

**The Regulation and Management of Wind-Energy  
Devices,**

*A Report to the Planning & Zoning Commission of  
Allegany County*

**January 2009**

In 2002, at the recommendation of staff, the Planning & Zoning Commission and the County Commissioners amended the Allegany County Zoning Code to provide for the regulation of wind energy conversion systems. Prior to that time, Allegany County – like the preponderance of local governments nationwide – had no regulatory protocols in place to manage these unique land uses.

The 2002 Code amendments established a definition for “Wind Energy Conversion Systems” (WECS), “Wind Farm”, and “Wind Turbine”. The modifications also made WECS a permitted use in the ‘A’ (Agriculture) and ‘C’ (Conservation) Districts. Finally, the 2002 modifications established buffer and setback distances and established the means by which WECS heights were to be determined.

The buffers that were established called for the structures to be located a distance of two times the structure’s height from the nearest occupied structure on an adjacent lot. It further provided for this distance to be reduced to a distance equal to the structure’s height if the owner of the adjacent property consented (via the presentation of a written waiver). Minimum setbacks were also established. Setback requirements mandated a minimum lot line setback of a distance equal to the height of the structure. Finally, the 2002 amendments stipulated that the structures’ height was to be determined by measuring the vertical distance from grade to nacelle.

Prior to 2002, there was no real need to include regulatory provisions in the Zoning Code. Unlike today, the idea of Wind Farms and Wind Energy was somewhat futuristic and not something that most people saw as part of their immediate landscape future. At the time of their adoption, Allegany County’s zoning provisions were probably considered progressive.

In the intervening time period, wind turbines have become an increasingly common part of this nation’s landscape. As consistent winds of sufficient velocity and large open areas are necessary to facilitate cost-effective operation, the preponderance of these devices have been located in the Great Plains region and offshore locations. In Europe, significant numbers of wind devices have been constructed in offshore locations. In United States, the most popular locations to date have been the area from Texas to the Canadian Border and various water-based sites, with ridge top locations a distant third. Many states and local jurisdictions are devoting increasing attention to the investigation of offshore locations. These are seen as ideal locations, because there are no land cover alterations necessary and their proximity to population centers are sufficiently remote, thus minimizing negative viewshed impacts.

Recently, neighboring Delaware opted to permit the location of wind farms in offshore Atlantic locations. In Maryland, the most favorable winds can be found on the Chesapeake Bay and the Atlantic Ocean (offshore Worcester County). Strong opposition from environmental groups, who fear their impacts upon scenic viewsheds, has prevented this state from giving offshore projects a green light.

In the 7 plus years since the Zoning Code was amended, no wind projects have been constructed in Allegany County and no permit applications have been finalized, although there has been significant speculation. Projects are currently operating in nearby Pennsylvania and West Virginia, and at least one other project is currently under consideration in Mineral County. It has been less than a year since a wind farm application in Garrett County was denied.

Since 2002, a great deal of new data and information has been developed. Some of this comes about as a direct result of actual experiences, as thousands of these devices have been erected in many jurisdictions within the United States and throughout the world. As one would expect, the personal experiences have differed and there is tremendous variance in opinions.

As of this writing, there are probably hundreds of jurisdictions around the country wrestling with wind energy issues. For nearly all, the first step is to determine whether these uses will be encouraged or prohibited. At this point, there are no clear data indicating the proportion of those jurisdictions who favor or oppose.

The jurisdictions who have determined that the problems and liabilities associated with wind energy outweigh the benefits, have taken (or are in the process of taking) steps to prohibit these uses. This is being accomplished primarily through the adoption of new zoning and/or subdivision regulations.

Those jurisdictions opting to facilitate wind energy are also modifying their codes to allow these uses. [NOTE: Prior to the early/mid 1990's very few local governments recognized these activities as a distinct land use in need of regulation.] Most local governments require that a use be specifically mentioned if it is to be permitted. For example, if a zoning code cites a list of uses that are permitted by right and a list of those permitted by special exception, it is appropriate that we infer that any other use is prohibited. Therefore, a specific use that was not envisioned at the time of the code's adoption – no matter how innocuous – is considered to be prohibited unless it is specifically mentioned.

