

Making Residential Renewable Energy Uses Possible within the City of Ames: *Continued Discussion*

August 5, 2009 Planning & Zoning Commission

As a follow up to the July 15, 2009 Planning & Zoning Commission meeting, some changes have been made to reflect the discussion. The changes are noted by underlines for new text and ~~striketrough~~ for deletions. The discussion at tonight's meeting will immediately follow the field trip that we have planned to visit a small wind turbine near Ames. If there were some observations about the wind turbine that have not yet been reflected in these concepts, then additional changes will be made. Also, any new suggestions by the Commission will be incorporated. These concepts will be presented and discussed with City Council at their workshop on August 18, 2009. Staff will then take the Council's comments and incorporate them with the result being the actual code language, which will then be brought back to Planning & Zoning Commission on September 2, 2009. At the September 2nd meeting the Commission will be asked to recommend the consolidated language to City Council for an official first reading of the code amendments at its regular meeting on September 22, 2009.

Based on the Commission's July 15th discussion, the square footage maximum for "attached" or "roof-mounted" solar systems has been removed. It seemed arbitrary and difficult to determine at this point what an individual property owner might need. Further, if the concern is fully aesthetic, it might actually be more desirable to have an entire roof covered, if they are flush mounted. However, the square footage limit was left in place for freestanding panels (or "arrays"), consistent with zoning regulations that limit overall lot coverage and accessory building placement. Those existing regulations are in place for aesthetics, as well as the general benefits of access to air and light for all citizens. If systems are permitted by the Zoning Board of Adjustment in the front yard, the height limit of four (4) feet was added, consistent with fence height regulations already in place. Clarification was also added for different "attached system" scenarios. Flexible film-type systems are intended to be allowed without a Special Use Permit by this code, because they are "flush-mounted" by design.

A "demarcation" site visit process was added so that applicants would not be challenged with the unreasonable cost of doing a complete three-dimensional rendering just to show that the proposed system is not actually visible from abutting street rights of way.

For wind systems, the sound criteria was revised to incorporate concerns of staff and the Commission that sound and frequency measurement would be very difficult to enforce. Manufacturer's specification information may be sufficient at this time. The technology is quickly changing, and sound may not be an issue in the foreseeable future. The required industry standard certification for solar and wind was also loosened to reflect the concerns that home-built and experimental systems are very possible in Ames. It is possible that home built systems use approved materials and design but can not be certified in a reasonable time frame, even if they meet all electrical codes.

Even though there is not adequate data to demonstrate that small wind turbines fall over, the setback requirement of 110 percent has been left in this report. But, it has been highlighted that a minimum lot size is not required. A report of the number of residential lot sizes where small wind turbines would be possible without a Special Use Permit will be presented at the August 5th meeting. Acceptance may need to grow before citizens can be comfortable with these structures, like they are with light poles and cell towers. As discussed in the previous meeting, the industry-certified towers will exceed International Building Code standards. This issue may need to be highlighted with City Council to understand the community's perspective more accurately.

The density of the number of wind systems per acre was also clarified, but still requires a Special Use Permit for more than one per lot. The variety of possible types of multi-turbine systems is too great to anticipate at the writing of this report. There are types of rooftop systems in development that are proposed to be sold at hardware stores, which is evidence that the technology is moving very quickly and may require further code revisions within a short time frame. Municipal planning departments do not have the assistance of federal regulations and requirements similar to the Cell Tower Act of 1996, so there is a wide variety of regulation. The state of Iowa has passed legislation, which requires a model ordinance and the implementation of incentive zones in cities. But, it is unclear if the fall 2009 target date will be met. There is also discussion of the Des Moines metro council adopting a unified regulation system.

The code concepts are as follows:

Section 13.09 Solar Energy Systems

Solar Energy Systems as defined in the Definitions shall be considered an accessory use in all zoning districts. The purpose of this section is to establish regulations to facilitate the installation and construction of Solar Energy Systems so that systems are safe, effective, and efficient, as well as harmonious with the character of the adjacent area where located.

