

BEFORE THE POWER SITING BOARD OF THE STATE OF OHIO

**In the Matter of the Application of 6011 Greenwich )  
Windpark, LLC for an Amendment to its Certificate to ) 15-1921-EL-BGA  
Install and Operate a Wind-Powered Electric Generation )  
Facility in Huron County, Ohio. )**

Members of the Board:

|   |                               |
|---|-------------------------------|
| Chairman, Public Utilities Commission     | Ohio House of Representatives |
| Director, Development Services Agency     | Ohio Senate                   |
| Director, Department of Health            |                               |
| Director, Department of Agriculture       |                               |
| Director, Environmental Protection Agency |                               |
| Director, Department of Natural Resources |                               |
| Public Member                             |                               |

To the Honorable Power Siting Board:

Please review the attached Staff Report of Investigation, which has been filed in accordance with Ohio Power Siting Board rules. The application in this case is subject to an approval process as required by Section 4906.03 of the Ohio Revised Code.

Sincerely,



Patrick Donlon  
Director, Rates and Analysis  
Public Utilities Commission of Ohio

## **OPSB STAFF REPORT OF INVESTIGATION**

**Case Number:** 15-1921-EL-BGA  
**Project Name:** Greenwich Windpark  
**Project Location:** Huron County  
**Applicant:** 6011 Greenwich Windpark, LLC  
**Application Filing Date:** November 16, 2015  
**Inspection Date:** December 18, 2015  
**Report Date:** April 22, 2016  
**Applicant's Waiver Requests:** none  
**Staff Assigned:** G. Zeto, M. Bellamy, A. Conway

### **Application Description**

On August 24, 2014, in case number 13-0990-EL-BGN, the Ohio Power Siting Board (Board) authorized 6011 Greenwich Windpark, LLC (Applicant) to construct a major utility facility, specifically a wind-powered electric generating facility consisting of up to 25 turbine sites with a combined generation capacity of 60 megawatts (MW).

On November 16, 2015, the Applicant filed the present application in case number 15-1921-EL-BGA, seeking to amend the certificate it received in case number 13-0990-EL-BGN. On March 22, 2016, the Applicant filed a supplement to its November 16, 2015 filing. Staff considered both the November 16, 2015 application and the March 22, 2016 supplement during its review of the application package. In the present application, the Applicant is proposing to add three turbine models for potential operation in this project: the Gamesa G114 (2.5 MW), the GE 2.5-120 (2.5 MW), and the GE 2.3-116 (2.3 MW). The overall project nameplate capacity of 60 MW approved in the original case would not change. Likewise, the locations of the project's associated facilities, including access roads, collector lines, substation, transmission line tie-in, concrete batch plant, and operation and maintenance facility remain unchanged.

### **Application Review**

Staff notes that the locations of the facility components would not change as a result of this request. The Applicant's present filing requests only the addition of three turbine models to the list of acceptable turbine models for this project. As such, Staff's review of the Applicant's request is solely focused on these three turbine models and whether adding them to the previously approved turbine model for this project would impact any of the stipulated conditions or result in a material increase in environmental impact as compared to the original project.

### *Additional Turbine Models*

The dimensions of the previously certificated Nordex N117 turbine model and the three proposed turbine models are detailed in the following table.

| <b>Turbine Model</b> | <b>Rotor Diameter</b> | <b>Total Height</b> |
|----------------------|-----------------------|---------------------|
| Nordex N117          | 383 feet              | 490.5 feet          |
| Gamesa G114          | 373 feet              | 492 feet            |
| GE 2.5-120           | 394 feet              | 476 feet            |
| GE 2.3-116           | 380 feet              | 498 feet            |

Applicable to the original certificate in case number 13-0990-EL-BGN, 1,125 feet in horizontal distance from the tip of the turbine's nearest blade at 90 degrees to the exterior of the nearest, habitable, residential structure is the minimum distance a turbine is authorized to be located in proximity to a habitable structure on an adjacent property, without appropriate waiver. Likewise, applicable to the original certificate, the property line setback is equal to a horizontal distance, from the turbine's base to the property line of the wind farm property, equal to one and one-tenth times the total height of the turbine structure as measured from its base to the tip of its highest blade.

The turbine blade length of the turbine model approved in the original application led to a minimum residential setback calculation of 1,312 feet from the turbine base to the exterior of the nearest habitable residential structure. Using the maximum turbine blade length of the three turbine models proposed by this amendment (i.e. the blade length of the GE 2.5-120 turbine model) and the minimum setback requirement applied in the original case, the residential setback requirement would be 1,322 feet from the turbine base to the exterior of the nearest habitable residential structure.