It should be further noted that most jurisdictions who modify their codes to permit the erection of wind facilities are also adopting some type of restrictive provisions to regulate these uses. These regulations are designed to safeguard the interests of the local jurisdiction as well as adjacent uses. These safeguards vary from jurisdiction to jurisdiction, but most include some form of controls relating to: height; separation, setback or buffering (sometimes all three); electromagnetic interference (EMI); decommissioning requirements, and bonding or performance requirements. The apparent philosophy of the policymakers in these jurisdictions is that they can adopt appropriate safeguards while still being “pro-wind”.

In March 2008, in response to citizen concerns, the Planning & Zoning Commission of Allegany County directed staff to review current County zoning regulations to assess their adequacy. In June, Staff reported that current regulations failed to adequately

protect adjacent uses and the interests of a number of stakeholder interests. The Planning Commission then directed Staff to conduct a comprehensive examination and to develop specific recommendations for Code changes.

As earlier stated, a tremendous volume of wind energy-related literature has been developed since 2002. Unfortunately, relatively little objective information exists – possibly, because the use is still a relatively new operation and unbiased data is still being collected and analyzed. Another reason is the fact that the vast majority of studies and reports have been prepared or commissioned by wind energy advocates or wind energy opponents. As a result, most of the findings tend to champion one side of the issue. For example, one report discussed devastatingly negative property value impacts as a direct result of the construction of a wind energy farm; a subsequent report prepared under the auspices of the industry found little or no negative property value impacts. Was the first report exaggerated and/or misleading? Were the findings in the other study biased or “influenced”? It is difficult to know where the truth lies. To ignore the findings of the wind opponents would be irresponsible. To blindly accept the views of the industry would be naïve.

In attempting to successfully wade through this confusing flood of issues, non-issues, information, misinformation and disinformation, staff has relied upon common sense and the guiding principles of land use law; to wit, all uses have some impacts, and the purpose of planning, zoning, subdivision and other land use regulations are to manage the use, protect the rights of affected individuals, and balance competing interests in an effective manner, so as to equitably limit those impacts. The difficulty, as always, is the degree of impact that competing stakeholders are willing to accept.

After examining some of the issues and concerns linked with the deleterious impacts of wind devices, as advanced by wind opponents, the only logical course of action is to ban the use outright. This will satisfy those who oppose the erection of wind towers in Allegany County. Anything short of a complete and total ban will produce some level of dissatisfaction upon the part of individuals with this viewpoint. Therefore, unless the County chooses to outlaw wind energy conversion systems, then there will definitely be some portion of stakeholders who are unhappy.

However, an outright ban negatively impacts wind developers and the rights of private property owners. This is an illustration of the classic case of competing desires and the need to develop an equitable compromise. By its nature, a compromise will result in something other than one of the two extremes: ie., a ban or a “no restrictions whatsoever” approach. Failing to ban these uses, however, is far different from issuing a carte blanche permit to do anything, anywhere, at anytime. In fact, existing County zoning regulations already limit these uses. In an effort to logically and objectively administer this debate, staff assumed that wind energy devices would be permitted, however, greater restrictions and enhanced protections were necessary to address some of the potential issues and concerns.

In keeping with the Planning Commission's previous directive (following staff's findings of insufficiency) to develop alternatives for consideration, staff prepared a number of proposals dealing with buffers, setbacks, electromagnetic interference, height, and bonding requirements. These proposals were vetted through the Planning Commission at several Business Meetings and Work Sessions (all public meetings) over a period of several months. Feedback from members and the public served to refine these proposals to a point where – in November – the Planning Commission directed staff to prepare a summary document that identified specific recommendations for the regulation and management of these uses.

In order to adequately regulate these uses, it was determined that a new, more detailed, set of definitions would be necessary. After discussion, the Planning Commission agreed to the following definitions, via consensus:

WIND TURBINE – See WIND ENERGY DEVICE.

WIND ENERGY DEVICE – A wind energy conversion device (usually a turbine) that produces electricity. Turbines are typically manufactured as “Horizontal Axis” or “Vertical Axis”. Wind Energy Devices can be classified as industrial, agricultural, or domestic, see “INDUSTRIAL WIND ENERGY CONVERSION SYSTEMS”, AGRICULTURAL WIND ENERGY DEVICE, and “DOMESTIC WIND ENERGY CONVERSION SYSTEMS”.