The following standards shall apply to the development of Solar Energy Systems:

1. Freestanding Solar Energy Systems shall not be located in any front setback, but can be allowed within the front yard that is beyond the front setback, subject to approval of a Special Use Permit by the Zoning Board of Adjustment.
2. Setbacks: Six (6) feet from all property lines and other structures.
3. Location: The system shall be located on the same lot as the building being served. Where there is no building, the system is not allowed, unless through an approved Neighborhood Solar Energy System.
4. Height: Freestanding systems shall not exceed six (6) feet in height in side and rear yards. Freestanding systems in a front yard shall not exceed four (4) feet in height. The height shall be measured from the grade at system base to the highest peak, including any adjustable systems.

5. Size: Freestanding systems on residentially used properties shall not exceed the greater of one-tenth (1/10) the footprint of the principal structure or one hundred (100) square feet, whichever is greater. The size of systems for non-residential properties shall not exceed one-half (1/2) of the footprint of the principle structure. Freestanding system installation shall not cause non-conformance with the maximum site coverage and minimum landscaped area in the applicable zone. The measurement of the system is of the surface area in the plane parallel to the receiving surface, regardless of angle of the surface. There is no size limit on attached systems.

6. Calculation-Exempt Freestanding systems:

- ~~a) Systems in which the cumulative surface area of all systems on the property is 4 square feet or less, or~~
- ~~b) Systems or building parts integral to the structure, that are passive (Passive Solar Energy Systems) in nature and do not project from the structure, or~~
- ~~c) An attached system not visible from abutting street rights of way at any time of the year~~
- d) A freestanding system not visible from abutting street rights of way at any time of the year
- e) Calculation-Exempt systems still require all permits, but are not included in square footage limits. See definition.

7. Zoning Permit-Exempt systems:

- a) Systems in which the cumulative surface area of all systems on the property is 4 square feet or less
- b) Systems or building parts integral to the structure, that are passive (Passive Solar Energy Systems) in nature and do not project from the structure

8. Attached Solar Energy Systems are permitted to be located on the roof or attached to a building or a structure ~~with another primary purpose~~, subject to all of the following:

- a) No part of the system shall extend more than five (5) feet above the roof line or 5 feet in any direction from the exterior surface of supporting structure; and
- b) Systems shall not exceed the maximum height in the zoning district if attached to the principal structure; and
- c) System installation is certified as structurally sound by an engineer licensed in Iowa.
- d) The building must have another primary purpose; and
- e) The flush mount requirement below; and
- f) Systems shall not exceed the maximum height in the zoning district if attached to an accessory structure; and
- g) No system shall be attached to a structure that is not in conformance with height and setback standards for the zone, unless the system does not cause an increase in the height or setback nonconformity; and
- h) Attached systems are allowed on the front wall of the principal structure subject to approval of a Special Use Permit by the Zoning Board of Adjustment; and
- i) Attached systems are allowed on other walls, without a Special Use Permit. Attached systems can project into a required setback subject to approval of a Special Use Permit.

9. Flush mount requirement. Attached, Roof Mounted on Residentially Zoned or Residentially Used Property: Roof attached systems may be mounted on principal and accessory building roofs provided they conform to the maximum height standards established in the zone. Additionally, systems shall be mounted parallel to the pitch of the roof and be no higher than 6 inches from the roof surface. Systems not meeting this standard are allowed subject to approval of a Special Use Permit by the Zoning Board of Adjustment. A system or a portion of a system not visible from abutting street rights of way is exempt from this requirement. Attached systems not on residential properties do not have to meet this requirement.

~~10. Attached systems are allowed on any part of accessory buildings as long as the accessory building conforms to all other zoning regulations and the attachment location is no closer to a street right of way than the principal building. Attached systems are allowed on the front wall of the principal structure subject to approval of a Special Use Permit by the Zoning Board of Adjustment.~~

10. Code Compliance: Solar Energy Systems shall comply with all applicable building and electrical codes.

11. Solar Access: A property owner who has installed or intends to install a solar energy system shall be responsible for negotiating with other property owners in the vicinity for any necessary solar easement.

