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Wind Energy

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I. [18.1] INTRODUCTION

It is clear that the United States as well as other countries around the world will increasingly be using wind energy to generate electricity. It is a relatively low-cost form of energy and will certainly help alleviate this country's dependence on foreign oil. Current American wind farms generate just over one percent of U.S. electricity, powering the equivalent of over 4.5 million homes. However, that can be expected to grow over the next several years as the United States begins to realize wind energy's potential as a renewable energy source.

T. Boone Pickens, a billionaire and legend in the oil and gas business, has said that the United States is the Saudi Arabia of wind power. Pickens Plan (2008), available at www.pickensplan.com/theplan. He points out that 20 percent of America's electricity could come from wind. He further emphasizes that the development of wind power is an investment in America that holds the promise of creating high-skill jobs for thousands of Americans who would be employed in the manufacture of turbines and blades. A 2005 Stanford University study found that there is enough wind power worldwide to satisfy global demand seven times over — even if only 20 percent of wind power could actually be captured. Cristina L. Archer and Mark Z. Jacobson, *Evaluation of Global Wind Power*, available at www.stanford.edu/group/efmh/winds/2004jd005462.pdf. In 2008, American wind farms produced an estimated 48 billion kilowatt hours of energy. See the American Wind Energy Association's website at www.awea.org. The AWEA explains that one megawatt of electricity can power 250 to 300 homes. At the end of 2008, the power capacity was 1,000 megawatts in Illinois, with projects under construction that will provide an additional 171 megawatts. Illinois ranks eighth in the United States in wind existing capacity.

There is no question that wind energy will continue to be developed in the United States and that its growth and advancement will create jobs as well as an alternative and cheaper form of energy. For municipalities the issues become how it can be of benefit to the community and what the sources of local regulation are.

On one level, alternative forms of energy such as wind energy can reduce costs for municipalities in the same way that costs can be reduced for home owners and businesses. It simply becomes cheaper to operate provided there is a legal mechanism for offsetting the costs between the electricity provided in the traditional manner from a utility company and the electricity provided by wind energy. Utility companies themselves will benefit from wind energy by having an alternative source of power.

On another level, small wind turbines can directly benefit the home owner or business. In fact, small wind turbines were common on farms and ranches across the Midwestern United States before rural electrification programs. Wind generators power lights, radios, and kitchen appliances in rural areas. Further, small turbines contribute a larger public benefit by reducing demand on utility systems now supplied primarily by centralized fossil fuel plants. PERMITTING SMALL WIND TURBINES: A HANDBOOK, American Wind Energy Association's Small Wind Advocate Team (2003), available at www.awea.org/smallwind/documents/permitting.pdf. These rural systems are relatively small but come with a high return in energy production. Specifically, small turbines or small wind energy conversion systems are

variously described but generally consist of a wind turbine, one tower, support system, blades, associated controls, and conversion electronics. It has a rated capacity of 10 to 100 kilowatts and a height of 35 feet or more up to 100 or even 200 feet. Mini wind energy conversion systems are generally at a height of 35 feet or less and have a rated capacity of less than 10 kilowatts. See the Sangamon County Zoning Ordinance in §18.33 below.

II. DRAFTING A ZONING ORDINANCE

A. Legal Framework for Zoning Ordinance

1. [18.2] Zoning Enabling Statute

The zoning enabling statute, 65 ILCS 5/11-13-1, *et seq.*, generally provides for the authority of municipalities to regulate the height and bulk of buildings and other structures, to establish setback lines, and to generally divide the municipality into a variety of districts and shapes, thereby permitting different types of uses in different districts. 65 ILCS 5/11-13-1. There is no specific limitation on home-rule municipalities, but there is also no real distinction to be made between home rule and non-home-rule municipalities in regard to the authority to permit different types of buildings and structures within the municipality.

2. [18.3] Special Uses and Conditional Uses

Generally speaking, zoning ordinances that have been passed dealing with this subject have made the wind energy system a special or conditional use or have provided for site-specific requirements that would be in the nature of a special use. 65 ILCS 5/11-13-1.1. If done as a permitted use, then the specifications become extremely detailed.

3. [18.4] Municipality Wind Farm Regulations

A municipality may regulate wind farms and electric-generating wind devices within its zoning jurisdiction and within the 1.5 mile radius surrounding its zoning jurisdiction. There shall be at least one public hearing not more than 30 days prior to a siting decision by the corporate authorities of a municipality. Notice of the hearing shall be published in a newspaper of general circulation in the municipality. A municipality may allow test wind towers to be sited without formal approval by the corporate authorities of the municipality. Test wind towers must be dismantled within 3 years of installation. For the purposes of this Section, “test wind towers” are wind towers that are designed solely to collect wind generation data. 65 ILCS 5/11-13-26.

