

Model Ordinance

Residential-Scale Wind Energy Projects

January 2, 2013

Guidelines and Options for the Commonwealth of Virginia

Background

This model ordinance was originally drafted by Dr. Maria Papadakis of James Madison University in the fall of 2011 as part of the work of the Department of Environmental Quality's (DEQ's) Local Government Outreach Group (LOG).¹ Subsequent revisions were made under the auspices of the Wind Technical Group and the LOG.

This model ordinance draws on (a) the draft model ordinance of the Virginia Association of Counties (VACO), (b) wind ordinances from Pulaski, Roanoke, Rockbridge, Rockingham, and Shenandoah Counties, and (c) the wind ordinance for the City of Suffolk. The version presented here reflects the compilation of provisions suggested by Dr. Papadakis and LOG members for consideration by local governments when they determine how residential-scale wind energy projects should be located in their jurisdictions. To the extent practicable, explanatory comments and issues of concern are noted in footnotes. The use of **[brackets]** around certain provisions (1) indicates points at which a local government should supply locality-specific information or (2) signals a decision point at which a local government may adopt the suggested provision and/or may wish to give special consideration to local circumstances and preferences in framing the provision.

When utilizing this Model Ordinance, please also refer to the document, "Introduction: DEQ's Local Government Outreach for Renewable Energy," which can be found at:

<http://www.deq.virginia.gov/Programs/RenewableEnergy/LocalGovernmentOutreach.aspx> .

Commentary: Many wind turbines for on-site/net-metering use are quite small. They are neither big nor imposing in the landscape, they do not require extreme heights to operate efficiently, they are generally not noisy, and they are generally considered to have negligible-to-no environmental impacts. In addition, many localities in Virginia do not have a strong wind resource, and the only wind turbines that can readily be powered in their area are the smaller turbines. For this particular class of machines and type of land use, a streamlined permitting process may be desirable. This model ordinance is therefore written for the smallest tier of wind turbines—what we are calling *micro turbines*—and their rated capacity is 10 kW and less. This model ordinance provides language for permitting micro wind turbines as an accessory use by right, but it can be modified to a special use permit process by localities if that is what they choose to do. The model also includes a menu of ordinance options for localities to select from depending on their overall regulatory strategy (for example, varying lot size or height restrictions by zoning district). Although we are employing the commonly-used rubric, "Residential-Scale," micro turbines may be found in residential, commercial, and other zoning districts.

Note: **State law requires that wind ordinances include provisions regarding noise, setbacks, and decommissioning.** (See Code of Virginia §67-103)

¹ The LOG is an informal group of stakeholders, chaired by DEQ's Director, with representation from local governments, developers, academia, and environmental organizations. Its work is facilitated by DEQ staff. The Wind Technical Group is a subset of stakeholders who reviewed and discussed the draft prior to final LOG action.

Model Ordinance

1. Purpose and Intent

The purpose of the Ordinance is to provide for the construction, operation, and decommissioning of micro wind turbines subject to reasonable conditions that will promote and protect the public health, safety, and welfare, while encouraging renewable energy development within [locality].²

2. Definitions

Building-Mounted: A micro wind turbine that is physically installed on a building, such as a rooftop.

Micro Wind Turbine: A single wind turbine with a rated capacity of [10 kW] or less, designed to supplement other electricity sources as an accessory use to existing buildings or facilities, wherein the electric power generated is used primarily for on-site consumption. A micro wind turbine consists of a single turbine and associated control and/or conversion electronics, and may be building-mounted (such as on a rooftop) or mounted on a tower.

Rated Capacity: The rated output of electric power production equipment specified by the manufacturer, also referred to as “nameplate capacity.”

Tower: A structure installed on the ground and on which the micro wind turbine is mounted.

Micro Wind Turbine Height: The distance measured from grade to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation.

3. Applicability

The requirements set forth in this section shall govern the siting of micro wind turbines used to generate electricity or perform work which may be connected to the utility grid pursuant to the Virginia's net metering laws (Code of Virginia § 56-594) or serve as an independent source of energy.

Optional additional language:

This Ordinance applies to all micro wind turbines proposed to be constructed after the effective date of this Ordinance. Small wind turbines constructed prior to the effective date of this Ordinance shall not be required to meet the requirements of this Ordinance.

4. Permitted Use

Micro wind turbines shall be considered an accessory use and be permitted by right in all zoning classifications subject to the requirements as set forth in this Ordinance.³

² The Code of Virginia §67-103 requires that local wind ordinances be consistent with the Commonwealth's Energy Policy, which calls for encouragement of renewable energy.

³ Localities that want to authorize micro wind turbines pursuant to a special use permit should insert their standard language here. The rest of the suggested ordinance language could stay largely the same. Note: If a property owner wishes to install more than one micro turbine on his parcel, the locality may wish to consider requiring a special use permit.

