



**NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION**

September 29, 2021

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

Re: **Docket No. EMP-118, Subs 0 and 1** – Application for a Certificate of Public Convenience and Necessity to Construct a 189-MW Wind Facility in Chowan County, North Carolina and Application for a Certificate of Environmental Compatibility and Public Convenience and Necessity to Construct Approximately 6.0 miles of a new 230kV transmission line in Chowan County, North Carolina

Dear Ms. Dunston:

In connection with the above-referenced docket, we transmit herewith for filing on behalf of the Public Staff the testimony of Jeff T. Thomas, Engineer, Energy Division.

By copy of this letter, we are forwarding a copy of the redacted 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,

/s/ Reita D. Coxton
Staff Attorney
reita.coxton@psncuc.nc.gov

Attachment(s)

Executive Director
(919) 733-2435

Accounting
(919) 733-4279

Consumer Services
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Economic Research
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NOS. EMP-118, SUBS 0 AND 1

Testimony of Jeff T. Thomas
On Behalf of the Public Staff
North Carolina Utilities Commission

September 29, 2021

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

2 A. My name is Jeff T. Thomas. My business address is 430 North Salisbury
3 Street, Raleigh, North Carolina.

4 Q. BRIEFLY STATE YOUR QUALIFICATIONS AND DUTIES.

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

6 Q. WHAT IS YOUR POSITION WITH THE PUBLIC STAFF – NORTH
7 CAROLINA UTILITIES COMMISSION (PUBLIC STAFF)?

8 A. I am an engineer in the Operations and Planning Section of the Public
9 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 North
13 Carolina Utilities Commission (Commission) on the application, testimony,

1 and related filings for a wind energy facility and associated transmission line
2 in Chowan County, North Carolina.

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

4 A. On June 14, 2021, Timbermill Wind, LLC (Timbermill Wind or the Applicant),
5 an indirect subsidiary of Apex Clean Energy Holdings, LLC, filed an
6 application for a Certificate of Public Convenience and Necessity (CPCN)
7 to construct a 189-megawatt alternating current (MW) wind energy
8 generating facility (the Facility) in Docket No. EMP-118, Sub 0.
9 Contemporaneously, Timbermill Wind filed a Registration Statement for the
10 Facility. The application included the testimony of witnesses Ellen Balfrey,
11 Jimmy Merrick, Deepesh Rana, Jeremy Spaeth, and Emmanuel Wemakoy.
12 The Facility will be located in Dominion Energy North Carolina (DENC)
13 territory, which is part of PJM Interconnection, L.L.C. (PJM).

14 On June 21, 2021, Timbermill Wind filed an application for a Certificate of
15 Environmental Compatibility and Public Convenience and Necessity
16 (CECPCN) in Docket No. EMP-118, Sub 1, to construct a six-mile, 230-
17 kilovolt (kV) transmission line to connect the Facility to DENC's transmission
18 system. The application included the testimony of witnesses Brie Anderson,
19 Jimmy Merrick, Jeremy Spaeth, and Emmanuel Wemakoy.

20 On June 22, 2021, the Commission issued its *Order Scheduling Public*
21 *Hearing, Requiring Public Notice, and Requiring Clearinghouse Review in*

1 Docket No. EMP-118, Sub 1. Also on June 22, 2021, the Commission sent
2 a letter to the State Environmental Review Clearinghouse (State
3 Clearinghouse) along with the CECPCN application for review.

4 On June 28, 2021, the Public Staff filed a Notice of Completeness for the
5 CPCN application.

6 On June 29, 2021, the Applicant filed supplemental information regarding
7 construction costs.

8 On July 22, 2021, the Commission issued its *Order Consolidating Dockets,*
9 *Scheduling Hearings, Requiring Filing of Testimony, Establishing*
10 *Procedural Guidelines, and Requiring Public Notice* (July Order),
11 consolidating the CPCN and CECPCN proceedings and requiring the filing
12 of additional testimony and exhibits addressing the questions listed below.
13 Also on July 22, 2021, the Commission sent a letter to the State
14 Clearinghouse along with the CPCN application for review.

