



DEPARTMENT OF COMMUNITY DEVELOPMENT SERVICES

Planning Division

m e m o r a n d u m

TO: Laurel Lunt Prussing, Mayor

FROM: Elizabeth H. Tyler, Ph.D, FAICP, Community Development Services Director

DATE: September 22, 2010

SUBJECT: Wind Energy Systems Text Amendment to the Urbana Zoning Ordinance (Plan Case 2115-T-09)

Introduction

The Zoning Administrator is requesting an amendment to the Urbana Zoning Ordinance to add regulations for the siting, installation and operation of wind energy systems within the corporate boundaries and the one-and-one-half mile extraterritorial jurisdictional (ETJ) of the City of Urbana.

The Urbana Plan Commission reviewed this case and held a public hearing at their August 5, August 19, and September 9, 2010 meetings. Minutes of all three meetings are attached. The Plan Commission on September 9 recommended approval of the attached draft ordinance by a vote of 6 ayes and 0 nays.

Following the Plan Commission’s recommendation, the Urbana Committee of the Whole reviewed the draft ordinance at its September 13, 2010 meeting. At that meeting, it was requested City staff research several questions, including setback requirements for onsite monopole wind towers as well as noise as an ongoing maintenance concern.

Discussion

Wind tower setbacks

Councilmember Smyth requested review of the proposed wind tower setback standards compared with wind standards from other communities. First, the Illinois Municipal Code (65 ILCS 5/11-13-26) limits Illinois municipalities from imposing setbacks greater than 1.1 times the height of the wind energy system from property lines, but the same code does not impose a minimum setback. The assumed purpose of this requirement is to prevent exclusionary zoning practices.

Model state wind energy system codes were consulted. The following provides recommended setback requirements for municipal and county codes in their respective states:

Recommended Minimum Setbacks

Illinois model wind code: 1.1 times the tower height from residences and property lines.

Wisconsin model wind code: 1.1 times the system height from property lines, unless appropriate easements are secured from adjacent property owners.

Minnesota model wind code: 1.1 times the total system height for noncommercial turbines.

New York model wind code: “Most local government requirements include setbacks for the distance between the wind turbine and residences/other buildings, property lines and roads. Property lines should always be part of the setback formula in order to provide consistency and not endanger future uses on adjacent parcels. ... Setbacks should be at least as great as the height of the turbine.”

Second, wind energy system zoning standards from Illinois counties were gathered. (See attached “Counties with Wind Ordinances” matrix.) Of the thirty Illinois counties with wind ordinances, the vast majority require a minimum property line setback of either 1.0 or 1.1 times the tower or system height.

The third source of information is found in a comparison with area municipalities, as follows:

Urbana (proposed): 1.1 times the system height from property lines, street rights-of-way, and overhead utility lines.

Champaign: 1.0 times the system height from property lines.

Champaign County: For small wind turbines assembled on the ground and tilted up: one times the tower height from property lines. Other small wind towers can be located in minimum required yards, but the tower must be set back at least 1.11 times the system height from any dwelling under different ownership.

McLean County: 110% of the system height from all adjacent property lines, road right-of-way, railroad right-of-way, and right-of-way for overhead electrical transmission or distribution lines.

Another way to view proposed setback requirements wind energy systems is to compare with existing Urbana tower requirements. Section XIII-1 of the *Urbana Zoning Ordinance* provides standards for telecommunications towers. According to Section XIII-1.E.5, towers in residential zoning districts are limited to 50 feet in height and generally must be set back at least 200% of the tower height from any residential setback line. Towers in industrial zoning districts must be set back at least 100% of the tower height from a residential zoning district and land use setback line, and towers in business zoning districts must be set back at least 150% of the tower height from a residential zoning district or use setback line. Setback requirements may be reduced in special circumstances.

In summary, model state wind codes, Illinois county wind codes, and area municipal and county codes are quite similar in requiring a setback of 1.0 or 1.1 times the total system height from property lines. A few codes instead require that setback to be from zoning setback lines for buildings on adjacent properties. Urbana’s existing Telecommunications Ordinance requires 1.0, 1.5, or 2.0 times the tower height, but it should be noted that for comparison purposes cell towers do not include rotors.

It should be noted that applicants for both wind towers and telecommunications towers could apply for a height variance in situations where there are special circumstances specific to the property.

City staff recommends that the City Council maintain the standard provided in the attached draft ordinance, as recommended by the Urbana Plan Commission.

Noise and Ongoing Maintenance

Councilmember Roberts asked City staff to review noise standards and ongoing maintenance. It is anticipated that wind turbines will produce more noise as time progresses. The sound level limits

provided on page 10 of the attached ordinance would apply to all wind turbines, regardless of age. Consequently, Urbana will be able to require that unreasonable wind turbine noise be abated.

Recommendation

At their September 9, 2010 meeting, the Urbana Plan Commission recommended approval of the draft wind energy systems ordinance as attached by a vote of 6 ayes and 0 nays. City staff concurs with this recommendation. City staff recommends that the Committee of the Whole forward the attached draft ordinance to the October 4, 2010 Urbana City Council for **APPROVAL**.

Robert Myers, AICP, Planning Manager

Attachments: Draft Wind Energy Systems Ordinance
Counties With Wind Ordinances matrix (Illinois Institute for Rural Affiars)
Aug. 5, 2010 Plan Commission minutes
Aug. 19, 2010 Plan Commission minutes
Sept. 9, 2010 Plan Commission minutes

cc: John Hall, Champaign County Department of Planning and Zoning
Morgan Johnston, U of I Facilities & Services, mbjohnst@illinois.edu

ORDINANCE NO. 2010-09-075

**AN ORDINANCE APPROVING A TEXT AMENDMENT TO THE ZONING ORDINANCE
OF THE CITY OF URBANA, ILLINOIS**

(Enacting Section XIII-7, "Wind Energy Systems" - Plan Case No. 2115-T-09)

WHEREAS, the City Council of the City of Urbana, Illinois, adopted Ordinance No. 9293-124 on June 21, 1993 consisting of a comprehensive amendment to the 1979 Zoning Ordinance of the City of Urbana, also known as the Urbana Zoning Ordinance; and

WHEREAS, Illinois State law (65 ILCS 5/11-13-26) enables municipalities to regulate wind farms and electric-generating wind devices within both their corporate limits and their one-and-one-half mile extra territorial jurisdictions.

WHEREAS, the Urbana Zoning Administrator has submitted a petition to amend the Urbana Zoning Ordinance to enact Section XIII-7, Wind Energy Systems, of the Urbana Zoning Ordinance, said petition having been presented to the Urbana Plan Commission at their August 5, August 19, and September 9, 2010 meetings; and

WHEREAS, after publication in accordance with Section XI-7 of the Urbana Zoning Ordinance and with Chapter 24, Section 11-13-14 of the Illinois Revised Statutes, the Urbana Plan Commission held a public hearing on August 5, August 19, and September 9, 2010 to consider the proposed amendment; and

WHEREAS, the Urbana Plan Commission at their September 9, 2010 meeting voted 6 ayes to 0 nays to forward the proposed revision with a recommendation for approval; and

WHEREAS, after due and proper consideration, the Urbana City Council has deemed it to be in the best interests of the City of Urbana to amend the text of the Urbana Zoning Ordinance as described herein.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF URBANA, ILLINOIS, as follows:

Section 1. A new Section XIII-7, *Wind Energy Systems*, of the Urbana Zoning Ordinance is hereby enacted to read as follows:

Section XIII-7. Wind Energy Systems

A. Purpose

The purpose of this section is to further the goals and objectives of the Urbana Zoning Ordinance in promoting the use of wind as an alternative energy source. This section regulates the siting, installation and operation of wind energy systems to allow the effective and efficient use of wind resources while protecting the health, safety, and welfare of nearby residents and the general public.

B. Wind Energy System Definitions

Ambient Sound: The all-encompassing sound at a given location, usually a composite of sounds from many sources near and far. For the purpose of this section, the "ambient sound level" shall mean the quiescent background level, that is, the quietest of 10-second average sound levels measured when there are no nearby or distinctly audible sound sources. Daytime ambient measurements should be made during mid-morning, weekday hours while nighttime measurements should be made after midnight.

Anemometer Tower: A temporary wind speed indicator constructed for the purpose of analyzing the potential for utilizing a wind energy system at a given site. This includes the tower, base plate, anchors, cables and hardware, wind direction vanes, booms to hold equipment, data logger, instrument wiring, and any telemetry devices that are used to monitor or transmit wind characteristics over a period of time for either instantaneous wind information or to characterize the wind resource at a given location.

Horizontal-Axis Wind Turbine: A tower-mounted turbine in which the rotor is mounted horizontally.

Rotor: The rotating part of a wind turbine, including the blades and blade assembly or the rotating portion of the generator.