Pursuant to this statute, a municipality has the authority to regulate wind farms within its zoning jurisdiction and also within the 1.5-mile radius surrounding its zoning jurisdiction. This 1.5-mile area is the planning jurisdiction for a municipality, and the authority being given the municipality to regulate the siting of wind towers within that 1.5-mile radius is unique. 65 ILCS 5/11-12-5(1). This provision has not yet been interpreted by the courts so that there are certain

questions that need to be resolved. First, it seems clear that when the statute speaks about a municipality “regulating,” this requires that the municipality actually pass an ordinance to regulate. This does not simply allow for ad hoc hearings without any standards to determine whether a wind tower may be located in a given area.

In addition, it should be noted that a municipality, as part of its planning jurisdiction, does have the authority to lay out standards for subdivisions. 65 ILCS 5/11-12-8. Pursuant to this authority, municipalities pass subdivision ordinances and prepare official planning maps. The siting authority referenced in §11-13-26 is an extension of this authority. 65 ILCS 5/11-13-26. It should be noted that the planning authority for the municipality appears in Division 12, 65 ILCS 5/11-12-1, *et seq.*, of the Illinois Municipal Code, 65 ILCS 5/1-1-1, *et seq.*, whereas the zoning authority appears in Division 13, 65 ILCS 5/11-13-1, *et seq.* In any event, whether the regulation is part of a subdivision code or part of a zoning code, it is incorporated as part of a code. In other words, the regulation is part of a zoning ordinance or part of a subdivision ordinance or some combination thereof.

It should be noted that residents living outside the municipality who might choose to enter into an agreement with a wind farm developer are subject to obtaining approval from a village board or city council that they have no right to elect.

4. [18.5] County Wind Farm Regulations

A county may establish standards for wind farms and electric-generating wind devices. The standards may include, without limitation, the height of the devices and the number of devices that may be located within a geographic area. A county may also regulate the siting of wind farms and electric-generating wind devices in unincorporated areas of the county outside of the zoning jurisdiction of a municipality and the 1.5 mile radius surrounding the zoning jurisdiction of a municipality. There shall be at least one public hearing not more than 30 days prior to a siting decision by the county board. Notice of the hearing shall be published in a newspaper of general circulation in the county. Counties may allow test wind towers to be sited without formal approval by the county board. Any provision of a county zoning ordinance pertaining to wind farms that is in effect before the effective date of this amendatory Act of the 95th General Assembly may continue in effect notwithstanding any requirements of this Section.

A county may not require a wind tower or other renewable energy system that is used exclusively by an end user to be setback *more than 1.1 times the height of the renewable energy system from the end user’s property line.* [Emphasis added.] 55 ILCS 5/5-12020.

The statute authorizing the county to establish standards for wind farms and electric generating wind devices places a limitation on the county in that it specifically provides that the authority of the county board only extends to an area outside “of the zoning jurisdiction of a municipality and the 1.5 mile radius surrounding the zoning jurisdiction of a municipality.” This raises another novel question. If a municipality has not chosen to regulate the size, height, and

location of wind towers either through a zoning ordinance or subdivision code, then it would appear that the area extending to 1.5 miles outside the municipal boundaries and including the municipal boundaries is unregulated. This raises the issue of whether a property owner may just proceed to build a wind tower without seeking approval of either the county or the municipality. The developer would not seek approval of the county because the county's jurisdiction does not extend into the 1.5-mile radius surrounding the municipality, and it would not seek the approval of the municipality because the municipality has no law regulating wind farms. It is respectfully suggested to the framers of the legislation for both the county authority and the municipal authority that clarification is needed in regard to these laws.

One other limitation should be noted and that is the imposition of a limitation regarding setbacks of not more than 1.1 times the height of the renewable energy system from the end user's property line.

Both of these statutes need to be looked at in the context of the general zoning law within this state, which does not allow a lawful use to be totally prohibited from the jurisdiction of the governmental entity whether the county or the municipality.

B. Specific Zoning Provisions

1. [18.6] Wind Energy Conversion System

The wind energy conversion system (WECS) is the system by which wind energy is converted to electricity, including wind turbines, towers, support systems, blades, associated controls, and conversion electronics and that has a rated capacity over 100 kilowatts. See Sangamon County Zoning Ordinance §17.49.010 in §18.33 below.

2. [18.7] Small Wind Energy Conversion System

The small wind energy conversion system (SWECS) is the system by which wind energy is converted to electricity, including a wind turbine, one tower, support system, blades, associated controls, and conversion electronics and that has a rated capacity of 10 to 100 kilowatts or a system height of 35 feet or more. See Sangamon County Zoning Ordinance §17.49.010 in §18.33 below.