15 On July 27, 2021, Patrick Flynn filed a Petition to Intervene in both dockets.
16 On August 11, 2021, Timbermill Wind filed a Motion to Deny Petition to
17 Intervene.

18 Also on August 11, 2021, the State Clearinghouse filed comments in Docket
19 No. EMP-118, Sub 1, requesting additional information for the North
20 Carolina Department of Natural and Cultural Resources (DNCR). The State
21 Clearinghouse made a similar filing in Docket No. EMP-118, Sub 0 on

1 August 26, 2021. I describe the State Clearinghouse comments more fully
2 below.

3 On August 25, 2021, the Applicant filed the Supplemental Testimony of
4 Jimmy Merrick in response to the Commission's July Order.

5 On September 21, 2021, the Applicant filed an Updated Site Plan detailing
6 changes to several access roads, turbine locations, collection lines,
7 meteorological towers, and the laydown yard and operations and
8 management structure.

9 **I. COMPLIANCE WITH THE JULY ORDER**

10 **Q. PLEASE DESCRIBE THE QUESTIONS THAT THE COMMISSION**
11 **INCLUDED IN ITS JULY ORDER.**

12 A. In its July Order, the Commission noted the increase in merchant plant
13 facility applications and recognized its statutory duty to examine the long-
14 range needs for the generation of electricity in North Carolina. It directed
15 the Applicant to file additional testimony and exhibits addressing the
16 following questions regarding the Facility, to the extent they were not
17 answered in the application:

18 1. Provide the amount of network upgrades on DENC's or
19 any affected system's transmission system, if any,
20 required to accommodate the operation of Timbermill
21 Wind's proposed facility.

- 1 2. Provide the Levelized Cost of Transmission (LCOT)
2 information for any required transmission system
3 upgrades or modifications.
- 4 3. Provide any interconnection study received for the
5 Facility. If Timbermill Wind has not received a study,
6 provide a date by when the study is expected to be
7 completed.
- 8 4. If Timbermill Wind is aware of any system other than
9 the studied system that is or will be affected by the
10 interconnection, explain the impact and basis.
- 11 5. If Timbermill Wind proposes to sell energy and capacity
12 from the facility to a distribution utility regulated by the
13 Commission, provide a discussion of how the Facility's
14 output conforms to or varies from the regulated utility's
15 most recent integrated resource plan (IRP).
- 16 6. If Timbermill Wind proposes to sell energy and capacity
17 from the facility to a purchaser who is subject to a
18 statutory or regulatory mandate with respect to its
19 energy sourcing (e.g., a Renewable Energy Portfolio
20 Standard (REPS) requirement or Virginia's new
21 statutory mandate for renewables), explain how, if at
22 all, the Facility will assist or enable compliance with that
23 mandate. Provide any contracts that support that
24 compliance.
- 25 7. Provide any Power Purchase Agreements (PPA),
26 Renewable Energy Certificate (REC) sale contracts, or
27 contracts for compensation for environmental
28 attributes for the output of the Facility, if available.

29 On August 25, 2021, Timbermill Wind filed the additional testimony and
30 exhibits of witness Merrick in response to these questions.

31 **II. FACILITY OVERVIEW**

32 **Q. PLEASE PROVIDE A DESCRIPTION OF THE FACILITY.**

1 A. The Facility, related transmission line, and interconnection switching
2 station, are located on approximately 6,300 acres in central Chowan
3 County, north of Edenton. The Applicant has established site control for the
4 site through leases and easements with approximately 37 separate
5 landowners and been granted a Conditional Use Permit (CUP) by Chowan
6 County.¹ Timbermill Wind will improve and utilize existing access roads
7 where possible. New access roads will be constructed, if necessary, to
8 reach each planned turbine.