Rotor Diameter: The diameter of the circle swept by the rotor. For measurement purposes this means the distance from the outer-most tip of the blade to the center of the turbine rotor multiplied by two.

Shadow Flicker: A repetitive oscillation of light and shadow cast when light passes through and is interrupted by moving wind turbine blades.

Sound Level: The A-weighted sound pressure level in decibels (dB) (or the C-weighted level if specified) as measured using a sound level meter that meets the requirements of a Type 2 or better precision instrument according to the American National Standards Institute (ANSI) S1.4. The “average” sound level is time-averaged over a suitable period using an integrating sound level meter that meets the requirements of ANSI S12.43.

System: See definition for *Wind Energy System*.

System Height: The vertical distance measured from the finished grade at the foot of the system to the outer-most tip of the rotor when the tip is at its highest point.

Tower-Mounted Wind Turbine: A wind turbine mounted on a structure that is designed and constructed primarily for the purpose of elevating and supporting a wind generator, including freestanding lattice towers, monopole towers or guyed towers.

Urbana Extraterritorial Jurisdiction: The unincorporated territory lying within one and one-half (1½) miles of the corporate limits of the City of Urbana, excluding the areas located within the subdivision jurisdiction of another municipality.

Vertical-Axis Wind Turbine: A wind turbine in which the rotor is mounted vertically.

Wind Energy System: A wind turbine and all directly supporting components, including any base, blade, foundation, generator, nacelle, rotor, tower, transformer, vane, wire, inverter, and batteries.

Wind Energy System, Building-Mounted: A relatively small wind turbine and components mounted on a building and which generates power for on-site use.

Wind Energy System, On-Site: A Wind Energy System that is incidental and subordinate to and which generates power for the principal use of the zoning lot on which it is situated. A wind energy system is considered on-site even if excess electricity is used by the utility company in exchange for a reduction in the cost of electrical power supplied by that company.

Wind Energy System, Pre-Existing: Any wind energy system which is operational on the effective date of this section.

Wind Energy System, Service Area: A wind energy system intended to provide power to a small grouping of uses within a single zoning district.

Wind Energy System, Utility:

- a) A wind energy system that exceeds the maximum system height, or maximum rotor diameter standards provided by this Section for an on-site tower-mounted wind energy system; or
- b) Groupings of wind energy systems, often maintained by one entity, which generate power on-site to be transferred to a transmission system for distribution to customers.

Wind Turbine: A rotary mechanical device that extracts energy from the wind for either direct mechanical use or conversion to electrical energy.

C. *Applicability*

1. The provisions of this section shall apply to wind energy systems erected and operated within the corporate limits of the City of Urbana and within the unincorporated territory lying within one and one-half (1½) miles of those corporate limits (Urbana Extraterritorial Jurisdiction) per statutory authority granted in Chapter 65 ILCS 5/11-13-26.
2. All zoning districts and zoning regulations cited are as enacted by the City of Urbana or Champaign County, whichever is applicable to the subject property.
3. All wind energy systems shall be erected, constructed, installed and modified in conformance with the provisions of this section, and all other applicable regulations, as evidenced by the issuance of a Building Permit, and any other necessary zoning or development approvals.
4. Pre-existing wind energy systems shall be exempt from the provisions of this section with the exception of maintenance, removal of abandoned systems and those which specifically apply to pre-existing systems. Pre-existing wind energy systems shall be permitted to continue per Section XIII-7.N.

D. *Temporary Wind Turbines.* An anemometer tower is permitted in all zoning districts as a temporary use for no more than eighteen (18) months. An extension of this time period, not to exceed an additional eighteen (18) months, may be granted at the discretion of the Zoning Administrator upon submittal and review of sufficient evidence to support the requested extension.

E. *Wind Energy Systems Permitted by Right*

1. *Building-Mounted Wind Energy Systems.* Within all zoning districts, a building-mounted wind energy system is permitted as an accessory use to any permitted principal use other than common-lot-line dwellings. A building-mounted wind energy system shall only be permitted within a condominium development if authorized by the condominium association board, and if provisions are made for the maintenance of said system in the condominium development bylaws or other applicable legal document, subject to the review and approval of the City of Urbana.

All building-mounted wind energy systems shall be subject to the following requirements:

- a) Design Standards as set forth in Section XIII-7.I.
- b) *Maximum Height:* 10 feet as measured from the highest point of the roof for all uses in residential zoning districts; and 15 feet as measured from the highest point of the roof for all uses in non-residential zoning districts.
- c) *Maximum Rotor Diameter:* 10 feet.
- d) *Minimum Setback:* Shall be equal to the required minimum yard (front, rear, side) for the zoning district in which it is located. The setback shall be measured horizontally from the furthest outward extension of all moving parts to the nearest property line.
- e) *Minimum Separation:* If more than one building-mounted wind energy system is installed, a minimum distance equal to the height of the highest system must be maintained between the bases of each system.

- f) *Maximum Quantity*: The maximum number of systems per property shall be based on setback and separation requirements as set forth in this section.
 - g) *Building Support*: The building upon which the system is to be mounted shall be able to safely support operation of the wind energy system. Certification by a structural engineer licensed in the State of Illinois shall be required as part of the building permit process by the City of Urbana.
2. *On-Site Tower-Mounted Wind Energy System*. An on-site tower-mounted wind energy system is a permitted accessory use within all zoning districts. An on-site tower-mounted wind energy system shall only be permitted on the commons area within a condominium development if authorized by the condominium association board, and if provisions are made for the maintenance of said system in the condominium development bylaws or other applicable legal document, subject to the review and approval of the City of Urbana.

All on-site tower-mounted wind energy systems shall be subject to the following requirements:

- a) Design Standards as set forth in Section XIII-7.I.
- b) *Maximum System Height*:
 - (1) Residential Zoning Districts: 120 feet.
 - (2) Non-Residential Zoning Districts: 175 feet, except that the maximum system height shall be limited to 120 feet if located within 500 feet of an existing residence, the boundary of a residentially zoned property, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s).
- c) *Maximum Rotor Diameter*:
 - (1) Residential Zoning Districts: 30 feet.
 - (2) Non-Residential Zoning Districts: 70 feet, except that maximum rotor diameter shall be limited to 30 feet if located within 500 feet of an existing residence, the boundary of a residentially zoned property, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s).
- d) *Lot Size*: No minimum lot size.
- e) *Location*: Entirely behind the principal building in residential and commercial zoning districts. Wind energy systems shall not be constructed on any public easement.
- f) *Minimum Setback*: A distance equal to the system height from all property lines, public street right-of-way lines and overhead utility lines. The setback shall be measured from the center of the tower's base. No guy wire anchors may extend closer than ten feet to the property line, or the distance of the required setback in the respective zoning district, whichever results in a greater setback.

F. Wind Turbines Permitted by a Special Use Permit

- 1. *Service Area Tower-Mounted Wind Energy Systems*. A service area tower-mounted wind energy system may be erected in all zoning districts with the issuance of a Special Use Permit. A Special Use Permit for a proposed service area tower-mounted wind energy system shall be evaluated in consideration of the factors set forth in Section XIII-7.G and along with compliance to

the design standards of Section XIII-7.I. A Special Use Permit application shall be submitted in accordance with Article VII of this Ordinance. If the owner of a system is not the owner of land on which the system is located, the City may require that a bond be posted, at time of approval of a Special Use Permit, for the removal of the system.

All service area tower-mounted wind energy conversion systems permitted as a special use shall be subject to the following requirements:

- a) Design Standards as set forth in Section XIII-7.I.
- b) *Maximum System Height:* 175 feet.
- c) *Maximum Rotor Diameter:* 70 feet.
- d) *Minimum Setback:* A distance equal to the system height from property lines of those properties which are not a part of the service area, public street right-of-way lines and overhead utility lines. The setback shall be measured from the center of the tower's base.
- e) *Maximum Quantity:* As determined by the Special Use Permit.

2. *Utility Tower-Mounted Wind Energy System.* A utility tower-mounted wind energy system may be erected in all agricultural and industrial zoning districts as established by either the City of Urbana or by Champaign County within Urbana's ETJ and in the CRE and any future university zoning districts as established by the City of Urbana with the issuance of a Special Use Permit. A Special Use Permit for a proposed utility tower-mounted wind energy system shall be evaluated in consideration of the factors set forth in Section XIII-7.G and along with compliance to the design standards of Section XIII-7.I. A Special Use Permit application shall be submitted in accordance with Article VII of this Ordinance. If the owner of a system is not the owner of land on which the system is located, the City may require that a bond be posted, at time of approval of a Special Use Permit, for the removal of the system.