5. Application Procedures

A. Zoning Permit

A zoning permit approved by the Zoning Administrator shall be required for the installation of a micro wind turbine. The applicant shall provide the following information with the zoning permit application:

1. A plat that illustrates:

- (i) Property lines, physical dimensions, and acreage of the property
- (ii) Location, dimensions, and types of existing structures on the property
- (iii) Location of the proposed micro wind turbine and tower
- (iv) The right-of-way of any public and private road that is contiguous with or crossing the property
- (v) Any overhead utility lines

2. The micro wind turbine specifications, including manufacturer and model, rated capacity, rotor diameter, tower height, and overall micro wind turbine height.

3. The proposed color of the wind energy system.

4. Evidence that the electric utility service provider to the site has been informed of the applicant's intent to install an interconnected customer-owned electricity generator, unless the applicant intends, and so states on the application, that the system will not be connected to the electricity grid. This notification will take place by having the electric utility provider sign the permit application. This signature does not construe approval for net metering by the electric utility.

6. Proof of adequate liability insurance for a micro wind turbine. Whether or not the applicant is participating in the net metering program, the applicant will be required to meet the insurance coverage requirements set forth in 20 VAC 5-315-60.

7. Evidence that the proposed height of the small wind turbine tower does not exceed the height recommended by the manufacturer or distributor of the system.

8. Evidence that the installation of the micro wind turbine avoids the emission of radio and television signals and that the micro wind turbine complies with the provisions of Section 47 of the Federal Code of Regulations, Part 15 and subsequent revisions governing said emissions.

B. Procedure

- (i) An owner shall submit an application to the Zoning Administrator for a zoning permit for a micro wind turbine.⁴
- (ii) The Zoning Administrator shall issue a permit or deny the application within one month of the date on which the complete application is received.

⁴ It is recommended that micro wind turbines be permitted by right. If, however, localities want to allow micro wind turbines as a special use permit, they will need to modify this section to reflect their special use permit procedures.

- (iii) The Zoning Administrator shall issue a zoning permit for a micro wind turbine if the application materials show that the proposed installation meets the requirements of this ordinance.
- (iv) If the application is denied, then the Zoning Administrator shall notify the applicant in writing and provide a written statement of the reasons why the application was denied.
- (v) If the application is denied, the applicant may appeal this decision to the Board of Zoning Appeals.

C. Expiration

A zoning permit issued pursuant to subsection B of this section shall expire if:

- (i) The micro wind turbine is not installed and functioning within **[24 months]** from the date the permit is issued; or,
- (ii) The micro wind turbine is out of service or otherwise unused for a continuous **[24-month]** period.

6. Siting Requirements

The requirements for siting and installation of all micro wind turbines regulated by this Ordinance shall include the following:

A. Visual Appearance

1. Micro wind turbine towers shall maintain a galvanized steel finish, or if the owner is attempting to conform the tower to the surrounding environment and architecture, the tower may be painted to reduce visual obtrusiveness subject to the approval of the Zoning Administrator.
2. Micro wind turbines, towers, and building-mounted structures shall not be artificially lighted.
3. No micro wind turbine, tower, or building-mounted structure should have any sign, writing, or picture that may be construed as advertising.

B. Noise

Micro wind turbines shall not exceed **[55]** decibels⁵, as measured at the closest property line. The level, however, may be exceeded during short-term events such as severe weather events.

Or,

Micro wind turbines shall comply with the noise requirements of the zoning district; however, these limits may be exceeded during short-term events such as severe weather events.

C. Lot Size

There is no minimum lot size required by this Ordinance for the installation of a micro wind turbine, provided that the setback requirements are met.

Or,

A small wind turbine shall be located on a parcel that, at minimum, is **[one (1) acre]** in size.⁶

⁵ Two common noise limits in Virginia wind ordinances are 55 and 60 decibels.

⁶ Common minimum parcel sizes specified in Virginia small wind ordinances are 1, 2, and 5 acres.

Or,

**Zoning District Regulations:
Minimum Lot Size for A Micro Wind Turbine**

		Zoning District			
		W	X	Y	Z
Minimum Lot Size					

D. Setbacks

1. Micro wind turbines installed on a rooftop or as a building-integrated device are not subject to the setback provisions in this Ordinance, but are subject to the setback requirements for the underlying zoning district.⁷
2. The micro wind turbine, if installed on a tower, shall be set back a distance at least equal to one hundred ten (110) percent of the micro wind turbine height from all adjacent property lines, and a distance at least equal to one hundred fifty (150) percent of the wind turbine height from any dwelling inhabited by humans on neighboring property. These setbacks may be reduced by notarized consent of the owner of the property on which the requested wind energy system is to be erected and the adjacent landowner whose property line or dwelling falls within the specified distance.
3. The micro wind turbine, if installed on a tower, shall be set back a distance at least equal to one hundred fifty (150) percent of the wind turbine height from public roads and rail easements.
4. The setback shall be measured from the edge of the micro wind turbine tower base to the property line, Public Road/Right-of-Way, or rail easement.

