Jun 21 2021

PREFILED DIRECT TESTIMONY OF EMMANUEL WEMAKOY ON BEHALF OF TIMBERMILL WIND, LLC

NCUC DOCKET NO. EMP-118, SUB 1

| 1 INTRODUCTION | | | | | |
|---|--|---|---|--|--|
| Q. | PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS. | | | | |
| Α. | My name is | Emmanuel Wen | nakoy. I ar | n a Senior Elec | trical Engineer for |
| Apex Clean | Energy, Inc | . My business | address | is 310 4 th St. | NE, Suite 300, |
| 5 Charlottesville, VA 22902. | | | | | |
| Q. | PLEASE [| DESCRIBE YOU | JR EDUC | ATION AND | PROFESSIONAL |
| 7 EXPERIENCE. | | | | | |
| Α. | I completed | my bachelor's de | egree in Ele | ctrical Engineer | ing from St. Cloud |
| 9 State University, in St. Cloud, Minnesota, and I am currently pursuing my master's | | | | | |
| degree in Energy Systems at Arizona State University (anticipated graduation: May | | | | | |
| 1 2023). I am a licensed Professional Engineer (PE) in the State of Minnesota. I have | | | | | |
| been building and designing collection systems, transmission lines, and substations | | | | | |
| 13 throughout the United States for the past 7 years. | | | | | |
| Q. | PLEASE | SUMMARIZE | YOUR | CURRENT | EMPLOYMENT |
| 15 RESPONSIBILITIES. | | | | | |
| Α. | I manage a | nd coordinate teo | hnical asp | ects of renewab | le energy projects |
| from origination to construction and operations, including for the Timbermill Wind, LLC | | | | | |
| ("Timbermill") facility in Chowan County, NC (the "Facility"). I support the delivery of | | | | | |
| technical concepts and engineering design of projects at various stages of their life-cycle | | | | | |
| and manage third party electrical engineering and design work. | | | | | |
| Q. | A. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION? | | | | |
| Α. | No. | | | | |
| | A. Apex Clean Charlottesvill Q. EXPERIENC A. State Univer degree in Er 2023). I am been building throughout th Q. RESPONSIB A. from originati ("Timbermill") technical con and manage | A. My name is Apex Clean Energy, Inc. Charlottesville, VA 22902. Q. PLEASE I EXPERIENCE. A. I completed State University, in St. C degree in Energy System 2023). I am a licensed Pi been building and design throughout the United State Q. PLEASE RESPONSIBILITIES. A. I manage and from origination to construe ("Timbermill") facility in Clean and manage third party elean Q. HAVE YOU | Q. PLEASE STATE YOUR NAM A. My name is Emmanuel Wend Apex Clean Energy, Inc. My business Charlottesville, VA 22902. Q. PLEASE DESCRIBE YOU EXPERIENCE. A. I completed my bachelor's det State University, in St. Cloud, Minnesota, degree in Energy Systems at Arizona St 2023). I am a licensed Professional Engine been building and designing collection systems throughout the United States for the past 7 years Q. PLEASE SUMMARIZE RESPONSIBILITIES. A. I manage and coordinate tear ("Timbermill") facility in Chowan County, Notechnical concepts and engineering design of and manage third party electrical engineering Q. HAVE YOU PREVIOUSLY T | Q. PLEASE STATE YOUR NAME, TITLE A A. My name is Emmanuel Wemakoy. I ar Apex Clean Energy, Inc. My business address Charlottesville, VA 22902. Q. PLEASE DESCRIBE YOUR EDUCE EXPERIENCE. A. I completed my bachelor's degree in Election State University, in St. Cloud, Minnesota, and I am degree in Energy Systems at Arizona State University 2023). I am a licensed Professional Engineer (PE) in been building and designing collection systems, transitivoughout the United States for the past 7 years. Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES. A. I manage and coordinate technical aspect from origination to construction and operations, include ("Timbermill") facility in Chowan County, NC (the "Feetechnical concepts and engineering design of projects at and manage third party electrical engineering and design and the sign and the sign and manage third party electrical engineering and design and the sign and manage third party electrical engineering and design and the sign and manage third party electrical engineering and design and the sign and the si | Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS. A. My name is Emmanuel Wemakoy. I am a Senior Elect Apex Clean Energy, Inc. My business address is 310 4th St. Charlottesville, VA 22902. Q. PLEASE DESCRIBE YOUR EDUCATION AND EXPERIENCE. A. I completed my bachelor's degree in Electrical Engineer State University, in St. Cloud, Minnesota, and I am currently purse degree in Energy Systems at Arizona State University (anticipated 2023). I am a licensed Professional Engineer (PE) in the State of I been building and designing collection systems, transmission liness throughout the United States for the past 7 years. Q. PLEASE SUMMARIZE YOUR CURRENT RESPONSIBILITIES. A. I manage and coordinate technical aspects of renewab from origination to construction and operations, including for the Tim ("Timbermill") facility in Chowan County, NC (the "Facility"). I support technical concepts and engineering design of projects at various stage and manage third party electrical engineering and design work. Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS |

23 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY? PPAB 6279110v5

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24 Α. The purpose of my testimony is to support the Application for Certificate 25 of Public Convenience and Necessity to construct a merchant plant (the "CPCN 26 Application") and the Application for Certificate of Environmental Compatibility and 27 Public Convenience and Necessity (the "CECPCN Application") to construct an 28 approximately 6 mile 230kV transmission line (the "Timbermill Line") to interconnect the 29 Facility to the existing 230kV Winfall-Mackeys transmission line (the "Winfall Line") 30 owned by Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina 31 ("DENC").

32 Q. WERE YOU INVOLVED IN PREPARING TIMBERMILL'S CPCN and 33 CECPCN APPLICATIONS IN THE ABOVE-REFERENCED DOCKETS?

34 A. Yes.

35 Q. PLEASE BRIEFLY DESCRIBE THE FACILITY AND TIMBERMILL 36 LINE.

37 The Facility will consist of 45 Vestas V150-4.2MW turbines, or a turbine Α. 38 model with a substantially similar profile. The electrical collection lines will consist of 39 approximately 130,000 feet of medium voltage (34.5kV) underground cables. The collection lines will connect the turbines to each other and then to the Collector 40 41 My testimony focuses on the Timbermill Line, including the Collector Substation. 42 Substation and the Interconnection Switching station, as described in the CPCN and 43 **CECPCN** Applications.

44 The Collector Substation will be a single bus system with the following major 45 equipment:

46 1. One (1) 222 MVA, 230/34.5kV Main Power Transformer,

47 2. One (1) 230 kV, 1200 A SF6 Breaker,

48 3. Five (5) 34.5 kV,1200A Vacuum Breakers,

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- 49 4. Three (3) 180kV CCVTs,
- 50 5. Three (3) 180kV Arresters,
- 51 6. One (1) 230 kV Disconnector,
- 52 7. One (1) Cap Banks,
- 53 8. Various 34.5 kV Disconnectors, and
- 54 9. One (1) Control Enclosure.

55 The Timbermill Line between the Collector Substation and the Interconnection Switching 56 Station will be approximately 6 miles and will be 795 kcmil ACSR, Drake conductors 57 supported by steel and wood monopole transmission structures. Steel monopoles will be 58 utilized in locations where the Transmission Corridor is 75 feet wide and where guy 59 wires (which are required for wood transmission structures) will interfere with road 60 easements or farming equipment. H-frame transmission structures will be utilized in the 61 fenced area of the Collector Substation and Interconnection Switching Station. The transmission structures will be 75 to 120 feet in height and the minimum ground 62 63 clearance will be 25.4 feet.

- 64 The Interconnection Switching Station, owned by DENC, will have a 230kV ring 65 bus system with the following major equipment:
- 66 1. Three (3) 230 kV, 3000A SF6 Circuit Breakers,
- 67 2. Eight (8) 230 kV, 3000A Gang Operated Switches,
- 68 3. Nine (9) 180kV, Station Class Arresters,
- 69 4. Nine (9) 230kV CCVTs, and
- 5. One (1) Control Enclosure.

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71Q.WHAT ENGINEERING CONSIDERATIONS WERE TAKEN INTO72ACCOUNT DURING THE DESIGN OF THE TIMBERMILL LINE?

73 The Institute of Electrical and Electronics Engineers (IEEE) and the US Α. 74 Department of Agriculture Rural Utilities Service have published National Electrical 75 Safety Code and RUS Bulletin 1724E-20, which provides general transmission line 76 design criteria utilized in transmission line design around the country. This set of criteria 77 was utilized in the Timbermill Line design. The same set of criteria was used for weather 78 and structure loading and safety factors. For ground clearance, the Timbermill Line was 79 designed so as to allow the safe movement of agricultural equipment underneath the 80 Timbermill Line at its lowest sag point. With a clearance height of approximately 33 feet, 81 most agricultural equipment will be able to continue to operate under the Timbermill 82 Line.

Q. WILL THE TIMBERMILL LINE CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS?

A. Yes. All construction, operations and maintenance will be conducted in
accordance with applicable laws and regulations.

DOES THIS CONCLUDE YOUR TESTIMONY?

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A. Yes.

Q.