All utility tower-mounted wind energy conversion systems permitted as a special use shall be subject to the following requirements:

- a) Design Standards as set forth in Section XIII-7.I.
- b) *Maximum System Height:* 400 feet.
- c) *Maximum Rotor Diameter:* 300 feet.
- d) *Lot Size:* The minimum lot size shall be equal to the minimum lot size for the zoning district in which the system is located.
- e) *Minimum Setback:* A distance equal to the total height of the system from all property lines, public street right-of-way lines and overhead utility lines. In addition said system shall be located a minimum of 1,200 feet from an existing residence, the boundary of a residentially zoned property, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s). The setback shall be measured from the center of the tower's base.

TABLE XIII-1. SUMMARY OF WIND ENERGY SYSTEMS ALLOWED

TURBINE TYPE	USE STANDARD		MINIMUM SETBACK	MAXIMUM SYSTEM HEIGHT	MAXIMUM ROTOR DIAMETER
	<i>Permitted Use</i> (Accessory Use Only)	<i>Special Use</i> (Accessory or Principal Use)			
Building Mounted	All Zoning Districts		Shall be equal to the required minimum yard (front, rear, side) for the zoning district in which it is located.	10 feet as measured from the highest point of the roof for all uses in residential zoning districts; and 15 feet as measured from the highest point of the roof for all uses in non-residential zoning districts	10 feet
On-Site Tower-Mounted	Residential Zoning Districts		A distance equal to the system height from all property lines, public street right-of-way lines and overhead utility lines.	120 feet	30 feet
	Non-residential Zoning Districts			175 feet, except that the maximum system height shall be limited to 120 feet if located within 500 feet of an existing residence, the boundary of a residentially zoned property, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s).	70 feet, except that the maximum rotor diameter shall be limited to 30 feet if located within 500 feet of an existing residence, the boundary of a residentially zoned property, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s).
Service Area Tower-Mounted		All Zoning Districts	A distance equal to the system height from property lines of those properties which are not a part of the service area, public street right-of-way lines and overhead utility lines.	175 feet	70 feet
Utility Tower-Mounted		All agricultural and industrial zoning districts as established by either the City of Urbana or by Champaign County within Urbana's ETJ and in the CRE and any future University zoning districts as established by the City of Urbana	A distance equal to the total height of the system from all property lines, public street right-of-way lines and overhead utility lines. In addition said system shall be located a minimum of 1,200 feet from an existing residence, the boundary of a residentially zoned property, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s).	400 feet	300 feet

G. Evaluation of a Wind Energy System Special Use Permit

Following the procedures established in Article VII, the Plan Commission, in evaluating a Special Use for a utility or residential service area tower-mounted wind energy system, shall consider the following factors in addition to the requirements identified in Section VII-4.A:

1. Number of systems and their location;
2. The number of systems relative to the size of the parcel on which the systems are proposed to be located;
3. The height of the system relative to the size of the parcel on which the system is proposed to be located;
4. The need for the proposed height of the system in order to allow the system to operate efficiently;
5. The need for the rotor diameter and/or number of systems in order to serve the site effectively;
6. The uniformity of design, including tower type, color, number of blades, and direction of blade rotation for multiple system proposals;
7. The building density of the general area in which the system is proposed to be located;
8. The nature of existing and planned future land use on adjacent and nearby properties;
9. Proximity to an existing residence, residential zoning district, or the boundary of a property that is in Urbana's ETJ and designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s);
10. Land use compatibility and impact on orderly development;
11. Location of other wind energy systems in the surrounding area;
12. Proximity to transmission lines to link the systems to the electric power grid;
13. Surrounding topography;
14. Proximity to environmentally sensitive areas and the environmental impact of the system;
15. Whether the design of the proposed system reflects compliance with the design standards of Section XIII-7.I;
16. Whether a substantial adverse effect on public safety will result from the height or rotor diameter of the system or some other aspect of the system's design or proposed construction;
17. Consistency with the Urbana Comprehensive Plan; and
18. Any other factors relevant to the proposed system.

H. *Wind Energy System Special Use Expiration.* A Special Use Permit issued pursuant to this section expires if:

1. A building permit for the wind energy system has not been requested by means of a complete application within two years of approval of the Special Use Permit.
2. The wind energy system is abandoned and removed per Section XIII-7.M.

I. *Design Standards.* In addition to all other applicable requirements of this Section, wind energy systems shall be constructed in conformance with the following design standards:

1. *Visual Appearance*

- a) *Tower Type:* Monopole type tower is required in all zoning districts with the exception of all City of Urbana industrial districts and in all Champaign County agricultural and industrial zoning districts in Urbana's ETJ.
- b) *Color:* Non-reflective, non-obtrusive color such as off white, light gray, or other neutral color, or the color supplied by the manufacturer. The required coloration and finish shall be maintained throughout the life of the system.
- c) *Lighting:* No artificial lighting is allowed unless required by the Federal Aviation Administration (FAA) or other applicable authority. If lighting is required, the lighting alternatives and design chosen must cause the least disturbance to surrounding land uses.
- d) *Signs:* All signs, both temporary and permanent, are prohibited on a wind energy system with the exception of one warning sign no more than four square feet in area.
- e) *Electrical System:* All on-site electrical transmission lines connecting a wind energy system to a building or public utility electricity distribution system shall be located underground. As-built plans shall be submitted showing the location of underground conduit and cable located within the public right-of-way.

2. *Safety*

- a) *Tower Access:* Towers shall be designed to prevent climbing within the first 12 feet from the ground. Access to the tower shall be limited by locating all climbing apparatus to no lower than 12 feet from the ground and by providing any other applicable anti-climbing measures.
- b) *Equipment Access:* All ground-mounted electrical and control equipment shall be labeled and secured to prevent unauthorized access.
- c) *Ground Clearance:* The minimum distance between the ground and any part of the rotor blade system of a tower-mounted horizontal-axis wind energy system shall be 20 feet. For a tower-mounted vertical-axis wind energy system, no moving portions of the turbine shall be located any closer than 10 feet above the adjacent finished grade.
- d) *Overspeed Controls:* All on-site tower-mounted wind energy systems shall be equipped with automatic and manual braking systems. Utility tower-mounted wind energy systems shall be equipped with a redundant braking system, including both aerodynamic over-speed controls and mechanical brakes.
- e) *Force Wind Standard:* At a minimum, a wind energy system shall be engineered to withstand a wind velocity 110 miles per hour.

3. *Electromagnetic Interference.* All wind energy systems shall be designed and sited such that no disruptive electromagnetic interference is caused to communication systems, contrary to Federal Communication Commission requirements for electromagnetic interference and/or other State or local laws. All turbines shall utilize nonmetallic rotor blades unless the applicant can supply documentation from an independent testing laboratory certifying that any proposed metallic blade rotor will not cause electromagnetic interference.
4. *Vibration.* All wind energy systems shall not produce vibrations which are humanly perceptible beyond the property on which a wind energy system is situated.
5. *Sound Level Limitations*
 - a) The sound level limits identified below shall apply. Established Sound Level Measurement Procedures shall be used that account for ambient sound contributions.

Receiving Property	Hours of Operation	Sound Level Limits
Residential	10:00 pm – 7:00 am	45 dB(A)
Residential	7:00 am – 10:00 pm	55 dB(A)
Non-Residential	24 hours	60 dB(A)
Industrial	24 hours	65 dB(A)

- b) No system shall operate with an average sound level more than 5 dB (A) above the non-operational ambient level, as measured at the property line.
 - c) To limit the level of low frequency sound, the average C-weighted sound level during system operation shall not exceed the A-weighted ambient sound level by more than 20 dB.
 - d) Applications for wind energy systems requiring a Special Use Permit shall include an environmental sound impact study that gives:
 - (1) Certified manufacturer’s specification of the sound emissions from similar turbines that specifically state that the overall sound level as well as the 1/3-octave band levels measured in accordance with IEC 61400-11.
 - (2) The expected maximum one minute averaged A- and C-weighted sound level at the property line with all turbines operating.
 - (3) The daytime and night time quiescent ambient sound levels at the property line as measured by an environmental acoustics expert (board certified by the Institute of Noise Control Engineering).
6. *Shadow Flicker*
 - a) Applications for wind energy systems requiring a Special Use Permit shall include a shadow flicker study. Using available software, the applicant shall show calculated locations of shadow flicker caused by a wind energy system and the expected duration in total number of hours per year of the flicker cast upon adjacent dwellings, residential zoning districts, or areas in Urbana’s ETJ that are designated for future residential use by the Urbana Comprehensive Plan Future Land Use Map(s).
 - b) Wind energy systems requiring a Special Use Permit shall be sited in a manner that does not result in significant shadow flicker impacts on adjacent properties. Significant shadow flicker is defined as more than 30 hours per year on any residential structure. The applicant has the burden of providing evidence that the shadow flicker will not have significant adverse impact. Potential shadow flicker shall be addressed either through siting or other approved mitigation measures.