Using the turbine height of the turbine model approved in the original application, the minimum property line setback would be 540 feet from the turbine base to the property line of the wind farm. Using the turbine height of the tallest of the three turbine models proposed in this filing, the minimum setback requirement applied in the original case would be 548 feet from the turbine base to the property line of the wind farm.

The originally approved project included 16 turbine sites that were within the minimum setback from the property line of the wind farm property and one turbine site that was within the minimum setback from the exterior of the nearest, habitable, residential structure. In the original case, the Board required executed waivers of the minimum setback for each of these turbine sites. The same turbine sites that originally required a waiver of the setback continue to require a waiver of the setback. When applying the original setback, the increased turbine height does not require additional waivers of the setback for the remaining turbine sites, as the remaining turbine sites were sited far enough away from the wind farm property line and the exteriors of the nearest, habitable residential structures to comply with this setback, even when the setback distance is calculated using the height of the tallest proposed turbine model.

With regard to compliance with the required minimum setback distances for each turbine, Staff finds that the addition of the three proposed turbine models does not create the need for any additional stipulated conditions or result in a material increase in environmental impact when compared to the original project. Consistent with the originally approved project, if the location of a wind turbine does not meet the applicable setback, it may not be constructed unless the Applicant secures appropriate executed waiver(s) of the minimum setback requirement.

### *Safety Manuals*

Staff reviewed the safety manuals for the proposed turbine models. Staff finds that the conditions of the original certificate adequately address safety considerations. Staff also finds that the addition of the proposed turbine models does not result in a material increase in environmental impact when compared to the original project.

### *Turbine Noise*

In the present application, the Applicant committed to adhering to the noise condition specified in the Board's Opinion and Order for the original certificate in case number 13-0990-EL-BGN, Condition 15, specifically:

The facility shall be operated so that the facility noise contribution does not exceed the project area ambient nighttime  $L_{EQ}$  (46 dBA) by five dBA result at the exterior of any currently existing nonparticipating sensitive receptor. During daytime operation, from 7:00 a.m. to 10:00 p.m., the facility may operate at the greater of: the project area ambient nighttime  $L_{EQ}$  (46 dBA) plus five dBA; or the validly measured ambient  $L_{EQ}$  plus five dBA at the location of the sensitive receptor. After commencement of commercial operation, the Applicant shall conduct further review of the impact and possible mitigation of all facility-related noise complaints through its complaint resolution process.

The Applicant conducted a noise study to model the noise impact of the three proposed turbine models. The modeled impact of the proposed turbine models was compared to the ambient noise level presented in the original application, specifically 46 A-weighted decibels (dBA). The noise study shows that the modeled impact would be less than the nighttime ambient plus five dBA, or 51 dBA, for all nonparticipating receptors for all three proposed turbine models.

Staff additionally reviewed the impact of the previously certificated and proposed turbine models on nonparticipant receptors for impacts ranging between 46 dBA and 51 dBA. Neither the previously certificated Nordex N117 nor the proposed GE 2.5-210 turbine models impact any nonparticipating receptors above 46 dBA. However, one of the proposed turbine models, the Gamesa G114, was modeled to have an impact on one nonparticipating receptor above 46 dBA but below 51 dBA.

With regard to the potential noise impact of the three proposed turbine models, Staff finds that the addition of the three proposed turbine models does not create the need for any additional stipulated conditions or result in a material increase in environmental impact when compared to the previously certificated turbine model.

### *Shadow Flicker*

The Applicant's original application in case number 13-0990-EL-BGN was approved with a condition limiting shadow flicker, Condition 16, which states:

The facility shall be operated so that the turbine shadow flicker does not exceed 30 hours per year for any nonparticipating sensitive receptor. Applicant shall confirm with Staff that the minimization measure or mitigation has been completed for the two receptors that the model and site specific analysis showed to be in excess of 30 hours per year of shadow flicker. The analysis shall show how modeled shadow flicker impacts have been reduced to 30 or fewer hours per year for each such receptor. The analysis shall be provided to Staff at least 30 days prior to the preconstruction conference, for review and confirmation that it complies with this condition. This analysis may incorporate shadow flicker reductions from trees, vegetation, buildings, obstructions, turbine line of sight, operational hours, wind direction, sunshine probabilities, and other mitigation confirmed by Staff to be in compliance with this condition. After commencement of commercial operation, Applicant shall conduct further review of the impact and possible mitigation of all facility related shadow flicker complaints through its complaint resolution process.

The Applicant modeled the shadow flicker impact of the previously certificated turbine model and the three proposed turbine models. The previously certificated Nordex N117 turbine model was projected to impact two nonparticipating receptors with shadow flicker in excess of 30 hours per year. The proposed Gamesa G114 and the GE 2.3-116 turbine models are each projected to impact five nonparticipating receptors with shadow flicker in excess of 30 hours per year, while the proposed GE 2.5-120 turbine model is projected to impact six nonparticipating receptors with shadow flicker in excess of 30 hours per year.