12. Historic Districts: All solar energy systems within a historic overlay district shall apply for a certificate of appropriateness subject to approval by the Historic Preservation Commission and standards within Chapter 31, Municipal Code. None are exempt.

13. Review Procedure: The Planning Director shall prescribe the application form and any necessary submittal requirements, as needed, to determine compliance with this section. When review is completed, the approval shall constitute a Solar Energy System Zoning Permit and the applicant shall then seek any other necessary permits and approvals before installation. The Zoning Permit can be revoked if there is documented evidence which documents non-compliance with the permit. The Zoning Permit application shall include, but not limited to:

- a) A plot plan showing:
 - 1) structures on the lot
 - 2) proposed system
 - 3) property lines
 - 4) setback dimensions
 - 5) rights of way
- b) elevation views and dimensions
- c) manufacturer's photographs
- d) manufacturer's spec sheet including capacity
- e) a statement certifying that there are no applicable restrictive covenants
- f) Demarcation of dimensions. For systems claiming exemption due to "no-visibility" from abutting street rights of way, the applicant shall place demarcation posts, guides or balloons and schedule an appointment for staff to confirm no visibility.

When a Solar Energy System Special Use Permit is required, it shall constitute the equivalent of the Solar Energy System Zoning Permit, and shall be approved by the Zoning Board of Adjustment, by considering the below ~~matters~~ criteria only (and not the general criteria other

Special Use Permits in Section 15). The ZBA can request additional information if insufficient information is presented to determine conformance with the criteria. The Special Use Permit can be revoked after public hearing, if there is documented evidence which documents non-compliance with the permit.

All of A, B and C:

- a) The system will be harmonious with the character of the neighboring properties as they exist on the date of approval, which is defined as properties within 200 feet of the system property
- b) Access to open space (air and light) from the neighboring properties is not significantly reduced
- c) If in a historic district, the HPC shall provide a written recommendation of support to the Zoning Board of Adjustment
- d) ~~A written complaint resolution procedure has been presented~~
- e) The building density of the general area in which the system is proposed to be located
- f) Whether the system conforms with all other city, state and federal regulations

AND EITHER

- g) If a unique topography, vegetation or lot configuration exists which can allow the system to be located and operated to not have significant impact on neighboring properties as listed in a, b, c and e above

OR

- h) If unique placement of the principal structure on the lot exists which can allow the system to be located and operated in a way that does not have significant impact on neighboring properties as listed in a, b, c and e above

14. Interconnection: Interconnected Solar Energy Systems are allowed subject to the standards in this section. Evidence of a signed interconnection agreement with the applicable electric utility shall be submitted to the Department of Planning & Housing prior to approval of any interconnected solar energy system. The applicant is encouraged to work with the applicable utility before purchasing equipment. The maximum allowable rated capacity of an Interconnected Solar Energy System is 10 kW, or 10,000 Watts unless evidence from the applicable utility has demonstrated that safe interconnection can be achieved and the need is justifiable for the principal use of the property. Any system over 100 kW is not allowed.

15. Abandonment: System use shall be determined abandoned under the provisions of Section 29.307, which requires notice by the Zoning Enforcement Officer. The system shall be removed within 90 days of the termination date, at the cost of the property owner.

16. Screening: Systems shall not be considered mechanical equipment or units and shall not require screening as defined in Section 29.408(4) except as determined through the Special Use Permit process.

17. Covenants: Before a Solar Energy System Zoning Permit is issued, the applicant shall certify that there are no covenants or restrictions on the property preventing the system or use.

18. Signage: All signs, other than the manufacturer's or installer's identification, appropriate warning signs, or owner identification on a system, building, or other structure associated with a solar energy system visible from any street right of way shall be prohibited.