7. *Federal Aviation Administration (FAA) Compliance.* All wind energy systems shall comply with all applicable regulations of the FAA, including required FAA permits for installation closer than two miles to an airport. The applicant shall be responsible for determining the applicable FAA regulations and securing the necessary approvals.
 8. *Industry Standards.* All wind energy systems shall conform to applicable industry standards, including those of the American National Standards Institute (ANSI). Owners shall submit certificates of design compliance that equipment manufacturers have obtained from Underwriters Laboratories (UL), National Renewable Energy Laboratories (NREL), Det Norske Veritas (DNV), Germanischer Lloyd Wind Energie (GL), or an equivalent third party.
- J. *Code Compliance.* All wind energy systems shall meet the City of Urbana Building Code, Erosion Control Ordinance, Subdivision and Land Development Code and all other applicable codes and ordinances of the City of Urbana.
- K. *Maintenance.* All wind energy systems shall be maintained in good condition and in safe working order throughout the life of the system. If the system is not maintained in operational condition and/or poses a potential safety hazard, the owner shall immediately correct the situation at their expense. Any wind energy system found to be unsafe by the Zoning Administrator or appointed designee, must stop operation immediately upon notification. If the owner fails to correct the unsafe condition, the Zoning Administrator may remove or cause to be removed, altered or repaired an unsafe wind energy system immediately and without notice, if, in his/her opinion, the condition of the system is such as to present an immediate threat to the safety of the public. If a wind energy system remains inoperable for a period of 180 days, it shall be deemed abandoned and the procedures under Section XIII-7.M applied.
- L. *Violation.* Should a wind energy system or any part thereof violate the requirements of this Section, the owner shall cease operations immediately. Upon receipt of a complaint or the notice of a complaint from the owner, the Zoning Administrator shall make a determination as to whether there is a violation requiring the immediate cessation of operation. The system may resume operation once the violation(s) have been remedied.
- M. *Abandonment and Removal.* A wind energy system shall be deemed abandoned if not functioning for a continuous period of 180 days, and there is no demonstrated plan to restore the equipment to operating condition. The City will issue a Notice of Abandonment for the removal of an abandoned wind energy system as follows:
1. The Zoning Administrator is authorized to issue a Notice of Abandonment to the owner of a wind energy system that is deemed to be abandoned, and in cases where immediate safety is not of concern, the owner shall have 30 days from Notice receipt date to respond.
 2. Following the 30-day response period, and if the Zoning Administrator determines that the system remains abandoned, the owner of the system shall remove the abandoned system at their expense within 180 days of the original Notice of Abandonment. A demolition permit shall be obtained for the removal of the abandoned system.
 3. Failure to remove the abandoned system within said 180 days constitutes a violation of this Section. Following said 180 days, the City, or a contractor hired by the City, shall have the authority to enter the subject property and cause removal of the system at the owner's expense. In the case of such removal the City may file a lien for reimbursement, of any and all expenses incurred by the City without limitation, including attorney fees and accrued interest. For those cases in which the owner of a wind energy system is not the owner of land on which the system is located, the City may execute the bond posted at the time of approval of the system.
- N. *Pre-Existing Wind Energy Systems*

1. Pre-existing wind energy systems shall be allowed to continue. Routine maintenance shall be permitted on such pre-existing systems.
2. A building permit and any other necessary zoning and development approvals shall be obtained to alter, enlarge, extend, replace or relocate a pre-existing wind energy system.
3. If a pre-existing wind energy system is nonconforming with this Section, it shall not be altered, enlarged, extended or relocated such that the nonconformity of the system is increased.
4. Pre-existing wind energy systems that are substantially damaged or destroyed must be rebuilt to conform with this Section.

Section 2. The City Clerk is directed to publish this Ordinance in pamphlet form by authority of the corporate authorities.

Section 3. This Ordinance shall be in full force and effect from and after its passage and publication in accordance with the terms of Chapter 65, Section 1-2-4 of the Illinois Compiled Statutes (65 ILCS 5/1-2-4).

This Ordinance is hereby passed by the affirmative vote, the "ayes" and "nays" being called of a majority of the members of the City Council of the City of Urbana, Illinois, at a regular meeting of said Council on the ____ day of _____, 2010.

PASSED by the City Council this ____ day of _____, 2010.

AYES:

NAYS:

ABSTAINED:

Phyllis D. Clark, City Clerk

APPROVED by the Mayor this _____ day of _____, 2010.

Laurel Lunt Prussing, Mayor

CERTIFICATE OF PUBLICATION IN PAMPHLET FORM

I, Phyllis D. Clark, certify that I am the duly elected and acting Municipal Clerk of the City of Urbana, Champaign County, Illinois. I certify that on the ____ day of _____, 2010, the corporate authorities of the City of Urbana passed and approved Ordinance No. _____, entitled "AN ORDINANCE APPROVING A TEXT AMENDMENT TO THE ZONING ORDINANCE OF THE CITY OF URBANA, ILLINOIS (Enacting Section XIII-7, "Wind Energy Systems" - Plan Case No. 2115-T-09) which provided by its terms that it should be published in pamphlet form. The pamphlet form of Ordinance No. _____ was prepared, and a copy of such Ordinance was posted in the Urbana City Building commencing on the ____ day of _____, 2010, and continuing for at least ten (10) days thereafter. Copies of such Ordinance were also available for public inspection upon request at the Office of the City Clerk.

DATED at Urbana, Illinois, this ____ day of _____, 2010.

(SEAL)

Phyllis D. Clark, City Clerk

Counties with Wind Ordinances	Permit/Application Process	Design								Set-Backs				Standards						
		Safety/ Certification	Controls/ Brakes	Electrical Components	Lighting	Color	Federal Aviation Administration Compliance	Warnings/Signs	Climb Prevention	Primary Structures	Roads/ towers	Incorporated Area	Property Lines	Public Road Use	Maintenance/ Operation	Noise	Birds	Liability Insurance	Decommissioning Plan	Small Turbines
Bureau	No Data																			
Carroll	√	√	√	√		√	√	√	√	1.1x	1.1x/1.25x		1.1x	√	√	√		√	√	
Champaign	Refer to Heavy Industry (I-2) for zoning requirements																			
Coles	√	√	√	√	√		√	√	√	1400*	1.1x	1500ft	1.1x	√	√	√			√	
Ford	√	√	√	√	√	√	√	√	√	1000ft	1.1x	1500ft	1.0x	√	√	√	√	√	√	
Henry	√			√	√	√	√	√	√		1000ft/1.1x		100ft tip	√			√		√	
Iroquois	√	√	√	√		√	√	√	√	1.1x	1.1x		1.1x	√	√	√	√	√	√	
Jo Daviees	√	√	√	√		√	√	√	√	1400ft	1.1x		1.1x	√	√	√	√	√	√	
Kendall		√	√	√	√		√	√	√		1.5x		1.5x	√		√	√		√	
Knox	√			√	√	√	√	√	√		1.1x		1000ft	√		√	√		√	
La Salle	√	√	√		√	√	√	√	√	750ft	1.1x/1.25x		1.1x	√		√			√	
Lake	Refer to AG, RE, E for Zoning requirements																			
Lee	√	√	√				√	√	√		350ft/350ft		350ft		√	√				
Livingston	√	√	√	√	√	√	√	√	√	3x or 1200ft	1.1x/1.1x	1.5miles	1.1x	√	√	√	√	√	√	
Macon	No Data																			
Marshall	√	√	√	√	√	√	√	√	√	1000 ft	1.0x		1.0x	√	√	√	√		√	
Mercer	No Data																			
McLean		√			√		√						***							
Moultrie	√	√	√	√	√		√	√	√	1400*	1.1x	1500 ft	1.1x	√	√	√			√	
Ogle	Refer to Ag-1 for Special Use zoning requirements																			
Peoria		√	√		√	√	√	√	√	1.1x	1.1x		750ft	√	√	√	√	√	√	
Rock Island	√			√	√	√	√	√	√	1.1x	1.1x		100ft tip	√		√	√		√	
Sangamon	√	√	√	√	√	√	√	√	√	1200 ft	1.1x/3x**	1.5 miles		√		√			√	
Shelby	√	√	√	√	√		√	√	√	1.1x	1.1x		1.1x	√	√	√			√	
Stark	√									1000ft	1.1x		1.0x	√					√	
Stephenson	√	√	√	√		√	√	√	√	1.1x	1.1x		1.1x	√	√	√	√	√	√	
Tazwell		√	√	√	√	√	√	√	√	1.1x	1.1x		1.1x	√	√	√	√	√	√	
Warren	corrupted copy, requesting new one																			
Whiteside	No Data																			
Woodford	√	√	√	√	√	√	√	√	√		1.1x		1.1x	√	√	√	√	√	√	

* 1.0MW or less shall be 1,000 feet or more from any existing or occupied residence. Greater than 1.0MW, setback is 1400 ft

** 3x rotor diameter or 1000 feet, whichever is greater

*** wind facilities shall not be located within 2000 feet of a boundry line of an R-1 or R-2 district

MINUTES OF A REGULAR MEETING

URBANA PLAN COMMISSION

APPROVED

DATE: August 5, 2010

TIME: 7:30 P.M.