9 The Facility will consist of up to 45 wind turbine generators, each with an
10 anticipated nameplate capacity of 4.2 MW. Each turbine will have a
11 maximum hub height² of 345 feet, with a total turbine height³ of no more
12 than 599 feet. Each turbine will be connected to a Supervisory Control and
13 Data Acquisition (SCADA) system, allowing real-time monitoring by
14 operations and maintenance (O&M) staff and remotely. The turbines will be
15 monitored remotely 24 hours a day, seven days a week, and on-site O&M
16 staff will have control of each turbine at the on-site O&M office. The turbines
17 will be electrically connected via underground 34.5 kV electrical collector
18 lines, which will feed into a centrally located collector substation. At the
19 collector substation, the voltage is stepped up to 230 kV and conveyed to

¹ The CUP deadline was extended by several laws that were enacted due to the COVID-19 pandemic.

² Measured from the base of the tower to the center of the rotor hub on top of the tower.

³ Measured from the base of the tower to highest blade tip position.

1 the interconnection switching station, owned and operated by DENC, via a
2 six-mile aboveground transmission line.

3 **Q. DID THE UPDATED SITE PLAN IMPACT THE PUBLIC STAFF'S**
4 **REVIEW?**

5 A. No. The site plan changes did not add or remove any property parcels within
6 the site. The O&M office and the temporary laydown yard were relocated,
7 but there were no changes to the collector substation, the interconnection
8 substation, or the transmission line route. Some access roads, underground
9 collector lines, and individual turbines and met towers were moved slightly,
10 but these minor changes do not impact the Public Staff's recommendations
11 at this time.

12 **Q. PLEASE DESCRIBE THE TRANSMISSION LINE.**

13 A. The transmission line will connect the collector substation, owned and
14 operated by Timbermill Wind, to the interconnection switching station,
15 through the Transmission Corridor. Most of the corridor will be
16 approximately 150 feet wide with a short span that will be 75 feet wide. The
17 line will be supported primarily by H-frame structures and steel monopoles
18 will be used where necessary. Both types of structures are anticipated to be
19 75 to 120 feet tall. The environmental report required by Commission Rule
20 R8-62(c)(4) was included with the Application.

1 Approximately two thirds of the Transmission Corridor is located on the
2 property containing the Facility. The remaining one third is located from the
3 southeast corner of the Facility to the interconnection switching station.
4 Timbermill Wind determined the route through discussions with landowners
5 in a manner designed to maximize the owners' continued use of the
6 remainder of their property. The Transmission Corridor is located on land
7 belonging to willing landowners because Timbermill Wind does not have the
8 right of eminent domain. No alternative routes were proposed in the
9 CECPCN application.

10 **Q. WHY IS THE FACILITY NEEDED?**

11 A. According to Timbermill Wind, the Facility is needed because of the North
12 Carolina Renewable Energy and Energy Efficiency Portfolio Standard
13 (REPS); the most recently filed Integrated Resource Plans (IRPs) of Duke
14 Energy Carolinas, LLC (DEC), Duke Energy Progress, LLC (DEP), and
15 DENC; the Virginia Clean Energy Economy Act (VCEA); and corporate and
16 industrial demand for renewable energy. While Timbermill Wind has not
17 entered into any firm contracts for its output as of the date of the application,
18 it has been in discussions with multiple parties related to the sale of
19 Renewable Energy Certificates (RECs), the Facility output, or the Facility
20 itself. Timbermill Wind also states that its Facility has higher generation
21 during peak-load winter hours, which will help meet capacity needs in the
22 region.

1 The Public Staff notes that the VCEA establishes a renewable energy
2 portfolio standard (RPS) that can be met with out-of-state resources
3 connected to the PJM system.⁴ In addition, DEC and DEP anticipate
4 requiring 150 MW and 600 MW, respectively, of onshore wind resources by
5 2035 in their 2020 IRP, Portfolio B.

6 **Q. WHAT IS THE ESTIMATED COST OF THE FACILITY?**

7 A. Timbermill Wind estimates the total cost of the facility to be [BEGIN
8 **CONFIDENTIAL**] [REDACTED] [END CONFIDENTIAL], which includes \$3.5
9 million for the transmission line and \$7 million for associated network
10 upgrades.