The condition of the original certificate explicitly applies to two specific nonparticipating receptors, but the currently proposed turbine models would increase the nonparticipating receptors that could receive more than 30 hours of shadow flicker per year. Therefore, Staff recommends that the original condition be updated to apply to any nonparticipating receptors forecasted to exceed 30 hours of shadow flicker per year. The Applicant has committed to adhering to the original shadow flicker condition for any turbine forecasted to create in excess of 30 hours per year of shadow flicker at a nonparticipating receptor within the study area.

With regard to the potential impact of shadow flicker from the three proposed turbine models, Staff finds that upon application of Condition 16 in case number 13-0990-EL-BGN to all applicable receptors, the addition of the three proposed turbine models does not result in a material increase in environmental impact when compared to the original project.

### *Ice Throw*

Staff evaluated the potential for ice throw for the proposed turbine models as compared to the previously certificated turbine model. Both the previously certificated and proposed turbine models incorporate ice detection equipment and safety features that would shut down a turbine if the buildup of ice would cause excess vibrations or the speed to power ratio to become too high.

Additionally, the Applicant conducted an ice throw study on the GE 2.3-116 turbine model, which is the tallest of the proposed turbine models. Staff evaluated and compared the Applicant's ice throw study for the GE 2.3-116 turbine model to the ice throw study for the previously certificated Nordex N117 turbine model. Both studies yielded similar probabilities for ice throw.

Staff found that the addition of the proposed turbine models does not create the need for any additional stipulated conditions and does not result in a material increase in environmental impact when compared to the original project.

#### *Blade Shear*

Staff evaluated the potential for blade shear for the proposed turbine models as compared to the previously certificated turbine model. Both the previously certificated and proposed turbine models have multiple safety features to address blade shear, including two fully independent braking systems, a pitch control system, and turbine shut-offs in the event of excessive wind speeds, excessive blade vibration, or stress.

Additionally, the Applicant analyzed the potential impact for blade shear of the previously certificated and proposed turbine models. Staff evaluated and compared the Applicant's analyses and determined there to be negligible potential impact due to blade shear for either the previously certificated or proposed turbine models.

Therefore, in terms of potential blade shear, Staff finds that the addition of the three proposed turbine models does not create the need for any additional stipulated conditions and does not result in a material increase in environmental impact when compared to the original project.

#### *Pipeline Protection*

In the time since the original certificate was issued in case number 13-0990-EL-BGN, Kinder Morgan has proposed a pipeline for the area. Kinder Morgan estimates that construction will begin in November 2016 and that the pipeline will be placed in service in January 2018. The Applicant has met with Kinder Morgan and asserts that the distance of the pipeline to the base of any turbine would be greater than 1.1 times the total turbine height, which is 548 feet for the tallest turbine model. The Applicant has continued to keep in contact with the Kinder Morgan as the projects have progressed. Staff finds that Conditions 9, 10, 18, and 31 from the certificate issued in case number 13-0990-EL-BGN adequately address pipeline protection issues.

### **Conclusion**

Staff's review of the Applicant's request regarding the three proposed turbine models focuses solely on the potential impacts associated with the turbine models and whether the proposed turbine models impact any of the stipulated conditions or result in a material increase in environmental impact when compared to the original project. The proposed addition of three turbine models to the list of authorized turbine models would not require a change in location of any turbine sites or non-turbine associated facilities. Staff finds, if any of the three proposed turbine models were selected, the original conditions of the certificate, in concert with the clarification made to Condition 16, are adequate to ensure that adverse environmental impacts would continue to be minimized for this project.

## **Recommended Findings**

Staff recommends that the Board approve the application related to the three proposed wind turbine models, provided that the certificate continues to include the 53 conditions specified in the Opinion, Order, and Certificate for case number 13-0990-EL-BGN, including the Applicant's compliance with the applicable statutory setback requirements and subject to the conditions of this staff report.

## **Recommended Conditions**

1. The Applicant shall continue to adhere to all conditions of the Opinion, Order, and Certificate for the Greenwich Wind Farm Project in case number 13-0990-EL-BGN, and as modified by this amendment, with the Gamesa G114, GE 2.5-120, and the GE 2.3-116 turbine models to be added as acceptable turbine models.
2. The Applicant shall apply Condition 16 of the Opinion, Order, and Certificate for the Greenwich Wind Farm Project in case number 13-0990-EL-BGN to all receptors that the model and site specific analysis showed to be in excess of 30 hours per year of shadow flicker.

**This foregoing document was electronically filed with the Public Utilities**

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**Case No(s). 15-1921-EL-BGA**

Summary: Staff Report of Investigation electronically filed by Mrs. Yvonne W Cooper on behalf of Staff of OPSB