19. Commercial systems: A Commercial Solar Energy System is not allowed in the City of Ames.

20. Neighborhood systems: A Neighborhood Solar Energy System is only allowed in the F-PRD (Floating - Planned Residence District) zone.

22. Appearance: The property owner of any solar energy system shall maintain such system in a safe and attractive manner, including replacement of defective parts, painting, cleaning, and other acts that may be required for the maintenance and upkeep of the function and appearance of such a system. The owner shall also maintain the ground upon which the system is located in an orderly manner, such that is free of debris, tall grass and weeds, and any associated structures remain quality in appearance.

23. Industry standard: Before any Solar Energy System zoning permit is issued for a Solar Energy System, evidence shall be shown that the system and parts meet industry standards, such as Underwriters Laboratories (UL), or another standard applicable to the technology and materials of the system.

Definitions:

Solar Energy System – All exterior and above ground parts of a panel or other solar energy device including legs/braces and/or supporting devices, the primary purpose of which is to provide for the collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling or water heating.

Freestanding Solar Energy System – A Solar Energy System which is completely self-supported. A freestanding system is not an accessory structure, as defined in Section 29.402.

Attached Solar Energy System – A Solar Energy System which requires support by another structure, whether roof or otherwise, and does not connect directly to the ground. An attached system is not a minor projection, as defined in Section 29.402.

Interconnected Solar Energy System – A Solar Energy System which produces electricity and is capable of distributing surplus electricity to the public or other properties outside the control of the system's owner, even if the system is temporarily or automatically disconnected by a switch or other mechanical device.

Passive Solar Energy System – A Solar Energy System that does not produce electricity and does not use active mechanical systems for energy transfer.

Calculation-Exempt Solar Energy System – A Freestanding Solar Energy System that is not included in square footage maximums set forth in this section. Not exempt from all other codes, regulations, permits, and approvals. A zoning permit is still required.

Zoning Permit-Exempt Solar Energy System – A Solar Energy System that does not require a zoning permit for installation. Not exempt from all other codes, regulations, permits and approvals.

Commercial Solar Energy System – A Solar Energy System which is intended to produce electricity for sale to a rate regulated or non-regulated utility or for use off site.

Neighborhood Solar Energy System – A Solar Energy System that is intended to serve a single subdivision, neighborhood or small grouping of residential dwellings.

Section 13.10 Wind Energy Systems

Wind Energy Systems as defined in the Definitions shall be considered an accessory use in all zoning districts. The purpose of this section is to establish regulations to facilitate the installation and construction of Wind Energy Systems so that systems are safe, effective, and efficient, as well as harmonious with the character of the adjacent area where located.

The following standards shall apply to the development of Wind Energy Systems (WES):

1. Tower Height: For property sizes less than 5 acres the tower height shall be limited to 80 ft. For property sizes of 5 acres or more, tower heights are limited to 120 feet. Exceeding tower heights is allowed subject to approval of a Special Use Permit by the Zoning Board of Adjustment and an engineer's certification that the height is needed for achieving clearance from obstructions existing at the time of application.
2. Size: In residential zones, the diameter of the swept area for freestanding systems shall be no larger than 12 feet, measured at the greatest width. In other zones, the diameter is limited to 30 feet. Greater diameter is allowed subject to approval of a WES Special Use Permit.
3. Set-back: The wind energy system shall be setback a distance equal to one hundred ten (110) percent of the height of the tower, plus the blade length from all adjacent property lines, and a distance equal to one hundred fifty (150) percent of the tower plus blade length from any dwelling inhabited by humans on neighboring property on the date of approval of any Wind Energy System zoning permit. These setbacks may be reduced by approval of a Special Use Permit when notarized consent of the owner of the property on which the requested wind energy system is to be erected and the adjoining landowner whose property line or dwelling falls within specified distance on the date of approval is submitted. Wind energy systems shall also meet all setback requirements for principal structures for the zoning district. Additionally, no portion of the wind energy system, including guy wire anchors, may extend closer than ten (10) feet to the property line. Freestanding wind energy systems in residential zones shall be located no closer to any public street right of way than the principal structure, unless completely in the rear yard, but not less than 110 percent of the height of the tower plus the blade length. There is no minimum lot size requirement.
4. Location: Freestanding wind energy systems shall not be located in the front yard of any zone. Freestanding systems shall be located on a lot only as an accessory use/structure to an existing principal use/structure, unless through an approved Neighborhood Wind Energy System.
5. ~~Noise: Audible noise due to wind energy system operations shall not exceed thirty (30) dBA for any period of time, when measured at any residence, school, hospital, church, or public library existing on the date of approval of any Wind Energy System zoning permit. An engineer, architect, or landscape architect shall certify the sound criteria at the time of application submittal.~~
5. Audible and Low Level Noise: Wind energy systems located within or abutting a residential zoning district shall not be audible from the property line. Low level sound: no wind system in any zone shall be operated so that impulsive low frequency sound adversely affects the habitability or use of any off-site dwelling unit, hospital, school, library or nursing home.