11 **Q. DOES THE PUBLIC STAFF HAVE ANY CONCERNS ABOUT FACILITY**
12 **DECOMMISSIONING?**

13 A. Although the decommissioning of electric merchant facilities is outside the
14 purview of the Commission, the Public Staff reviewed the Chowan County
15 CUP and can confirm that Chowan County considered the eventual
16 decommissioning of the Facility in its permitting process. Timbermill Wind
17 is required to post a bond to cover all decommissioning costs. The
18 sufficiency of the bond will be reviewed every two years.

⁴ While the VCEA requires Dominion Energy to construct or procure at least 16,100 MW of new solar or onshore wind resources by December 31, 2035 (Va Code Ann. § 56-585.5(D)(2) (2021)), this requirement must be met by in-state resources only. The relevant RPS portion which allows out-of-state resources is described in Va Code Ann. § 56-585.5(C) (2021).

1 **III. NETWORK UPGRADES AND AFFECTED SYSTEM UPGRADES**

2 **Q. PLEASE PROVIDE A BRIEF HISTORY OF THE INTERCONNECTION**
3 **PROCESS FOR THE FACILITY.**

4 A. Timbermill Wind filed an interconnection request with PJM in July 2013, and
5 was assigned queue number Z1-036. At the time, the proposed project was
6 300 MW; the project size was reduced to 189 MW, which is permitted by
7 PJM's interconnection procedures without affecting queue position or
8 triggering a new study. PJM finalized the Facilities Study Report in
9 September 2015. Timbermill Wind entered into an Interconnection Service
10 Agreement and an Interconnection Construction Services Agreement with
11 DENC in December 2015. In May 2020, Timbermill Wind requested that the
12 Facility be put into suspension while permitting work continued. The project
13 may remain in suspension for up to three years without losing its queue
14 position.

15 Once the project exits suspension, PJM and DENC will review the Facility
16 and, if DENC's technical interconnections standards have materially
17 changed since the original study, PJM may restudy the Facility. Costs for
18 the scope of work will also be re-evaluated and updated to accommodate
19 inflation and elapsed time. As a result of the prior PJM studies, the Facility's
20 queue position and suspension, the Facility and its associated network
21 upgrades are included in the baseline for all PJM studies in later queue

1 positions. As a result, once the Facility exits suspension, it is highly unlikely
2 that PJM or DENC will identify any additional, significant upgrade costs.

3 **Q. WILL THE FACILITY REQUIRE ANY NETWORK UPGRADES?**

4 A. Yes. Pages 2 and 3 of witness Rana's direct testimony provide an itemized
5 list of required network upgrades totaling \$7,093,084. PJM will allocate the
6 cost responsibility for these upgrades to Timbermill Wind.

7 **Q. WILL NORTH CAROLINA RATEPAYERS BE RESPONSIBLE FOR ANY**
8 **OF THE IDENTIFIED NETWORK UPGRADES?**

9 A. No. Timbermill Wind is solely responsible for paying 100% of the network
10 upgrade costs.

11 **Q. WILL THE FACILITY REQUIRE ANY AFFECTED SYSTEM UPGRADES?**

12 A. No. As recently as February 26, 2021, PJM representatives have confirmed
13 that the Timbermill Wind project does not rely on any affected system
14 upgrades.

15 **Q. WHAT IS THE LCOT FOR THE NETWORK UPGRADES?**

16 A. Witness Rana provides an LCOT estimate based upon the 2019 Lawrence
17 Berkeley National Laboratory Study (LBNL Study)⁵ referenced by the Public

⁵ Gorman, W., Mills, A., & Wisner, R. (2019). Improving estimates of transmission capital costs for utility scale wind and solar projects to inform renewable energy policy. Energy Policy, 135. DOI: <https://doi.org/10.1016/j.enpol.2019.110994>. Preprint version accessed at http://etapublications.lbl.gov/sites/default/files/td_costs_formatted_final.pdf.

