



NORTH CAROLINA WIND WORKING GROUP

MODEL WIND ORDINANCE FOR WIND ENERGY FACILITIES IN NORTH CAROLINA

JULY 2008

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In January 2008, the Coastal Wind Working Group and the Western Wind Working Group merged to form the North Carolina Wind Working Group. The goals of this group are:

- Develop a clear understanding of existing attitudes on wind development
- Educate the public and key stakeholders, and address their issues
- Generate interest leading to responsible wind development.

One of the first tasks of the group was to develop a model wind ordinance to inform communities considering wind energy development. The ordinance was developed in a collaborative effort that included federal and state agencies, wind industry professionals, non-profit organizations, and other stakeholders interested in responsible wind energy development.

MODEL WIND ORDINANCE – IMPORTANT NOTES

The *Model Wind Ordinance for Wind Energy Facilities in North Carolina* is intended to provide assistance to communities designing a local wind ordinance. The North Carolina Wind Working Group encourages each community to modify the model ordinance to meet their needs. However, it is important to note that the setbacks are minimum requirements, designed to protect public safety and mitigate the impacts of noise and shadow flicker. By addressing these concerns through minimum setback requirements, the model wind ordinance omits lot size requirements and height restrictions – which can be found in several North Carolina ordinances.

While North Carolina's primary wind resources are located in mountain and coastal counties, the model ordinance does not consider or account for regional variations – such as hurricanes. Therefore, the Wind Working Group encourages communities to consider important local factors when crafting a wind ordinance. Finally, communities should also understand that the adoption of a local wind ordinance will not preclude a wind energy facility from the requirements of applicable state and federal regulations.

FOR ADDITIONAL INFORMATION

Existing North Carolina ordinances pertaining to wind energy can be found at the NC Solar Center's Database of State Incentives for Renewables and Efficiency: <http://www.dsireusa.org>.

The ASU Energy Center also provides a sample of ordinances from other states in the Wind Ordinance Matrix on their website: <http://www.wind.appstate.edu/research/permitting.php>.

Questions about wind energy development or the model wind ordinance can be directed to:

Steve Kalland, NC Solar Center: (919) 515-5666 or steve_kalland@ncsu.edu
Bob Leker, NC State Energy Office: (919) 733-1907 or bob.leker@ncmail.net
Paul Quinlan, NC Sustainable Energy Association: (919) 832-7601 or paul@energync.org
Dennis Scanlin, ASU Energy Center: (828) 262-6361 or scanlindm@appstate.edu

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1. TITLE

This ordinance shall be known as the Wind Energy Facility Ordinance for _____ [*county or municipality*]

2. PURPOSE

The purpose of the Ordinance is to provide for the regulation of the construction and operation of Wind Energy Facilities in _____ [*county or municipality*], subject to reasonable conditions that will protect the environment, public health, safety, and welfare.

3. DEFINITIONS

- A. "Applicant" is the person or entity filing an application under this Ordinance.
- B. "Environmental Assessment" is a detailed examination of the applicant's proposal and its local environmental context with an emphasis on avoiding, minimizing, and mitigating adverse impacts.
- C. "Facility Operator" is the entity responsible for the day-to-day operation and maintenance of the Wind Energy Facility.
- D. "Facility Owner" is the entity or entities having controlling or majority equity interest in the Wind Energy Facility, including their respective successors and assigns.
- E. "Non-Participating Landowner" is any landowner not under agreement with the Facility Owner or Operator.
- F. "Occupied Building" is a residence, school, hospital, church, public library or other buildings used for public gathering that is occupied or in use when the permit application is submitted.
- G. "Participating Landowner" is a landowner under lease or other property agreements with the Facility Owner or Operator pertaining to the Wind Energy Facility.
- H. "Public Road" is a full passage right-of-way.