In the event the noise levels resulting from the proposed wind energy system exceed the criteria listed above, a Special Use Permit may be granted by the Zoning Board of Adjustment provided that the following has been accomplished:

Written consent from the affected property owners has been obtained stating that they are aware of the wind system and the noise limitations imposed by this Ordinance, and that consent is granted to allow noise levels to exceed the maximum limits otherwise allowed.

6. Industry Standard Wind Turbines: Small wind turbines must have been approved under a small wind certification program recognized by an industry standard such as American Wind Energy Association. Before any Wind Energy System zoning permit is issued for a Wind Energy System, evidence shall be shown that the system and parts meet industry standards, such as Underwriters Laboratories (UL), or another standard applicable to the technology and materials of the system.

7. Compliance with Building Code: Building Permit applications for small wind energy systems shall be accompanied by standard drawings of the wind turbine structure, including the tower, base, and footings. An engineering analysis of the tower showing compliance with the Building Code and certified by a licensed professional engineer shall also be submitted. This analysis is frequently supplied by the manufacturer. Iowa licensed engineer wet stamps shall not be required unless soil conditions are outside of manufacturer parameters. If the soil conditions are not readily known, the Building Official may require a soil study by an engineer licensed in Iowa. A building permit application must be submitted simultaneous with an application for any Wind Energy System zoning permit, whether attached, or freestanding.

8. Airport Protection: No wind energy system shall be constructed, altered, or maintained so as to project above any of the imaginary airspace surfaces described in FAR Part 77 of the FAA guidance on airspace protection unless notice has been given to the FAA and the system is, in writing, not deemed a hazard by the FAA or the local airport administrator. Lighting shall not be permitted on any wind energy system. If lighting is a recommendation of the FAA, for the system, the system shall only be allowed in General Industrial Zones.

9. Compliance with National Electric Code: Building Permit applications for small wind energy systems shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code. This information is frequently supplied by the manufacturer.

10. Interconnection: Interconnected Wind Energy Systems are allowed subject to the standards in this section. Evidence of a signed interconnection agreement with the applicable utility shall be submitted to the Department of Planning & Housing prior to approval of any interconnected system. The applicant is encouraged to work with the applicable utility before purchasing equipment. The maximum allowable rated capacity of an Interconnected Wind Energy System is 10 kW, or 10,000 Watts unless evidence from the applicable utility has demonstrated that safe interconnection can be achieved and the need is justifiable for the principal use of the property. Any system over 100 kW is not allowed.

11. Abandonment: System use shall be determined abandoned under the provisions of Section 29.307, which requires notice by the Zoning Enforcement Officer. The system shall be removed within 90 days of the termination date, at the cost of the property owner.

12. Screening: Systems shall not be considered mechanical equipment or units and shall not require screening as defined in Section 29.408(4) except as determined through the Special Use Permit process.

13. Covenants: Before a Wind Energy System Zoning Permit is issued, the applicant shall certify that there are no covenants or restrictions on the property preventing the system or use.