1 Staff in Docket No. EMP-105, Sub 0. According to witness Rana, the
 2 estimated LCOT is \$0.90 assuming a transmission life of 60 years, and
 3 \$1.07 assuming a transmission life of 30 years. The Public Staff estimates
 4 the LCOT to be approximately \$0.73, based on a 60-year transmission
 5 asset life and a 4.4% discount rate.⁶ The below table compares the
 6 Timbermill Wind LCOT (as calculated by the Public Staff) to the LCOT of
 7 wind projects in the Midcontinent Independent System Operator (MISO)
 8 region, PJM, and other wind projects with data reported to the Energy
 9 Information Administration (EIA). Timbermill Wind's LCOT is in line with
 10 other wind projects in the region. In any case, as Timbermill Wind will be
 11 responsible for paying the upgrade costs, North Carolina ratepayers will not
 12 bear any portion of the cost.

Projects Analyzed		LCOT
Timbermill Wind (Public Staff calculation)		\$ 0.73
MISO	Overall	\$ 2.48
	Constructed	\$ 0.85
	Proposed	\$ 4.05
PJM	Overall	\$ 0.30
	Constructed	\$ 0.25
	Proposed	\$ 0.69
EIA	Overall	\$ 0.97

13 **Q. IS THE PUBLIC STAFF CONCERNED ABOUT THE FACILITY'S**
 14 **NETWORK UPGRADE COSTS OR LCOT?**

⁶ The LBNL Study uses a 4.4% discount rate in calculating its LCOT for MISO, PJM, and EIA projects. To compare Timbermill Wind to other wind projects from the LBNL Study, the Public Staff used the same discount rate across the board.

1 A. No. The Public Staff has provided the foregoing information about the
2 Facility's LCOT to provide the Commission with context, but the Facility's
3 LCOT is not a concern nor a determining factor in the Public Staff's
4 recommendation for this specific CPCN and CECPCN application because
5 none of these network upgrade costs will be borne by North Carolina
6 ratepayers.

7 **IV. COMMENTS BY THE STATE CLEARINGHOUSE**

8 **Q. PLEASE PROVIDE THE STATUS OF THE CLEARINGHOUSE REVIEW**
9 **OF THE CPCN.**

10 A. On August 26, 2021, the State Clearinghouse file a letter in Docket No.
11 EMP-118, Sub 0, indicating that the DNCR has requested that the Applicant
12 provide an archeological survey report for further review and comment. In
13 its letter, the DNCR recommends that the required survey be provided as a
14 condition for, and prior to, the issuance of a Certificate of Environmental
15 Compatibility. At this time, the Applicant has not resolved this issue.

16 **Q. PLEASE PROVIDE THE STATUS OF THE CLEARINGHOUSE REVIEW**
17 **OF THE CECPCN.**

18 A. On August 11, 2021, the State Clearinghouse filed a letter indicating that
19 the DNCR has requested that the Applicant provide an archeological survey
20 report for further review and comment. In its letter, the DNCR recommends
21 that the required survey be provided as "a condition for, and prior to the

1 issuance of a Certificate of Environmental Compatibility.”⁷ At this time, the
2 Applicant has not resolved this issue.

3 **V. OTHER ISSUES**

4 **Q. ARE THERE ANY OTHER ISSUES TO BRING TO THE COMMISSION’S**
5 **ATTENTION?**

6 A. Yes, but these issues are minor and do not affect the Public Staff’s
7 recommendations in this docket.

8 First, Timbermill Wind’s CUP to Chowan County stated that the turbines
9 used would be 3.6 MW, but, according to this application, it plans to use 4.2
10 MW turbines. Timbermill Wind states that at the time of the CUP application,
11 the turbine had not been selected and a representative turbine was used.
12 For the sound and shadow flicker studies, a “hybrid, fictional turbine using
13 maximum impacts” was utilized. Timbermill Wind states that the turbine
14 capacity is immaterial to the CUP and CUP Amendment because the
15 turbine height has not changed and the decommissioning costs are not
16 materially impacted.

17 Second, due to the number of site control agreements and the timeline of
18 the project, several of the site control agreements have expired or will expire
19 soon. Timbermill Wind has assured the Public Staff that it will remove

⁷ State Clearinghouse Comments, page 2, filed on August 11, 2021 in Docket No. EMP-118, Sub 1 and State Clearinghouse Comments, page 22, filed on August 26, 2021 in Docket No. EMP-118, Sub 0.