PLACE: Urbana City Building – City Council Chambers
400 South Vine Street
Urbana, IL 61801

MEMBERS PRESENT: Jane Burris, Andrew Fell, Tyler Fitch, Dannie Otto, Michael Pollock, Marilyn Upah-Bant

MEMBERS EXCUSED: Ben Grosser, Lew Hopkins, Bernadine Stake

STAFF PRESENT: Robert Myers, Planning Manager; Lisa Karcher, Planner II; Jeff Engstrom, Planner I; Teri Andel, Planning Secretary

OTHERS PRESENT: Billy Aceto, Jeffery Branson, Randy Brown, Leslie Cotton, Chris Doxtator, John and Dora Grubb, Jim and Shirley Howe, Drew Kenna, Thomas Martin, Chad and Sara May, Helen Miron, David and Brenda Rogers, Emily Sims

NEW PUBLIC HEARINGS

Plan Case No. 2115-T-09: A request by the Urbana Zoning Administrator to amend the Urbana Zoning Ordinance by adding Section XIII-7, Wind Energy Systems, to regulate the construction and operation of wind energy systems in the City and within its 1½ -mile extra-territorial jurisdiction.

Chair Pollock suggested that the Plan Commission move this item to Staff Report since they just received the written staff report. Planning staff intends to give a presentation but recommends that the case be continued to the next scheduled meeting. The Plan Commission members agreed to move this item to Staff Report.

STAFF REPORT

Plan Case No. 2115-T-09: A request by the Urbana Zoning Administrator to amend the Urbana Zoning Ordinance by adding Section XIII-7, Wind Energy Systems, to regulate the construction and operation of wind energy systems in the City and within its 1½ -mile extra-territorial jurisdiction.

Lisa Karcher, Planner II, presented the proposed text amendment to the Urbana Plan Commission. She gave a brief summary of the written staff report that was handed out prior to the start of the meeting. The purpose of the proposed regulations is for effective and efficient use of wind resources while protecting the public health, safety and welfare. The regulations are being proposed in response to language in the 2005 Urbana Comprehensive Plan about using wind and solar resources. In addition, the City has been getting public interest in installing smaller units on their properties to reduce their energy costs, and the University of Illinois is planning to do a wind turbine development south of Urbana.

She mentioned that Champaign County has adopted wind regulations already. If someone wanted to build a wind turbine within the City limits, it would currently be reviewed as a utility. Since the State of Illinois allows municipalities to regulate wind turbines within city limits as well as within the Extra-Territorial Jurisdiction (ETJ) area surrounding the city, there is a gap between the County and the City in the ETJ where there are no regulations.

Ms. Karcher then discussed the following about wind turbines:

Basic Information Concerning Wind Energy:

- Wind Turbine Types
 - Building Mounted
 - Tower Mounted
 - Vertical Axis
- Wind Turbine Size
 - Small Wind Turbines
 - Wind energy conversion systems (WECS)
 - Rated 100 kW or less (70 foot rotor diameter or less)
 - Primarily used to power homes, farms, small businesses and schools
 - Large Wind Turbines
 - Rated over 100 kW (greater than 70 feet rotor diameter)
 - Primarily used to power large farms, businesses, industries and wind farms
- Wind Turbine Energy Production
 - Engineering design of the wind turbine
 - Size of the turbine rotor
 - Speed and consistency of wind
- Common Concerns
 - Safety
 - Noise
 - Shadow Flicker
 - Aesthetics/Appearance

Proposed Regulations

- Turbine Classification
 - Anemometer Tower
 - Building-Mounted Wind Energy System
 - On-Site Tower-Mounted Wind Energy System

- Residential Service Area Wind Energy System
- Utility Tower-Mounted Wind Energy System
- Design Standards
 - Visual Appearance
 - Tower Type
 - Color
 - Lighting
 - Signs
 - Electrical System
 - Nothing unrelated allowed to be attached
- Safety
 - Tower access
 - Equipment access
 - Ground Clearance
 - Overspeed Controls
 - Force Wind Standards
 - Electromagnetic Standards
- Vibration
- Sound Level Limit
- Shadow Flicker
- Federal Aviation Administration Compliance
- Industry Standards
- Other Requirements
 - Code Compliance
 - Maintenance
 - Violation
 - Abandonment and Removal
 - Pre-Existing Wind Systems

Chair Pollock asked that with any tower, whether it is a wind tower or cellular tower, if there was a formula to figure the angles of the guide wires, which dictates the size of the land needed. Ms. Karcher said that is correct. She noted that guide wires take up a huge amount of area outside of the height of a tower. Therefore, City staff is proposing to limit the type of tower allowed in the City's residential and commercial zoning districts to monopole-type towers.

Chair Pollock questioned whether every wind turbine is required to have guide wires. Ms. Karcher said no. Monopole wind turbines are not required to have guide wires, and the diameter of the monopoles are larger than the Council Chambers.

Mr. Fell asked if a person could put a wind turbine system on top of their home. Ms. Karcher stated yes. The proposed regulations state that it could not be taller than ten feet from the highest point of the building. Chair Pollock inquired if the ten feet includes the post and the top of the blade when it is pointing up. Ms. Karcher said yes.

Mr. Fell commented that a person could build a roof with a peak of 50 feet. Ms. Karcher mentioned that City staff had this discussion and found it difficult to regulate this because the way

we measure the height of a roof is not at the top. She tried to adjust the language to state that a wind turbine could not go over a certain percent of the maximum height, but the language did not translate well. She is open for suggestions on how to write language regarding this issue.

Mr. Otto expressed concern about allowing a 10-foot rotor diameter on a wind turbine that can only be ten feet from the highest point of the roof in residential zoning districts. Ms. Karcher replied that some of the turbines are in circular casings. City staff had talked about allowing up to 15 feet from the highest point of the roof, but they found some interesting things happening in other cities where a person had taken a tower-mounted turbine and placed it on top of a house. So, they are trying to limit certain types of wind turbines to be mounted on homes.

Chair Pollock inquired about anemometers and where they would be located. Ms. Karcher explained that anemometers are placed on towers. An anemometer is not as heavy as a wind turbine because it is basically a measuring device that has an eye that rolls around. Anemometers are up from a year to three years. They must be up for at least a year because the wind speed changes throughout the year due to temperature and geographical location. Larger wind farms would keep an anemometer up for a longer period of time.

Ms. Upah-Bant wondered how the wind speed varies. Is it within so many feet? Ms. Karcher replied that because wind is dependent upon turbulence, wind speed has a lot to do with the terrain and what is surrounding a wind turbine system. The wind speed increases as it gets higher.

Ms. Upah-Bant asked if it would be feasible to make wind turbines available to residents to install within City limits. Ms. Karcher responded by saying that for anyone who lives in the core of the City of Urbana where there are a lot of trees, it would not be feasible. City staff is proposing that the minimum required setback be equal to the height of the tower, so most of the residential lots in the City of Urbana are not big enough. The current minimum lot size requirement for most residential lots in the City of Urbana is 6,000 square feet. So, let us say that is 60' x 100', which means there could never be a tower taller than 30 feet high. With the trees and buildings, a person would never get a payback like they would want.

This is another reason why City staff is proposing to allow the vertical wind turbines. Although it would still be hard when surrounded by trees and buildings to get a payback on the wind turbine, vertical wind turbines can withstand turbulence and are more efficient.

Chair Pollock asked why City staff limited the number of vertical wind turbines that could be placed on a single home. Ms. Karcher explained that City staff had a discussion on this, and it is an issue that is very difficult to come to an agreement on. Mr. Fell recommended that they allow apartment buildings to have more than just one wind energy system because they are usually larger in size than a house.

Mr. Otto recommended that City staff allow non-residential uses to be able to have as many building-mounted wind energy systems as the property owners want. Ms. Karcher stated that they do not limit the number of wind energy systems for commercial and industrial uses. Other uses are limited by a separation requirement, which is that wind energy systems must be separated by the height of the tallest unit.

Mr. Otto remarked that there is a height limit restricting the wind energy systems to 15 feet above the roof. Businesses like O'Brien Auto Park and Farm & Fleet should be allowed to build higher wind systems.

Ms. Burris questioned whether it should be considered a building-mounted wind energy system if the system is coming up out of a building. Ms. Karcher explained that a building-mounted wind energy system must be mounted on a building. City staff would interpret this to mean that a unit is physically mounted on a building and not necessarily coming up through the building.

Ms. Karcher believes it will be harder for business owners to construct the larger wind turbines. Mr. Otto stated that technology is changing rapidly. The City might as well make it easier for business owners to build wind energy systems up to maximum efficiency. Let the business owners worry about how the systems are mounted and how they transfer the weight of a wind unit. They cannot be any uglier than they are without anything sticking out of them.