AGRICULTURAL WIND ENERGY DEVICE A single wind energy device situated in an agricultural setting that is designed and intended to utilize wind power to generate electricity, or in the case of certain agricultural applications to power equipment or machinery, such as pumps, gears, wheels, mills, or similar mechanical devices incidental to farming. Energy produced by such devices is primarily intended for the use of the individual landowner upon whose property the device is situated. This use shall be limited exclusively to the ‘A’ and ‘C’ Districts.

DOMESTIC WIND ENERGY DEVICE – A single wind energy device situated in a residential setting that is designed and intended to utilize wind power to generate electricity primarily for the use and/or benefit of the individual landowner upon whose property the device is situated.

INDUSTRIAL WIND ENERGY CONVERSION SYSTEMS (WECS) – An aggregation of parts including the base, tower, generator, rotor, blades, supports, guy wires and accessory equipment such as utility interconnect and battery banks, etc., in such configuration as necessary to convert the power of wind into mechanical or electrical energy, i.e., wind charger, windmill or wind turbine. The energy produced by such systems is intended for sale to large-scale energy providers through the grid system.

INDUSTRIAL WIND FARM – [Also referred to as “ARRAY”.] Area arranged and dedicated to the construction and maintenance of more than one (1) Wind Energy Conversion System. The energy produced by such systems is intended for sale to large-scale energy providers through the grid system.

These definitions differentiate between and among the various types and purposes of wind turbines. This will facilitate their regulation in subsequent areas by imposing restrictions that are commensurate to their application and their impact.

After significant discussion, the Planning Commission agreed that the minimum separation distances needed to be increased to aid in the mitigation of noise, vibration, and visual impacts. It was further determined, that these distances needed to be greater in instances where the use would result in larger, more intense uses. The most logical and equitable way to achieve this objective is to impose minimum separation requirements for domestic turbines and increase those standards for agricultural turbines, with another increase for industrial turbines.

Minimum Separation Distances (Domestic WECS):

- A. One hundred (100) feet from any structure not the property of the applicant.
- B. Two hundred (200) feet from any residential structure (other than the principal use).
- C. One thousand (1,000) feet from all schools.
- D. One thousand (1,000) feet from any site listed on the National Register of Historic Places.

Minimum Separation Distances (Agricultural WECS):

- A. Two hundred (200) feet from any structure not the property of the applicant.
- B. Five hundred (500) feet from any residential structure (other than the principal use).
- C. One thousand (1,000) feet from all schools.
- D. One thousand (1,000) feet from any site listed on the National Register of Historic Places.

Minimum Separation Distances (Industrial WECS):

- A. One thousand (1,000) feet from any structure not the property of the applicant.
- B. Two thousand (2,000) feet from any residential structure.
- C. Five thousand (5,000) feet from all schools.
- D. Five thousand (5,000) feet from any site listed on the National Register of Historic Places.
- E. One thousand (1,000) feet from the habitats of Rare, Threatened, or Endangered (RTEs) Species as delineated on DNR, Heritage Division Environmentally Significant Areas (ESAs) maps.

- F. Applications for Industrial WECS within five thousand (5,000) feet of the habitats of documented federally-endangered species shall include review and compliance documents from U.S. Fish & Wildlife Service. Acceptable documents include: FONSI (Finding of No Significant Impact). EA (environmental Assessment), or EIS (Environmental Impact Statement).

\* Applicants opting to participate and abide by the recommendations of a DNR Environmental Review shall be exempt from the provisions of Item E.

In each of the three instances, Items 'A' and 'B' attempted to minimize the negative impacts to nearby properties, while Item 'C' sought to promote a favorable learning environment and protect children. Items 'D' and 'E' are intended to protect cultural and environmental resources. A supplemental requirement (Item 'F') was included for Industrial WECS. This additional item required that all applicants coordinate with the U.S. Fish & Wildlife Service when projects were proposed to be located within 5,000' of the habitats of Federally-listed RTEs (Rare, Threatened or Endangered Species). In such instances, the USFWS will almost certainly require extensive environmental analysis and their standards are certainly more stringent than anything the County might consider imposing. The intended purpose is simply to encourage coordination with Federal experts who possess the appropriate training and expertise to identify and/or manage this type of unique impact. Finally, in another attempt to encourage coordination with environmental professionals, an extra provision was included in the Industrial WECS provisions that provides an exemption for applicants who voluntarily work with the Maryland Department of Natural Resources. Imposing a 1,000' buffer from sensitive habitats may be appropriate in some instances and inappropriate in others. DNR scientists and heritage experts can advise applicants with a greater degree of specificity and accuracy based upon the degree of sensitivity and the tolerance of the species. Encouraging applicants to work with DNR is a win-win for all parties.

