP Upgrade, **without** reimbursement from DEP
17 ratepayers.

18 **Q. HAVE YOU PREPARED LCOT CALCULATIONS FOR THESE**
19 **AFFECTED SYSTEM UPGRADES?**

20 A. Yes, I have prepared LCOT calculations for the DEP Upgrade, based on the
21 cost estimates in the September 2021 Affected System Study. According to that study, the
22 estimated cost of the upgrade is \$10,000,000.

⁵ See page 18 of the Revised May 2022 SIS Report.

1 My LCOT calculations are detailed in Confidential **Exhibit D**. If all the projects
2 in the AD1 cluster that benefit from the proposed DEP Upgrade (Sumac Solar, Sweetleaf
3 Solar, and Macadamia Solar) are included in the calculation, the estimated LCOT for this
4 upgrade is \$0.28/MWh, which is much lower than the benchmark LCOT figures that the
5 Commission and the Public Staff have considered reasonable in other CPCN proceedings.

6 If only Macadamia's output were considered, the LCOT of the DEP Upgrade would
7 be \$0.38/MWh, which is still extremely low in comparison to benchmark LCOT figures.

8 **Q. DO YOU EXPECT ANY FURTHER INTERCONNECTION**
9 **STUDIES OR AGREEMENTS FROM DEP?**

10 A. Yes. As discussed, the Project anticipates receiving a revised Affected
11 System Study for PJM's AD1 cluster in June 2022. In previous Affected System Studies
12 for the AD1 cluster, Macadamia Solar was not considered the first to cause impacts on
13 DEP's system, and was not assigned any cost for upgrades. However, Macadamia Solar
14 does contribute to the DEP Overload and expects the revised report to confirm that it will
15 continue to contribute to the overload. In the interest of moving this upgrade forward,
16 Macadamia Solar has decided to step up and fund the DEP Upgrade without
17 reimbursement, even though it is not considered the first to cause the overload.

18 After receipt of the Affected System Study, Macadamia Solar expects to execute
19 an Affected System Operating Agreement ("MS-DEP ASOA") with DEP. On May 10,
20 2022, Macadamia Solar requested that DEP begin negotiations of the MS-DEP ASOA for
21 the DEP Upgrade. Macadamia Solar also informed DEP that it does not intend to seek
22 reimbursement for the cost of upgrades constructed under the MS-DEP ASOA, and that it
23 plans to submit a filing to FERC requesting approval of the MS-DEP ASOA. Negotiations

1 on a MS-DEP ASOA are expected to begin after the revised Affected System Study is
2 completed.

3 **Q. DOES MACADAMIA SOLAR PLAN TO SEEK REIMBURSEMENT**
4 **FROM DEP'S RATEPAYERS FOR THE COST OF THE DEP UPGRADE?**

5 A. No. Given the relatively low cost of the DEP Upgrade in comparison to the
6 overall cost of the Macadamia Solar project, and in recognition of the Commission's
7 concerns about ratepayer impacts of upgrades triggered by merchant facilities, Macadamia
8 Solar believes that it is reasonable to forego its right to receive reimbursement from DEP's
9 ratepayers for the cost of that Upgrade. Macadamia Solar would accept a condition in its
10 CPCN prohibiting it from seeking such reimbursement, without prejudice to any right to
11 seek partial reimbursement from other projects that contribute to the overload.

12 **Q. NOTWITHSTANDING ITS AGREEMENT NOT TO SEEK**
13 **REIMBURSEMENT FOR THE COST OF THE DEP UPGRADE, DO YOU STILL**
14 **BELIEVE THAT THIS UPGRADE WILL PROVIDE BENEFITS FOR DEP'S**
15 **RATEPAYERS?**

16 A. I do, largely for the reasons stated in my Prefiled Rebuttal Testimony filed
17 on behalf of Macadamia Solar on December 10, 2021. The ratepayer benefits cited in my
18 testimony have become even more important with the passage of H.B. 951, which will
19 require deployment of significant additional renewable resources on DEP's system.
20 Because Macadamia has agreed to forego reimbursement, the approval of this project by
21 the Commission will not only satisfy the need for additional renewable energy in PJM but
22 will also create additional benefits for DEP's ratepayers.

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

1 A. Yes.

CERTIFICATE OF SERVICE

This is to certify that the undersigned has this day served the foregoing **SECOND SUPPLEMENTAL PREFILED TESTIMONY OF DONNA ROBICHAUD** upon the following by electronic mail as follows:

Christopher Ayers, Esq.
Executive Director - NC Public Staff
Chris.Ayers@psncuc.nc.gov

Nadia Luhr
NC Public Staff - Legal Division
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NC Public Staff - Legal Division
4326 Mail Service Center
Raleigh, NC 27599

This the 25th day of May 2022.

/s/ Benjamin L. Snowden
Benjamin L. Snowden

NCUC DOCKET NO. EMP-119, SUB 0
NCUC DOCKET NO. EMP-119, SUB 1

SECOND SUPPLEMENTAL PRE-FILED TESTIMONY OF
DONNA ROBICHAUD
ON BEHALF OF MACADAMIA SOLAR LLC

EXHIBITS

A	Generation Interconnection System Impact Report for PJM Generation Interconnection Request Queue Position AD1-074/75/76 (Revision 1) (February 2022)
B	Generation Interconnection System Impact Report for PJM Generation Interconnection Request Queue Position AD1-074/75/76 (Revision 2) (May 2022)
C	Generation Interconnection System Impact Report for PJM Generation Interconnection Request Queue Position AD1-074/75/76 (Revision 3) (May 2022)
D	LCOT Analysis for Network Upgrades potentially required for Macadamia Solar Project and for Potential DEP Affected System Upgrades **CONFIDENTIAL**

**NCUC DOCKET NO. EMP-119, SUB 0
NCUC DOCKET NO. EMP-119, SUB 1**

**SECOND SUPPLEMENTAL PRE-FILED TESTIMONY OF
DONNA ROBICHAUD
ON BEHALF OF MACADAMIA SOLAR LLC**

EXHIBIT A

OFFICIAL COPY

May 25 2022

**NCUC DOCKET NO. EMP-119, SUB 0
NCUC DOCKET NO. EMP-119, SUB 1**

**SECOND SUPPLEMENTAL PRE-FILED TESTIMONY OF
DONNA ROBICHAUD
ON BEHALF OF MACADAMIA SOLAR LLC**

EXHIBIT B

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May 25 2022

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

EXHIBIT C

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May 25 2022

**NCUC DOCKET NO. EMP-119, SUB 0
NCUC DOCKET NO. EMP-119, SUB 1**

**SECOND SUPPLEMENTAL PRE-FILED TESTIMONY OF
DONNA ROBICHAUD
ON BEHALF OF MACADAMIA SOLAR LLC**

EXHIBIT D

**** CONFIDENTIAL ****

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May 25 2022