14. Tower type: Monopole type towers shall be the only type allowed, except for General Industrial Zones. Other types of towers are allowed in zones not General Industrial subject to ZBA approval of a Special Use Permit. Monopoles in residential zones shall be limited to 18 inches in diameter at the base. Exceeding these width criteria is allowed subject to approval of a Special Use Permit.

15. Color and Paint Finish: Systems shall be non-reflective finish, neutral color and not to be repainted differently than the manufacturer color or finish.

16. Number of Systems: Only one converter is allowed for properties less than 5 acres in size. More than one ~~generator~~ converter is allowed subject to approval of a Wind Energy System Special Use Permit, but not to exceed the gross density of more than one converter per acre of the subject property. ~~More than one converter is allowed on properties larger than 5 acres as long as the system is not a Commercial Wind Energy System.~~

~~17. Attached systems: Systems attached to existing structures are allowed in any zone. In any residential zone, attached systems are limited to 6 square feet in size, cumulatively, unless not visible from a street right of way any time of the year. Other attached systems are allowed subject to approval of a Special Use Permit by the Zoning Board of Adjustment.~~

17. Attached systems (roof mounted or otherwise) are allowed in any zone, subject to the following:

- a) limited to 6 square feet in size, measured in a single plane
- b) systems not visible from a street right of way any time of the year are not limited in size.
- c) no attached system on a residential property can extend more than 5 feet in any direction from the structure
- d) no attached system can exceed the maximum height allowable in the zone for the structure to which attached
- e) proposed systems exceeding any of these criteria can only be approved subject to the approval of Special Use Permit

18. Wind Access: A property owner who has installed or intends to install a wind energy system shall be responsible for negotiating with other property owners in the vicinity for any necessary wind easement.

19. Historic Districts: All wind energy systems within a historic overlay district shall apply for a certificate of appropriateness subject to approval by the Historic Preservation Commission and standards within Chapter 31, Municipal Code. None are exempt.

20. Zoning Permit Exempt systems:

- a) ~~Systems in which the cumulative area of all systems on the property is less than 6 square feet in size, as measured in a single plane, or~~
- b) Attached systems integral to the structure, that do not project from the structure, such as systems with architecturally concealed turbines, or
- c) ~~Attached systems not visible from abutting street rights of way at any time of the year~~

21. Review Procedure: The Planning Director shall prescribe the application forms and any necessary submittal requirements, as needed, to determine compliance with this section. When review is completed, the approval shall constitute a Wind Energy System Zoning Permit and the applicant shall seek any other necessary permits and approvals before installation. The Zoning Permit can be revoked, if there is documented evidence which documents non-compliance with the permit. The zoning permit application shall include, but not limited to:

- a) A plot plan showing:
 - 1) structures on the lot
 - 2) proposed system
 - 3) property lines
 - 4) setback dimensions
 - 5) rights of way
- b) elevation views and dimensions
- c) manufacturer's photographs
- d) manufacturer's spec sheet including capacity
- e) a statement certifying that there are no applicable restrictive covenants
- f) a copy of a complete application materials for building permit application
- g) a statement from the Building Official regarding code compliance for proposal
- h) Demarcation of dimensions. For systems claiming exemption due to "no-visibility" from abutting street rights of way, the applicant shall place demarcation posts, guides or balloons and schedule an appointment for staff to confirm no visibility.

When a Wind Energy System Special Use Permit is required, it shall constitute the equivalent of the Wind Energy System Zoning Permit, and shall be approved by the Zoning Board of Adjustment, by considering the below ~~matters~~ criteria only (and not the general criteria other Special Use Permits in Section 15). The ZBA can request additional information if insufficient information is presented to determine conformance with the criteria. The Special Use Permit can be revoked after public hearing, if there is documented evidence which documents non-compliance with the permit.