In addition to minimum separation distances, the Planning Commission reviewed options for establishing adequate parcel boundary setbacks. For domestic and agricultural devices it was determined that it was appropriate that applicants observe a minimum setback distance equal to no less than two (2.0) times the height of the unit. This will ensure that the unit and all of its components will remain on the property of the unit's owner in the event of a catastrophic failure. The current height calculation methodology ignores the length of the unit's blades. Therefore, it was determined that the unit's height should be determined by measuring the unit from ground level at the base of the structure to the highest point of the blade at its greatest extension.

For industrial units, the Planning Commission felt that it made sense to use a sliding scale that linked the structure's height with the setback requirement. This ensures equity, since it varies the punitive nature of the setback in direct proportion to the degree of impact (height). Each individual WECS with a height less than two hundred (200) feet should observe a minimum setback distance of one and one-half (1.5) times the height of the unit. For individual WECS with heights greater than two hundred (200) feet but less than three hundred (300) feet, the setback distance should be two (2.0) times the height of the

unit. Finally, WECS with a height greater than three hundred (300) feet should be setback two and one-half (2.5) times the height of the unit. As with domestic and agricultural units, setback distances are to be measured from the base of the unit to property boundaries in all directions. Unit height is to be determined by measuring the unit from ground level at the base of the structure to the highest point of the blade at its greatest extension.

Issues associated with structure height were also discussed. One advantage to linking setbacks with structure height is that it helps to prevent the construction of wind towers with needless or excessive heights. This also reduces the need for significant additional regulations concerning structure height. After discussion, the Planning Commission determined that domestic wind energy devices should be limited to a height of forty (40) feet, or the height of the principle structure, whichever is lower; and agricultural wind energy devices should be limited to one hundred (100) feet in height.

Concern was expressed that unless a disincentive was established, applicants might opt to build industrial wind structures as tall as possible to gain flexibility for future operations or simply to avoid future permit reviews. Since the visual impact of these uses is a direct function of their height, it is best that they are limited to the most minimal height that is absolutely necessary to ensure unit operability. Consequently, industrial WECS greater than three hundred (300) feet in height shall be authorized only after the Board of Zoning Appeals determines that the extra height is technically or functionally necessary and after satisfactory findings that the additional height shall not disproportionately impact other property owners. It was felt that it was appropriate to have the applicant bear the burden of establishing sufficient evidence to support the additional height requested.

Most local jurisdictions require some type of surety to protect the community in the event of default or abandonment. If a wind developer experiences financial hardship resulting in bankruptcy or some other type of legal/financial problem, who is responsible for removal, restoration and disposal? Expenses associated with removal, restoration and disposal could be extensive. In fact, cost estimates suggest that these expenses could exceed \$150,000.00 for each individual wind tower unit.

Another area of concern is that of electromagnetic emissions and the potential for communication interference. This can be readily addressed by requiring that an "Interference Analysis" be conducted prior to construction to identify potential concerns in advance. These concerns could then be remedied prior to construction by structure siting and configuration.

Even the best pre-construction analysis could fail to uncover every possible problem and the obvious fact that pre and post-construction conditions are markedly different could serve to create conditions where interference exists where none was forecast. This situation would be remedied by requiring the wind developer to post "Interference Bond" prior to construction. In the event that post-construction conditions result in interference, this bond would be utilized to fund a post-construction Interference Analysis to identify the problem. Once the problem is identified, it should be corrected by the wind



developer. All costs associated with any such remedial actions should be borne by the wind developer.

