

Making Residential Renewable Energy Uses Possible within the City of Ames: A Roundtable Discussion prior to presenting draft code to City Council

July 15, 2009

Planning & Zoning Commission

In response to the past various meetings and workshops regarding renewable energy, the city staff would like to engage the Planning and Zoning Commission in discussing the attached regulations before requesting a recommendation be forwarded to the City Council for the consideration of draft code language. First, are bullet points noted during past public discussions. Second, is “springboard” language for solar and wind energy systems within the City of Ames. Although, the public discussion focus has been on residential zones, this language would apply in all zones. Some of this language has been borrowed from other jurisdictions and adapted based on the needs for Ames. Some is also brand new language based on the public feedback received thus far, comments from the commission, research by planning staff, and coordination with the Electric Department.

Solar

- Intended to encourage solar energy use and development within the city
- Intended to address concerns of aesthetics based on public feedback
- Not intended to regulate Trombe walls or structural features designed to be completely passive with no liquid transfer medium or electrical current as part of the system
- Free standing solar is not intended to be an accessory building or accessory structure because the accessory building and accessory structure standards do not consider solar equipment, therefore a new definition has been created.
- Attached and roof mounted solar is intended to be regulated less than freestanding, based on public feedback for aesthetics.

Wind

- Intended to encourage wind energy use and development within the City of Ames
- Intended to address concerns of height, setback, general safety, noise and aesthetics based on public feedback
- Freestanding and attached wind systems are addressed

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.
4. Height: Freestanding systems shall not exceed six (6) feet in height.
5. Size: 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.
6. Exempt 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
7. 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;
 - b) Systems shall not exceed the maximum height permitted in the zoning district in which it is located; and
 - c) System installation is certified as structurally sound by an engineer licensed in Iowa.

8. Residentially Zoned or Residentially Used Property, Roof Mounting: 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.

9. 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. 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 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

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 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.

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 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 and c 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 and c 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 utility 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 except as determined through the Special Use Permit process.

17. Covenants: Before a 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 public road 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.

21. 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.

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.

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.

Exempt Solar Energy System – A Solar Energy System that does not require a zoning permit. 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 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.
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.
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.

In the event the noise levels resulting from the 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. Wind Turbines: Small wind turbines must have been approved under a small wind certification program recognized by the American Wind Energy Association.
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 except as determined through the Special Use Permit process.
13. Covenants: Before a 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 is allowed subject to approval of a Wind Energy System Special Use Permit. 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.

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. None are exempt.

20. 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 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
- g) a statement from the Building Official regarding code compliance

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 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.

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 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 and c 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 and c 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 public road 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.

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.

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

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.