- I. "Shadow Flicker" is the visible flicker effect when rotating turbine blades cast shadows on the ground and nearby structures causing the repeating pattern of light and shadow.
- J. "Wind Energy Facility" is an electric generating facility, whose main purpose is to supply electricity, consisting of one or more Wind Turbines and other accessory structures and buildings, including substations, meteorological towers, electrical infrastructure, transmission lines and other appurtenant structures & facilities. For the purpose of this ordinance, the term does not apply to roof-mounted or building integrated roof mounting systems.
- K. "Wind Energy Facility, Small" is a single system designed to supplement other electricity sources as an accessory use to existing buildings or facilities, wherein the power generated is used primarily for on-site consumption. A small wind energy conversion system consists of a single wind turbine, a tower, and associated control or conversion electronics, which has a total rated capacity of 20 kW or less.
- L. "Wind Energy Facility, Medium" is a wind energy conversion system consisting of one or more wind turbine(s), a tower(s), and associated control or conversion electronics, which has a total rated capacity of more than 20 kW but not greater than 100 kW.
- M. "Wind Energy Facility, Large" is a wind energy conversion system consisting of one or more wind turbine(s), a tower(s), and associated control or conversion electronics, which has a total rated capacity of more than 100 kW.
- N. "Wind Power" is the conversion of wind energy into another form of energy.
- O. "Wind Turbine" or windmill is a wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator, and may include a nacelle, rotor, tower, guy wires and pad transformer.
- P. "Wind Turbine Height" is the distance measured from grade at the center of the tower to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation.

4. PERMIT REQUIREMENT

- A. No Wind Energy Facility, or addition of a Wind Turbine to an existing Wind Energy Facility, shall be constructed unless a permit has been issued to the Facility Owner or Operator approving construction of the facility under this Ordinance. Permit application of the expansion shall be based on the total rated capacity, including existing facility but excluding like-kind replacements.
- B. Any physical modification to an existing and permitted Wind Energy Facility that materially alters the size and/or type of Wind Turbines or other equipment shall require a permit modification under this Ordinance. Like-kind replacements shall not require a permit modification.

5. PERMITTED USE

Wind Energy Facility	Zoning Districts			
	Agricultural	Residential	Commercial	Industrial/ Manufacturing
Small	P	P	P	P
Medium	P	S	S	P
Large	S	S	S	S

P – Permitted Use; Building Permit Required
 S – Special Use Permit Required

6. PERMIT APPLICATION

- A. The permit application shall contain the following:
- i. A narrative describing the proposed Wind Energy Facility, including an overview of the project;
 - ii. The proposed total rated capacity of the Wind Energy Facility;
 - iii. The proposed number, representative types and height or range of heights of wind turbines to be constructed; including their generating capacity, dimensions and respective manufacturers, and a description of ancillary facilities;
 - iv. Identification and location of the properties on which the proposed Wind Energy Facility will be located;
 - v. A site plan showing the planned location of all wind turbines, property lines, setback lines, access roads and turnout locations, substation(s), electrical cabling from the Wind Energy Facility to the substation(s), ancillary equipment, building(s), transmission and distribution lines. The site plan must also include the location of all structures and properties, demonstrating compliance of the setbacks;
 - vi. Certification of compliance with applicable local, state and Federal regulations, such as FAA and FCC regulations.
 - vii. An Environmental Assessment for Large Wind Energy Facilities, which shall be provided for review by the applicant to the agency point of contact and to the state clearinghouse for distribution. The applicant must also present a certification of distribution of the Environmental Assessment;

- viii. Other relevant information as may be reasonably requested by _____ [county or municipality] to ensure compliance with the requirements of this Ordinance.
- ix. Decommissioning plans that describe the anticipated life of the wind power project, the estimated decommissioning costs in current dollars, the method for ensuring that funds will be available for decommissioning and restoration, and the anticipated manner in which the wind power project will be decommissioned and the site restored;
- x. Documentation of agreement between Participating Landowner(s) and the Facility Owner/Operator of the Wind Energy Facility; and
- xi. Signature of the Applicant.