All of A, B and C:

- a) The system will be harmonious with the character and uses of the neighboring properties as they exist on the date of approval, which is defined as properties within 200 feet of the system property
- b) Access to open space (air and light) from the neighboring properties is not significantly reduced
- c) If in a historic district, the HPC shall provide a written recommendation of support to the Zoning Board of Adjustment
- d) ~~A written complaint resolution procedure has been presented~~
- e) The building density of the general area in which the system is proposed to be located
- f) Whether the system conforms with all other city, state and federal regulations

AND EITHER

g) If a unique topography, vegetation or lot configuration exists which can allow the system to be located and operated to not have significant impact on neighboring properties as listed in a, b, c and e above

OR

h) If unique placement of the principal structure on the lot exists which can allow the system to be located and operated in a way that does not have significant impact on neighboring properties as listed in a, b, c and e above

22. Access: Any climbing foot pegs or rungs below 12 feet of a freestanding tower shall be removed to prevent unauthorized climbing. For lattice or guyed towers, sheets of metal or wood may be fastened to the bottom tower section such that it cannot readily be climbed. Fencing is not required unless otherwise required by Special Use Permit.

23. Signage: All signs, other than the manufacturer's or installer's identification, appropriate warning signs, or owner identification on a wind generator, tower, building, or other structure associated with a wind energy system visible from any street right of way shall be prohibited.

24. Commercial systems: A Commercial Wind Energy System is not allowed in the City of Ames.

25. Neighborhood systems: A Neighborhood Wind Energy System is only allowed in the F-PRD (Floating - Planned Residence District) zone.

26. Appearance: The property owner of any wind energy system shall maintain such system in a safe and attractive manner, including replacement of defective parts, painting, cleaning, and other acts that may be required for the maintenance and upkeep of the function and appearance of such a system. The owner shall also maintain the ground upon which the system is located in an orderly manner, such that is free of debris, tall grass and weeds, and any associated structures remain quality in appearance. All electric wires from the wind system to the control facilities, shall be located underground or concealed by the supporting structure.

Definitions:

Wind Energy System (WES) – An aggregation of exterior and above ground parts including the base, tower, generator, rotor, blades, supports, guywires, and accessory equipment such as utility interconnect, etc, in such configuration as necessary to convert the power of wind into mechanical or electrical energy, e.g., wind charger, windmill, or wind turbine. This definition includes electric and non-electric systems.

Small Wind Energy System – A Wind Energy System which has a rated capacity of up to one hundred (100) kW and which is incidental and subordinate to a permitted use on the same parcel or lot. A system is considered a small wind energy system only if it supplies electrical power solely for on site use, except that when a parcel on which the system is installed also receives electrical power supplied by a utility company, excess electrical power generated and not presently needed for on site use may be used by the utility company in accordance with section 199, chapter 15.11(5) of the Iowa Administrative Code.

Commercial Wind Energy System – A Wind Energy System which is intended to produce electricity for sale to a rate regulated or non-regulated utility or for use off site.

Freestanding Wind Energy System – A Wind Energy System which is completely self-supported. A freestanding system is not an accessory structure, as defined in Section 29.402.

Attached Wind Energy System – A Wind Energy System which requires support by another structure, whether roof or otherwise, and does not connect directly to the ground.

Interconnected Wind Energy System – A Wind Energy System which produces electricity and is capable of distributing surplus electricity to the public or other properties outside the control of the system's owner, even if the system is temporarily or automatically disconnected by a switch or other mechanical device.

Exempt Wind Energy System – A Wind Energy System that does not require a zoning permit. Not exempt from all other codes, regulations, permits and approvals.

Neighborhood Wind Energy System – A Wind Energy System that is intended to serve a single subdivision, neighborhood, or small grouping of residential dwellings.

Zoning Permit-Exempt Wind Energy System – A Wind Energy System that does not require a zoning permit for installation. Not exempt from all other codes, regulations, permits and approvals.

Blade – The device or assembly of devices which responds to the wind movement and is attached to the ~~generator~~ converter.

Converter – The device which is either a mechanical or mechanical/electrical component that converts wind movement to another form of energy, such as the inverter in the case of an electrical system, and the gearbox, in the case of a mechanical system.