E. Height⁸

1. The micro wind turbine, if installed on a roof or as a building-integrated device, may project no more than **[15 feet]** above the highest point on the structure and shall comply with the height requirement of the zoning district.
2. The micro wind turbine, if installed on a tower, shall comply with the height requirement of the zoning district.

Or,

The micro wind turbine, if installed on a tower, shall not exceed a maximum height of **[120 feet]**.

Or,

**Zoning District Regulations:
Maximum Micro Wind Turbine Height**

		Zoning District			
		W	X	Y	Z
Maximum Micro					

⁷ Several LOG members noted that there may be various problems with rooftop installation of wind turbines, including underperformance, damage to the roof structure, vibrations, and other potential safety concerns. See, for example, cautionary comments in NREL article at <http://www.nrel.gov/docs/fy11osti/50172.pdf>.

⁸ The height of the turbine matters a great deal to the overall efficiency of the equipment and its economic rate-of-return. Localities are urged not to be overly restrictive regarding height restrictions. Height limits for small wind turbines in Virginia wind ordinances range up to approximately 120 feet.

Wind Turbine Height				
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[F. Shadow Flicker – no provision recommended]⁹

6. Federal and State Requirements

Compliance with Uniform Statewide Building Code: Building permit applications for micro wind turbines shall be accompanied by standard drawings of the wind turbine structure, including the tower, base, and footings, or in the case of a building-integrated micro wind turbine, its mounting structure. An engineering analysis of the tower (or mounting structure, as applicable) showing compliance with the Uniform Statewide Building Code and certified by a licensed professional engineer shall also be submitted.¹⁰

Compliance with National Electric Code: Building permit applications for micro wind turbines shall be accompanied by documentation in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code.

Compliance with Regulations Governing Energy Net Metering: Micro wind turbines connected to the utility grid must comply with 20 VAC 5-315: Regulations Governing Net Energy Metering.

7. Decommissioning: Removal of Defective or Abandoned Micro Wind Turbines

Any micro wind turbine found to be unsafe [**by the building official**] shall be repaired by the owner to meet federal, state and local safety standards or removed within [**six months**]. Any micro wind turbine that is not operated for a continuous period of [**24 months**]¹¹ shall be considered abandoned, and the owner of the system shall re-

⁹ “Shadow flicker” means the visible effect that occurs when rotating turbine blades cast shadows on the ground and nearby structures causing a repeating pattern of light and shadow. Shadow flicker is often a concern with community-scale and utility-scale wind projects, but appears rarely to be a problem in residential-scale turbines. For this reason, or because shadow flicker concerns are largely mitigated by setback requirements, the majority of localities do not include a shadow flicker provision. (For instance, the Charlestown, WV, Planning Commission described shadow flicker as “seasonal, brief, and less of a problem with residential sized turbines.” See the proposed Charlestown Ordinance and its rationale at <http://charlestowncitizens.org/cca/2011/11/10/residential-wind>. See also The North Carolina Wind Working Group Model Ordinance at <http://www.dsireusa.org/incentives/index.cfm?re=0&ee=0&spv=0&st=0&srp=1&state=NC> and the model adopted by state of New York at http://www.nyserda.ny.gov/~media/Files/EERP/Renewables/Model_Small-Scale_Wind_Zoning_Ordinance.ashx?sc_database=web.) The Guidance for the Georgia Model Ordinance (accessible at http://www.gawwg.org/images/F-GA_Model_Wind_Ordinance_Guidebook_for_Local_Governments_1-11-11.pdf) similarly notes that the effect is “almost nonexistent with small wind turbines, which probably will not spin slowly enough to cause significant shadow flicker.”

¹⁰ **Safety and Construction.** Some LOG members recommended that localities also consult information about certification of turbines at distributedwind.org and <http://distributedwind.org/assets/docs/PandZDocs/dwea-model-zoning-ordinance-passed-01-07-12.pdf> (new version in development), and also <http://www.smallwindcertification.org/>.

¹¹ Existing wind ordinances in Virginia typically use 12 or 24 months as the period regarding abandonment. Unless the locality believes the abandoned micro turbine presents a safety problem, it could be within the locality’s discretion whether to actually issue a notice requiring removal of the turbine and tower. As explained on DEQ’s website, Virginia’s codified Energy Policy requires local and state governments to encourage renewable energy;

move the turbine within **[90 days]** of receipt of notice from the locality instructing the owner to remove the abandoned small wind turbine and tower.

therefore, it is suggested that localities avoid making stricter requirements for renewable energy projects - regarding abandonment and otherwise - than they do for other types of structures.