- B. Throughout the permit process, the Applicant shall promptly notify _____ [county or municipality] of any proposed changes to the information contained in the permit application that would alter the impact of the project.
- C. Changes to the approved application that do not materially alter the initial site plan may be adopted administratively.

7. SETBACKS

Wind Energy Facility Type	Minimum Setback Requirements ¹			
	Occupied Buildings on Participating Landowner Property	Occupied Buildings on Non-Participating Landowner Property	Property Lines on Non-Participating Landowner Property	Public Roads
Small System	0.0	1.5	1.1	1.5
Medium System	1.1	2.0	1.5	1.5
Large Scale	1.1	2.5	1.5	1.5

1. The setback is calculated by multiplying the required setback number by the Wind Turbine Height and measured from the center of the wind turbine base to the property line, Public Road, or nearest point on the foundation of an Occupied Building.

- A. Setbacks provisions may be waived if the following conditions are met:
 - i. Property owners may waive the setback requirements for Property Lines and/or Occupied Buildings on the Participating Landowner property and/or Non-Participating Landowner

property by signing a waiver that sets forth the applicable setback provision(s) and the proposed changes.

- ii. The written waiver shall notify applicable property owner(s) of the setback required by this Ordinance, describe how the Wind Energy Facility is not in compliance, and state that consent is granted for the Wind Energy Facility to waive the setback as required by this Ordinance.
- iii. Any such waiver shall be signed by the applicant, the Participating Land Owner(s) and/or Non-Participating Landowner(s), and recorded in the Deeds Office where the property is located.

8. NOISE AND SHADOW FLICKER

This section shall only apply to Large Wind Energy Facilities. Noise and shadow flicker issues for Small and Medium Wind Energy Facilities are addressed by setbacks, or will be addressed by an existing noise ordinance.

- A. Audible sound from a Large Wind Energy Facility shall not exceed fifty-five (55) dBA, as measured at any Occupied Building of a Non-Participating Landowner.
- B. Shadow flicker at any Occupied Building on a Non-Participating Landowner's property caused by a Large Wind Energy Facility located within 2,500 ft of the Occupied Building shall not exceed thirty (30) hours per year.
- C. Noise and/or shadow flicker provisions may be waived if the following conditions are met:
 - i. Property owners may waive the noise and/or shadow flicker provisions of this Ordinance by signing a waiver of their rights.
 - ii. The written waiver shall notify applicable property owner(s) of the noise and/or flicker limits required by this Ordinance, describe how the Wind Energy Facility is not in compliance, and state that consent is granted for the Wind Energy Facility to waive noise and/or flicker limits as required by this Ordinance.
 - iii. Any such waiver shall be signed by the applicant and the Non-Participating Landowner(s), and recorded in the Deeds Office where the property is located.

9. INSTALLATION AND DESIGN

- A. The installation and design of the Wind Energy Facility shall conform to applicable industry standards, including those of the American National Standards Institute, and take into consideration local conditions.

- B. All structural, electrical and mechanical components of the Wind Energy Facility shall conform to relevant and applicable local, state and national codes.
- C. Any on-site collector system shall, to the maximum extent possible, be placed underground.
- D. The visual appearance of Wind Energy Facilities shall at a minimum:
 - i. Be a non-obtrusive color such as white, off-white or gray;
 - ii. Not be artificially lighted, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety; and,
 - iii. Not display advertising (including flags, streamers or decorative items), except for identification of the turbine manufacturer, facility owner and operator.

10. DECOMMISSIONING

- A. The Wind Energy Facility Owner shall have 6 months to complete decommissioning of the Facility if no electricity is generated for a continuous period of 12 months.
- B. Decommissioning shall include removal of wind turbines, buildings, cabling, electrical components, roads, and any other associated facilities down to 36 inches below grade.
- C. Disturbed earth shall be graded and re-seeded, unless the landowner requests in writing that the access roads or other land surface areas not be restored.