### **RECOMMENDATIONS:**

As expeditiously as possible, the County should implement provisions to safeguard stakeholders' interests by enacting legislation to manage impacts associated with wind energy devices. Specifically, these provisions should address separation distances, setbacks, height limitations, electromagnetic interference, and decommissioning. The County should also adopt several new definitions to facilitate a more accurate and effective regulation of these uses.

This report recommends modifying the Allegany County Zoning Code to institute six (6) new definitions, as follows:

WIND TURBINE – See WIND ENERGY DEVICE.

WIND ENERGY DEVICE – A wind energy conversion device (usually a turbine) that produces electricity. Turbines are typically manufactured as “Horizontal Axis” or “Vertical Axis”. Wind Energy Devices can be classified as industrial, agricultural, or domestic, see “INDUSTRIAL WIND ENERGY CONVERSION SYSTEMS”, AGRICULTURAL WIND ENERGY DEVICE, and “DOMESTIC WIND ENERGY CONVERSION SYSTEMS”.

AGRICULTURAL WIND ENERGY DEVICE A single wind energy device situated in an agricultural setting that is designed and intended to utilize wind power to generate electricity, or in the case of certain agricultural applications to power equipment or machinery, such as pumps, gears, wheels, mills, or similar mechanical devices incidental to farming. Energy produced by such devices is primarily intended for the use of the individual landowner upon whose property the device is situated. This use shall be limited exclusively to the ‘A’ and ‘C’ Districts.

DOMESTIC WIND ENERGY DEVICE – A single wind energy device situated in a residential setting that is designed and intended to utilize wind power to generate electricity primarily for the use and/or benefit of the individual landowner upon whose property the device is situated.

INDUSTRIAL WIND ENERGY CONVERSION SYSTEMS (WECS) – An aggregation of parts including the base, tower, generator, rotor, blades, supports, guy wires and accessory equipment such as utility interconnect and battery banks, etc., in such configuration as necessary to convert the power of wind into mechanical or electrical energy, i.e., wind charger, windmill or wind turbine. The

energy produced by such systems is intended for sale to large-scale energy providers through the grid system.

INDUSTRIAL WIND FARM – [Also referred to as “ARRAY”.] Area arranged and dedicated to the construction and maintenance of more than one (1) Wind Energy Conversion System. The energy produced by such systems is intended for sale to large-scale energy providers through the grid system.

Since the primary area of concern, to-date, has been industrial wind generation facilities, it is only logical that immediate code modifications should focus upon this specific type of wind energy device. Therefore, immediate code modifications should primarily address industrial wind devices and save agricultural and domestic devices for the more comprehensive code modification currently underway, but not projected to be finalized until the early Summer 2009 timeframe.

The following minimum Separation Distances should be instituted for Industrial WECS:

- A. One thousand (1,000) feet from any structure not the property of the applicant.
- B. Two thousand (2,000) feet from any residential structure.
- C. Five thousand (5,000) feet from all schools.
- D. Five thousand (5,000) feet from any site listed on the National Register of Historic Places.
- E. One thousand (1,000) feet from the habitats of Rare, Threatened, or Endangered (RTEs) Species as delineated on DNR, Heritage Division Environmentally Significant Areas (ESAs) maps.
- F. Applications for Industrial WECS within five thousand (5,000) feet of the habitats of documented federally-endangered species shall include review and compliance documents from U.S. Fish & Wildlife Service. Acceptable documents include: FONSI (Finding of No Significant Impact). EA (environmental Assessment), or EIS (Environmental Impact Statement).

\* Applicants opting to participate and abide by the recommendations of a DNR Environmental Review shall be exempt from the provisions of Item E.

The following setback requirements shall be instituted for industrial WECS:

Each individual WECS with a height less than two hundred (200) feet shall observe a minimum setback distance equal to no less than one and one-half (1.5) times the height of the unit. Setback distances shall be measured from the base of the unit to property boundaries in all directions. Unit height shall be determined by measuring the unit from ground level at the base of the structure to the highest point of the blade at its greatest extension.

Each individual WECS with a height greater than two hundred (200) feet but less than three hundred (300) feet shall observe a minimum setback distance equal to no less than two (2.0) times the height of the unit. Setback distances shall be measured from the base

of the unit to property boundaries in all directions. Unit height shall be determined by measuring the unit from ground level at the base of the structure to the highest point of the blade at its greatest extension.