Mr. Fitch inquired about whether owners of property in design review districts and historic neighborhood districts would be allowed to install wind energy systems. Robert Myers, Planning Manager, responded by saying that wind energy systems on historic properties are covered in the Historic Preservation Ordinance. Mr. Fitch recommended adding language for design review districts.

Mr. Fell asked if the heights and distances from residential in the ETJ take into account what the shadow flicker does. He sees shadow flicker as being one of the biggest complaints coming from wind turbine developments. Ms. Karcher answered by saying that for smaller wind turbines, shadow flicker would not be a concern. However, for the larger units, shadow flicker would be reviewed.

Mr. Fell wondered if the wind energy systems would be far enough away from residential areas that shadow flicker would not be a problem. He does not know how to mitigate it once it becomes a problem. Ms. Karcher did not think the required distance from a residential area would be enough to completely negate shadow flicker on the residential area. Even a 30-foot tower will have shadow flicker on the surrounding neighbors at some point in time. The issue is how do they figure what would be a significant distance. People have varying opinions on what that impact is.

She mentioned that one of the problems with writing these standards is that there are regulations that have been worked through for large wind turbines. However, there are not many standards for small wind systems because the concept of using them in residential areas is relatively new. Every community she has contacted about small wind standards has different regulations and reasons. Mr. Myers pointed out that if we set standards, for example, that a wind energy system can have a maximum of 30 hours of shadow flicker on a neighboring property per year, how would a person measure this or enforce it. So, for larger wind systems, the City is recommending that the developers perform more studies to determine how many hours of shadow flicker will be caused by certain units.

Ms. Burris questioned whether there are health issues associated with shadow flicker. Ms. Karcher noted that there are all kinds of studies. Some studies say that shadow flicker should not cause health issues, but then some people say that it has.

Ms. Karcher talked about the standards being proposed for multiple neighbors to come together and install one wind energy system and for a developer building a subdivision to install wind units. Mr. Otto commented that he likes this concept.

Chair Pollock asked if someone who owns a cellular tower wanted to add a wind turbine unit, would this be possible. Ms. Karcher replied that the proposed text amendment would not allow anything to be added to a wind energy system tower, so she would think that a wind energy system would not be allowed on another type of tower as well.

Chair Pollock wondered where the University zoning district comes from. Ms. Karcher explained that Mr. Myers is working on getting this accomplished. Mr. Myers explained that he is looking into splitting the CRE, Conservation-Recreation-Education, Zoning District. Parks are now lumped into schools, and the standards are vastly different in terms of open space, etc. One of the new districts would be a University Zoning District. Chair Pollock suggested that unless City staff is prepared to define this in the proposed text amendment, then they may rethink including language regarding the University Zoning District.

Mr. Otto asked if the industry has a set of standards. Ms. Karcher said that small wind does not have set standards. Large wind turbines have some set standards. The industry standards that City staff has stated are the National Institute standards and the Underwriter's Laboratories standards. They are hoping that there will be a certification process in the future.

Chair Pollock remarked that Ms. Karcher is an expert in wind turbines. He thanked her for the work she put into the proposed text amendment.

Mr. Myers talked about the City staff's overall philosophy, which is that the big wind farms do not belong within the City of Urbana or in the ETJ. They belong in the far rural areas. They seem incompatible with urban uses.

They provided standards for wind energy systems that are allowed by right (building-mounted and tower-mounted units). The large units and units where the owners sell energy to others are by special use permit review and approval.

Chair Pollock feels that if a unit produces more energy than an owner uses for their home, there should be a regular procedure where they can sell the energy back to the utility company. He wants to make sure that this remains an option for all types of wind energy systems. Ms. Karcher responded by saying it is proposed in the text amendment that owners can sell back energy to the utilities or reduce their cost of electric by overage. Mr. Myers commented that the towers built to sell energy to other entities is a whole different dynamic of a land use.

Ms. Upah-Bant asked how the proposed text amendment compares to the County Ordinance regarding wind turbine regulations. Ms. Karcher stated that there are similarities and some

August 5, 2010

differences. She can make a chart or summary sheet show this information. Our philosophy is different than both Champaign County and the City of Champaign, so there will be some differences in the ordinances.

Chair Pollock continued this case to the next scheduled meeting.

MINUTES OF A REGULAR MEETING

URBANA PLAN COMMISSION

APPROVED

DATE: August 19, 2010

TIME: 7:30 P.M.

PLACE: Urbana City Building – City Council Chambers
400 South Vine Street
Urbana, IL 61801

MEMBERS PRESENT: Jane Burris, Lew Hopkins, Dannie Otto, Michael Pollock,
Bernadine Stake, Marilyn Upah-Bant

MEMBERS EXCUSED: Andrew Fell, Tyler Fitch, Ben Grosser

STAFF PRESENT: Lisa Karcher, Planner II; Jeff Engstrom, Planner I; Teri Andel,
Planning Secretary

OTHERS PRESENT: Susan Taylor

CONTINUED PUBLIC HEARINGS

Plan Case No. 2115-T-09: A request by the Urbana Zoning Administrator to amend the Urbana Zoning Ordinance by adding Section XIII-7, Wind Energy Systems, to regulate the construction and operation of wind energy systems in the City and within its 1½-mile extra-territorial jurisdiction.

Chair Pollock reopened this case. Lisa Karcher, Planner II, presented a brief summary of the proposed text amendment. She reviewed the questions and concerns that the Plan Commission had at the previous meeting. They were as follows:

1. *Why is the City limiting multi-family residential to one wind turbine?* She explained that there does not have to be a limit. For instance the Commission could choose to recommend standards so that non-single-family residential could have more than one wind turbine.
2. *Why is the City limiting the height on roof-mounted wind turbines if it meets the safety, etc.?* As long as they met safety standards the City could allow the height in commercial and industrial uses.
3. *Why is the City prohibiting telecommunications antennas from being attached to wind turbine towers?* After further review of the telecommunications section in the Zoning Ordinance, it states that the City's policy is to favor co-location. City staff could strike the language in the proposed text amendment prohibiting co-location on

wind turbine towers. However, wind turbine companies may not want to co-locate on their towers due to maintenance or the actual functioning of the wind turbines.

4. *References to University zoning district.* City staff is working on creating a University Zoning District. However, we could remove the language referring to this district until it has actually been adopted.
5. *Does shadow flicker cause epileptic seizures?* She reviewed a study that shows that the frequency or revolutions per minute that a wind turbine turns does not create seizures.
6. *Houses constructed close to existing wind turbine and making the turbines nonconforming.* Ms. Karcher spoke with John Hall, Planning and Zoning Director at Champaign County. He pointed out that this does not matter in the City of Urbana because although Champaign County's wind turbine standards are based on distances from dwellings, the City's setback standards are based on the distances to property lines. So construction of a house would not trigger any nonconforming status for existing wind turbines.
7. *What standards would be used to review wind turbines being installed in the City's design review districts?* The only districts that would be impacted by review requirements for wind turbine developments would be City-designated historic landmarks and districts. Wind turbine developments would not trigger review in the Lincoln-Busey Corridor, East Urbana Design Review District, or in the MOR Zoning District. Design guidelines in these districts are triggered by building construction which is intended to insure that existing and new buildings are compatible.

Ms. Karcher stated that these concerns can be addressed in the proposed ordinance however the Plan Commission desires.

Ms. Burris commented that certain neighborhoods applied for design review to keep the neighborhoods the same. Putting a wind turbine in the neighborhood could change the character of the neighborhood significantly. Ms. Karcher replied that essentially the design guidelines that are in place are to ensure that the single-family nature of the neighborhoods are preserved.

Ms. Burris said she would agree with this if there were not rules about the type of roof, the type of windows, etc. If it would just be a matter of residential homes remaining residential homes and not being demolished and redeveloped as multi-family units, then Ms. Karcher's statement would be true. However, there are design guidelines for the actual features of the homes in these districts, so placing a wind turbine on the roof or in the yard will have an effect on the character of a neighborhood.

Chair Pollock noted that East Urbana residents stated during the East Urbana design review public hearing that they know that development is needed and expected and they are not opposed it. They just wanted to make sure that something is not built that would wreck the neighborhood. The Lincoln-Busey Corridor Design Review guidelines are stricter though. So, it may be necessary to address the guidelines for this district to make sure that wind turbines are not something that should trigger review.

Ms. Stake wondered if there are any communities that allow residential turbines. Ms. Karcher answered that wind energy is not new but that technology now allows wind turbines in residential areas. Currently some residential wind turbines are located in the extra territorial

jurisdiction (ETJ) area around Urbana. However, there is a cost involved in installing a wind turbine unit, and the payback takes time -- 10 to 15 years. Therefore, she doesn't believe there will be many people installing a wind turbine system. They will also need to have access to sufficient wind flow to make it possible. So the cost of installing a wind turbine system and the return on investment will be weighed. The City of Urbana is fortunate to have great tree cover. But that also makes wind turbine use in the city more costly because they have to be installed higher than the 60-foot tall tree cover.