1 turbines from any parcels for which it is unable to secure a renewed site
2 control agreement and re-route internal site access roads and collection
3 lines to avoid those parcels.

4 Finally, the State Clearinghouse raised one issue in its comments in Docket
5 No. E-100, Sub 101 filed on July 30, 2021. The State Clearinghouse noted
6 that “numerous bat species are in the area but were not listed” and that this
7 issue would be addressed during the Wind Energy Permit process.⁸

8 **VI. PUBLIC COMMENT**

9 **Q. HAVE ANY CONSUMER STATEMENTS OF POSITION BEEN FILED?**

10 A. Yes, as of the filing of my testimony, twenty-eight statements have been
11 filed. Most statements support the project and cite project benefits, such as
12 increased Chowan County tax revenues and locally generated low-carbon
13 generation. Two consumers filed statements in opposition to the project and
14 cited concerns about cost, safety, and harm to the local ecosystem.

15 **VII. RECOMMENDATIONS**

16 **Q. WHAT ARE THE PUBLIC STAFF’S RECOMMENDATIONS ON**
17 **TIMBERMILL WIND’S APPLICATION?**

⁸ The North Carolina Department of Environmental Quality is responsible for reviewing and approving wind energy permit applications. See N.C.G.S. §§ 143-215.115 through 143-215.122.

1 A. The Public Staff has reviewed the applications, the testimony of Timbermill
2 Wind witnesses, statements of position, and the other evidence in this
3 docket. Based on this information, the Public Staff recommends that the
4 Commission issue the CPCN for the generating facility and the CECPCN
5 for the associated transmission line after the Applicant files a letter with the
6 Commission stating that it has resolved DNCR's concerns, with supporting
7 documentation. The Public Staff also recommends that the Commission
8 issue the certificates, subject to the following conditions:

9 i. The Applicant shall notify the Commission of any significant
10 change (greater than 10%) in the cost estimates for the
11 interconnection facilities, network upgrades, or affected system
12 costs within 30 days of becoming aware of such change;

13 ii. The Facility shall be constructed and operated in strict
14 accordance with applicable laws and regulations, including any
15 environmental permitting requirements; and

16 iii. The CPCN shall be subject to Commission Rule R8-63(e) and all
17 orders, rules and regulations as are now or may hereafter be
18 lawfully made by the Commission.

19 The Public Staff also recommends that the Registration Statement be
20 considered complete and that the facility be considered a new renewable
21 energy facility.

1 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

2 A. Yes, it does.

QUALIFICATIONS AND EXPERIENCE

JEFF T. THOMAS, PE

1
2
3 I graduated from the University of Illinois Champaign-Urbana in 2009,
4 earning a Bachelor of Science in General Engineering. From 2009 to 2015, I
5 worked in various operations management roles for General Electric, United
6 Technologies Corporation, and Danaher Corporation. I left manufacturing in 2015
7 to attend North Carolina State University (NCSU), earning a Master of Science
8 degree in Environmental Engineering. I performed cost-benefit analysis evaluating
9 smart grid components, such as solid-state transformers and grid edge devices, at
10 the Future Renewable Energy Electricity Delivery and Management Systems
11 Engineering Research Center during my studies at NCSU. My master's thesis
12 focused on electric power system modeling, capacity expansion planning, linear
13 optimization, and the effect of various state and national energy policies on North
14 Carolina's generation portfolio and electricity costs. After obtaining my degree, I
15 joined the Public Staff in November 2017. In my current role, I have filed testimony
16 in avoided cost proceedings, general rate cases, and CPCN applications, and have
17 been involved in the implementation of HB 589 programs, utility cost recovery,
18 renewable energy program management, customer complaints, and other aspects
19 of utility regulation. I received my Professional Engineering license in April 2020
20 after passing the Principles and Practice of Engineering exam in Electrical and
21 Computer Engineering: Power.