Each individual WECS with a height greater than three hundred (300) feet shall observe a minimum setback distance equal to no less than two and one-half (2.5) times the height of the unit. Setback distances shall be measured from the base of the unit to property boundaries in all directions. Unit height shall be determined by measuring the unit from ground level at the base of the structure to the highest point of the blade at its greatest extension.

With regard to height, industrial WECS greater than three hundred (300) feet in height shall be authorized only after the Board of Zoning Appeals determines that the extra height is technically or functionally necessary and after satisfactory findings that the additional height shall not disproportionately impact other property owners. The applicant shall bear the burden of evidence in such cases.

To safeguard telecommunication and other issues of concern related to electromagnetic interference, the following provisions should be adopted and followed for all industrial wind energy applications:

- A. Applicant shall prepare an Interference Analysis
- B. Analysis shall be performed at applicant's expense
- C. Analysis shall conform to County's established guidelines/scope
- D. Completed analysis shall be provided to following parties of interest:
  - (1) Office of Emergency Management
  - (2) Department of Public Safety
  - (3) All municipalities within five (5) mile radius
  - (4) All Emergency responders within one (1) mile radius (including Police, Fire, Ambulance and Paramedic)
  - (5) Maryland State Police
  - (6) Maryland State Police Medevac
  - (7) Allegany County Sheriff's Office
  - (8) Owners of all telecommunications towers within five (5) mile radius
  - (9) All radio stations operating within County or within five (5) mile radius if located outside the County
  - (10) All radio, television, or satellite transmission entities within on-the-ground facilities (including transmission towers) in Allegany County
  - (11) All telecommunications entities (including wireless transmission and receiving companies and cellular telephone services) licensed to operate within the state of Maryland
  - (12) All television stations operating within the County or within a five (5) mile radius if located outside the County.

- (13) FCC
  - (14) FAA
  - (15) All Allegany County Public Libraries, and
  - (16) Shall be posted on the Allegany County Web Site.
- E. The applicant shall be required to conform/adhere to conditions/stipulations of analysis and shall further be required to satisfactorily address any problems or concerns identified in the report.
- F. All entities identified in Item D above shall be provided 90 calendar days to review the Interference Analysis and provide comments to Planning Commission and the Office of Land Development Services.
- G. The County shall have the right to impose supplemental conditions and/or require the elimination or reconfiguration of all or any part of a proposed project on the basis of feedback provided by any of the identified entities in Item D above and is accompanied by supporting data.
- H. The applicant shall be required to conform/adhere to conditions/stipulations imposed by the County.
- I. Prior to receiving authorization, applicant shall post bond in the amount of \$100,000.00 to cover the cost of preparation of subsequent Interference Analyses. Any such analysis shall be prepared under the direction and management of the County. The applicant shall conform/observe all recommendations for interference reduction and/or elimination, as identified in subsequent Interference Analysis. Failure to do so within a reasonable period of time shall result in the forfeiture of project bond and the suspension of all County-issued permit authorizations.
- J. During the post-construction phase, interference with Public Safety or Emergency Management communications shall constitute sufficient justification for temporary (partial and/or total) project shut down.
- K. Repeated and substantiated claims of interference from any of the entities identified in Item D above shall constitute sufficient justification to initiate the provisions of Item I above and shall constitute sufficient justification for temporary (partial and/or total) project shut down.
- L. All Wind Energy Systems shall comply with FCC Interference Regulation, Title 47, Chapter 1.

Finally, to address de-commissioning concerns discussed earlier in this report, the County should initiate the following policy for all industrial WECS applications:

No permit for erection or construction shall be executed until the applicant shall have submitted a bond equal to one hundred fifty thousand (\$150,000.00) dollars for each individual WECS. The bond shall be held by the Allegany County Finance Department until such time as the structure is removed at the applicant's expense or is utilized by the County to remove the structure. The bond shall be utilized as surety in the event of noncompliance on the part of the applicant, or in the event that the unit ceases operation for a period of time greater than 180 days. If the unit is sold, the bond will be released only after the new owner shall have posted a new bond with the Finance Department. The County reserves the right to re-assess bond amounts in the event of a transfer of unit ownership. Finally, Construction Price Indexing shall be utilized to ensure that bond values keep pace with costs fluctuations.