Ms. Stake expressed concern about the noise level if every property owner on a street installed wind turbine systems. Ms. Karcher said this was something discussed by City staff. That's why each wind turbine is required to meet a noise level at the property line.

Mr. Otto pointed out that the chart on Page 6 of the written staff report dated August 2, 2010 compares the noise level of different situations and activities. He doesn't feel that a wind turbine system would be any louder or noisier than a window air conditioner. A property owner might have several window air conditioners going at one time, and we do not have a right to tell our neighbors that their air conditioners are too loud. So he suspects that while the noise emitted from a wind turbine system maybe noticeable, it is certainly a noise that people can live with. Ms. Karcher commented that shadow flicker and noise are somewhat subjective in that what one person considers noise may not be noise to someone else. Most communities follow the Illinois Pollution Control Board's standards for wind turbine noise. The language in the proposed text amendment ordinance is modeled after these standards, but it is actually stricter. Some other communities not following the Illinois Pollution Control Board standards set a decibel level at the property line. She has seen it be as low as 40 decibels and as high as 65 decibels.

Ms. Stake asked if there are any homeowners who have wind turbine systems already. Ms. Karcher replied that there are at least two in the ETJ area. She does not know of any actually in the City of Urbana.

Ms. Upah-Bant questioned whether property owners could install satellite dishes if they wanted in the design review and MOR districts. Ms. Karcher said yes. Design review is triggered by new construction or alteration of a principle structure. Ms. Upah-Bant wondered if installing a satellite dish would require a permit. Ms. Karcher did not believe so.

Ms. Upah-Bant noticed that the proposed text amendment did not have a definition for "wind turbine". What is the difference between a wind turbine and an old-fashioned windmill? If she wanted to install a traditional windmill, would it be subject to these same constraints? Ms. Karcher responded that if a person installed a windmill for aesthetic reasons then it would not be reviewed under the proposed standards. If a person installs a windmill to produce electricity, then there would be review to make sure that it is safe and meets the standards.

Mr. Hopkins wondered what is a "development" and what is a "system". Why do we care how many there are per property? Ms. Karcher stated that "system" is short for any individual wind energy system. "Development" is more than one system in one place. She noted that some communities do not have a limit on the number of systems on one property because a property owner is restricted by lot size as well as noise and shadow flicker requirements. This is an issue that is up for discussion.

Mr. Hopkins pointed out that a vertical axis system can be within 10 feet from the ground. Many people can dunk a basketball in a goal at 10 feet 6 inches, so this strikes him as being potentially problematic. Ms. Karcher mentioned that this is a standard she found in reviewing different ordinances and documents. The purpose is that most of the vertical axis systems are shorter because wind turbulence does not affect them like a horizontal axis. People use vertical axis systems to cut down on costs. If the City feels like 10 feet is too low or there is a danger then a higher height can be required.

Chair Pollock recapped that a vertical system does not have big blades. Ms. Karcher described it as being like an egg beater. She referred to page 2 of the August 2 staff memorandum. The picture on the bottom left hand corner shows a vertical axis system. She explained that a person may need more than one vertical axis system because they do not create as much energy.

Mr. Hopkins noted that there is a residential service area option but not a commercial service area option. Ms. Karcher stated that utility tower mounted systems are restricted to AG (Agriculture) and IN (Industrial) zoning districts. At the previous meeting, the Plan Commission discussed allowing utility tower-mounted systems in the commercial zoning districts as well. By allowing utility-mounted wind towers in the commercial areas, we allow very large wind turbines. In looking at the Urbana zoning map and where our business districts are located and their size, the utility-mounted towers would be limited. Mr. Hopkins clarified that he is against expanding utility-mounted towers to commercial areas, but he is in favor of providing a commercial service area option.

Mr. Hopkins asked Ms. Karcher to identify key differences between the City of Champaign's wind turbine ordinance and the proposed text amendment. Ms. Karcher mentioned that it is hard to compare the two because the two cities look at things differently. But in residential districts, the City of Champaign allows a maximum height of 100 feet and a rotor diameter of 50 feet, while Urbana's could allow 120 feet in height and 30 feet in rotor diameter as long as it meets setback requirements. Another difference is that the City of Champaign allows towers in non-residential districts, and over 1,000 feet from residential, to build a 175 foot tower with a rotor diameter of 100 feet. Urbana would similarly allow a maximum 175 foot height but has a maximum rotor diameter of 70 feet. In Champaign, a special use permit can allow systems taller than 175 feet in commercial and industrial zoning districts. In Urbana, the districts for taller systems would be limited to AG, IN, and CRE. So as far as standards the differences between Champaign's and Urbana's standards would be districts allowed as well as maximum height and rotor diameter.

Mr. Hopkins inquired about how the City of Champaign's ordinance deals with wind turbine noise. Ms. Karcher answered that the Champaign's noise level is based on the Illinois Pollution Control Board's standards. Urbana's draft ordinance is stricter in one regard because in addition to looking at the decibel level, City staff is proposing to limit low frequency noise as well. She commented that to some extent this will be a learning experience because not enough turbines are yet in place to understand their impacts. Over time the City may need to amend its ordinance to deal with what is being encountered.

Mr. Hopkins asked whether the City of Urbana has sound regulations on anything else. Ms. Karcher responded that there are noise standards in the City Code (Chapter 16). It basically deals with "nuisance noise." The City's Legal Department plans to work on a noise ordinance

because the issue has come up with different commercial development. In cases of industrial and commercial, the City follows the Illinois Pollution Control Board's standards.

Mr. Hopkins wondered how the proposed ordinance might affect the University's wind turbine proposal. Is the inclusion of the University District, even though it does not yet exist, matter to the University of Illinois' proposal? Ms. Karcher explained that the reason for including the University Zoning District reference would be to allow them to operate wind turbines on properties annexed in the City and zoned University Zoning District. City staff is looking towards the future.

With no further questions from the Urbana Plan Commission for City staff, Chair Pollock opened the meeting to public input. No one indicated they wished to provide comments. Chair Pollock then closed the public input portion of the meeting and opened the meeting to Plan Commission discussion and/or motion(s).

Chair Pollock summarized the questions and issues raised by the Plan Commission.

Ms. Karcher then addressed issues raised in the email from Paul Debevec distributed tonight to Commissioners. The first issue concerns setback requirements. Ms. Karcher explained that the proposed text amendment requires a setback equal to the height of a tower. Under state law municipalities cannot require setbacks from the user's property line greater than 1.1 times the height of the system. The second concern is about the proposed noise level. Ms. Karcher recapped that the draft ordinance follows the Illinois Pollution Control Board's standards, which is what is required of any other noise producer in the city. The Plan Commission has the option to change this if they so desire. The third concern deals with maintenance. Ms. Karcher stated that maintenance is indeed a big issue. A person cannot install a wind turbine and expect to have no maintenance. A lack of maintenance will cause increasing noise over time. Maintenance standards are included in Section K (page 8). Enforcement would be on a complaint basis.

Mr. Otto asked how well the Illinois Pollution Control Board standards are kept up-to-date in terms of latest technology. If we generally refer to their standards for noise level will our regulations become outdated as technology changes? Ms. Karcher said that City staff will have to do further research. She does not know enough about the Illinois Pollution Control Board's process to answer this question.

Mr. Otto asked if noise standards are always based on the manufacturer's laboratory testing. Ms. Karcher replied that part of the problem is that the wind energy systems are new enough that there are not any noise ratings or standards. In time there will be some organization that will review and set up standards. We are starting to see noise or sound ratings being placed on wind turbines, but not all of them have it yet. It then becomes a question of what standards are they using to rate the sound level. Champaign County decided to make it a requirement for people to purchase wind turbines that have specific ratings on them. This is how they document that the wind turbines meet their standards.

Mr. Otto commented that a person may be permitted to install a wind turbine system, the City measures the noise level with a decibel meter and then tells the person whether he/she can keep the wind turbine or take it down. Ms. Karcher agreed that essentially it becomes an after-the-fact code compliance.

Chair Pollock asked the Plan Commission members how they wished to proceed. Mr. Hopkins stated that he did not think the proposed text amendment was close enough to be written in commission meetings. He suggested that they identify a set of requested changes for City staff.

Chair Pollock then summarized the following as discussed tonight.

1. *Limits on the number of wind turbines allowed on buildings.* The Plan Commission agreed that there should not be any limits on the number of wind energy systems per building or per development in any zoning district.
2. *Allow co-locations of other utilities on wind turbine towers.* The Plan Commission agreed that they should allow placement of telecommunications equipment on wind turbines as long as it is safe.
3. *Remove the reference to University Zoning District from the proposed text amendment.* The Plan Commission agreed that it should be removed until such time that a University Zoning District classification exists.
4. *Define wind energy production.* Mr. Otto pointed out that “wind energy system” is already defined on page 2 of the proposed ordinance. Mr. Hopkins noticed that the definition left out direct mechanical pumping; however, he realizes that most wind energy systems are used to generate electricity. So, there was no change to the definition.
5. *Add a commercial service area option?* The Commission agreed that City staff should add a commercial service area option for commercial, industrial and agricultural zones and keep it distinct from utility-tower mounted systems to limit the size of the towers.
6. *Reference to Illinois Pollution Control Board’s standards.* The proposed text amendment is stricter than what is required by the Illinois Pollution Control Board. City staff should research the Illinois Pollution Control Board’s procedures to see if their standards are updated as new technology is discovered.
7. *Debevec Email.* Chair Pollock remarked that he is comfortable with Ms. Karcher’s response. The Plan Commission agreed.
8. *Design Review Districts.* Ms. Karcher stated that City staff will discuss this issue and bring back a recommendation at the next scheduled meeting.

With no further discussion, Chair Pollock continued this case to the next scheduled meeting.

MINUTES OF A REGULAR MEETING

URBANA PLAN COMMISSION

DRAFT

DATE: September 9, 2010

TIME: 7:30 P.M.

PLACE: Urbana City Building – City Council Chambers
400 South Vine Street
Urbana, IL 61801

MEMBERS PRESENT: Andrew Fell, Tyler Fitch, Lew Hopkins, Dannie Otto, Michael Pollock, Bernadine Stake

MEMBERS EXCUSED: Jane Burris, Ben Grosser, Marilyn Upah-Bant

STAFF PRESENT: Robert Myers, Planning Manager; Rebecca Bird, Planner I; Teri Andel, Planning Secretary

OTHERS PRESENT: Susan Taylor

CONTINUED PUBLIC HEARINGS

Plan Case No. 2115-T-09: A request by the Urbana Zoning Administrator to amend the Urbana Zoning Ordinance by adding Section XIII-7, Wind Energy Systems, to regulate the construction and operation of wind energy systems in the City and within its 1½-mile extra-territorial jurisdiction.

Chair Pollock reopened this case. Robert Myers, Planning Manager, stated that the proposed draft ordinance in the packet reflects the changes requested at the previous Plan Commission meeting.

Mr. Hopkins stated that with the underlines and strikeouts on page 3 the changes proposed to Section D.1 a and b are unclear to him. Mr. Fitch commented that it will become one paragraph and read, “*Anemometer Towers*. An anemometer tower is permitted in all zoning districts as a temporary use for no more than eighteen (18) months. An extension of this time period, not to exceed an additional eighteen (18) months, may be granted at the discretion of the Zoning Administrator upon submittal and review of sufficient evidence to support the requested extension.” Mr. Myers agreed. The final version will not include the first period.

Ms. Stake wondered why design review wouldn’t be necessary for all residential areas? Mr. Myers stated that building mounted wind energy systems would likely trigger design review in non-historic design review districts. Design review for turbines can be tricky because the

existing design guidelines don't have specific standards for them. Plus there are so many technical aspects of locating a wind turbine that design review standards can't account for. He is not sure what design review in all residential zoning districts would accomplish. The design review districts in place are to address very specific concerns for small areas – for instance in East Urbana to insure new apartment construction is compatible with the predominant single-family character.

Ms. Stake remarked that there are residential areas like the West Urbana Neighborhood that are almost like the design review districts. Mr. Myers remarked that there is not currently design review for building additions in West Urbana. So why should the design of a wind turbine be reviewed if not for a building addition? It's not the policy of the City to have design review for the whole City. We just have certain districts for very specific reasons. However, if the Plan Commission believes it is really important to have design review for all wind turbines then that could be part of a recommendation to the City Council.

Mr. Otto commented that if the Plan Commission wanted to have design review for wind turbines in the whole City, then they would have to specify how a design review board would be constituted and what authority and guidelines they would have to have. There would need to be a process as well as the standards for design review. It should be done by a separate ordinance.

Chair Pollock suggested leaving discussion of this major change in policy for another time. At this time there is no mechanism to do a city-wide design review for anything including wind turbines.

Mr. Hopkins stated that from the comments on page 2 in the September 3 staff memo, a proposal for a wind turbine would trigger review for landmarks and in historic districts, and the design review district ordinances that would require review because it would require a building permit. There are no design review standards mentioned in the proposed text amendment ordinance.

Mr. Myers also added that the proposed wind ordinance itself provides certain design standards that all wind energy systems must meet with regard to color, monopole versus lattice, etc. However, a wind turbine application would not go before a design review board in order to interpret these standards. A proposal for a wind turbine either meets these standards or doesn't.

Mr. Hopkins asked what Mr. Myers meant in the written staff report by "For other design review districts ... building-mounted wind energy systems would likely require review and approval by the respective review body ...". Does City staff think that a proposal for a wind energy system would trigger the existing mechanisms? Mr. Myers answered that he understood the Plan Commission wanted to know if any recommendations should be made about turbines in design review districts. In these districts, review is generally triggered if you are building a new principle structure, modifying the footprint of a new principle structure, or increasing the floor area ratio of a principle structure. Chair Pollock commented that none of these would apply to a roof-mounted wind energy system. Mr. Myers said that it's very possible that a wind turbine would not trigger design review in those districts.

Mr. Hopkins pointed out that the ordinance under review doesn't have anything to do with design review. Our current system would still be in place with this ordinance. Historic buildings

and landmarks get reviewed when anything is done to them. The other districts it is a question of whether it meets certain criteria.

Ms. Stake asked why shadow flicker standards were taken out. Mr. Myers said that these standards were not taken out, but he has revised the definition of "shadow flicker." This has been defined as "*the repetitive oscillation of light and shadow casts when light passes through and is interrupted by moving and wind turbine blades.*" The nuisance having to do with shadow flicker has to do more with the repetitive oscillation between light and shadow than just a moving shadow. For instance the shadow of tree falling on your house moves with the sun, but that doesn't bother people. It's really the more rapid alternations between light and shadow which can be a nuisance.

Ms. Stake wondered how utility wind energy systems fit in. Mr. Myers explained that they would be allowed by a Special Use Permit in the IN (Industrial) and AG (Agricultural) Zoning Districts either in the City or in Champaign County unincorporated. It is also allowed by Special Use Permit in any CRE (Conservation-Recreation-Education) and any future University Zoning Districts.

Mr. Fitch wondered why city staff removed the limits on the number of wind energy turbines that could be allowed on buildings. Chair Pollock mentioned that it started out as a discussion about commercial buildings. The Plan Commission asked that the limit be removed because the idea is to encourage rather than discourage the developmental use of this type of technology.

Mr. Myers commented on a previous question about whether epileptic seizures are triggered by the rotation of turbine blades. After researching this issue more, he found that the blades of a wind turbine generally do not move fast enough to trigger an epileptic seizure. Epilepsy is triggered in a very small percentage of the population by light and dark alternating between 5 and 30 Hertz. That's similar to a strobe light. Wind turbines rotate from one-half to one-and-a-half Hertz. On larger systems which cast shadows farther, a blade makes the circuit no more than once per second.

He discussed the Illinois Pollution Control Board standards for wind turbines versus the proposed text amendment/ordinance. The proposed standards are a little more stringent than the Illinois Pollution Control Board standards. A question was asked at the previous meeting if the Board standards keep up with new technology. The Board last updated their noise standards in 2006. They use as a basis the land use classification adopted by the American Planning Association. However, the Board does not enforce their noise standards. They used to turn over violations to the Illinois Environmental Protection Agency (IEPA), but the IEPA no longer has a noise enforcement division. But a property owner or a municipality can bring a case to the Board for a determination with the applicant having to provide all the evidence.

With no further questions for City staff from the Plan Commission members, Chair Pollock opened the hearing up for public input. There was none, so Chair Pollock closed the public input portion of the hearing. He then opened the hearing for Plan Commission discussion and/or motion(s).

Mr. Hopkins moved that the Plan Commission forward Plan Case No. 2115-T-09 to the Urbana City Council with a recommendation for approval. Mr. Fitch seconded the motion.

Chair Pollock thanked Lisa Karcher for all the work she put into researching and creating the proposed text amendment. And he appreciated all of the revisions that were made.

Roll call on the motion was as follows:

Mr. Fitch	-	Yes	Mr. Hopkins	-	Yes
Mr. Otto	-	Yes	Mr. Pollock	-	Yes
Ms. Stake	-	Yes	Mr. Fell	-	Yes

The motion was passed by unanimous vote. Mr. Myers noted that there will be a public presentation at the Committee of the Whole meeting on Monday, September 13, 2010. City staff hopes this case will be forwarded to the City Council meeting scheduled for Monday, September 20, 2010.