3. [18.8] Mini Wind Energy Conversion System

The mini wind energy conversion system (Mini WECS) is the system by which wind energy is converted to electricity, including a wind turbine, one tower, support system, blades and associated control, and conversion electronics and that has a rated capacity of less than 10 kilowatts and a system height of less than 35 feet. See Sangamon County Zoning Ordinance §17.49.010 in §18.33 below.

4. [18.9] Setback Requirements

Setback requirements include setbacks from adjacent property lines and overhead utility or transmission lines, as well as setbacks from other buildings or structures, with at least the maximum height or height plus ten percent. In the county, the setback is limited to not more than 1.1 times the height of the wind tower. 55 ILCS 5/5-12020.

5. [18.10] Noise Standards

The issue of noise is raised repeatedly in regard to the grant of special use or conditional-use permits for wind farms, and a typical standard is 50 decibels when measured at any residential, school, hospital, church, or public library building. See §18.22 below.

6. [18.11] Height Limitations

Especially insofar as there is an airport in the vicinity, there are height restrictions on wind farm developments. The Federal Aviation Administration has to approve the siting so there is no question of possible interference with the airport (499 feet in one ordinance). See 14 C.F.R. §77.23; McLean County Zoning Ordinance, ch. 40, art. 6, §41.E.

7. [18.12] Road Issues

The right of the developer to use existing roads would seem clear, but many communities require road maintenance agreements as part of the overall wind farm agreement so that roads are repaired at the expense of the developer following the construction of the wind farm. See the sample road maintenance agreement in §18.34 below.

8. [18.13] Interconnections

The wind energy conversion system developer has to provide for interconnections to an electric transmission grid, which might very well mean the electrical power lines exist along rights-of-way. This raises the separate issue of the right of the municipality to charge for the use of its rights-of-way. In this regard, see the Electricity Infrastructure and Maintenance Fee Law, 35 ILCS 645/5-1, *et seq.* The statute provides:

This law is intended to create a uniform system for the imposition and collection of fees associated with the privilege of using the public right of way for the delivery of electricity. 35 ILCS 645/5-2.

In addition, 35 ILCS 645/5-4 provides:

A municipality shall be entitled to require a franchise contract from an electricity deliverer as a condition of allowing the electricity deliverer to use any portion of any public right of way within the municipality for the placement and maintenance of facilities for distributing, transmitting, or delivering electricity. Such franchise contract shall be established by ordinance and shall be valid and accepted in writing by the electricity deliverer.

One of the issues to be considered is what is actually being approved by the municipality. Specifically, does the grant of a zoning permit also include the transmission lines and their location? In most cases, the plan for the development of the wind farm also includes the location of power lines to be run on private property for extended distances. For example, “such transmission lines and appurtenances may also be located on any other real property for which licenses, easements, leases, rights-of-way, or similar land rights have been obtained by developer.” (This is in addition to the public right-of-way.)

9. [18.14] Form of Application

When the approval is in the form of a conditional or special use permit, the application can be quite detailed. Generally speaking, it relates not just to the details of the project but also to the qualifications and experience of the developer. Usually the required site plan is similar to the type of site plan one might find for a planned unit development.

10. [18.15] Decommissioning

The issue of decommissioning has become an important one when negotiating an agreement with a developer. It involves removal of the turbines and equipment from the project site and restoring the site to its original condition. Generally, issues arise as to posting of a bond or letter of credit and how much of a bond or letter of credit has to be posted to assure the cost of the decommissioning. Many developers maintain that the projected salvage value of the turbines and other equipment exceeds the cost of the decommissioning. See the decommissioning plan in Sangamon County Zoning Ordinance §17.49.010.L in §18.33 below.

11. [18.16] Property Value Guarantee Agreement

If a property owner decides to sell property, an asking price should be determined by a qualified appraiser or an average of two appraisers. The property should be listed with a broker and sold within 180 days at the asking price. If not, then it should be sold for any bona fide offer, and the guarantor will make good the difference in the price. See §18.35 below for a sample property value guarantee agreement.

The concern that property values will be adversely affected by wind energy facilities is often made in wind siting cases. This concern is not unreasonable given that the effect of wind energy facilities on property values has not been thoroughly investigated. However, there is a study by the Lawrence Berkeley National Laboratory entitled “The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis” (Dec. 2009), available at <http://eetd.lbl.gov/ea/emp/reports/lbnl-2829e-ppt.pdf>, that concludes that neither a view of the wind facilities nor the distance of homes from those facilities has any consistent, measureable, or significant effect on the selling prices of those homes. In short, if negative impacts do exist, they are either too small or too infrequent to have any widespread statistically observable effect.

This is an evolving subject that requires thorough analysis by the practitioner along with the assistance of appraisal experts. The Berkeley study is a good starting point for the research.

12. [18.17] Exclusionary Zoning Issues

Exclusionary zoning issues involve the effort to exclude wind energy systems. One of the most significant problems facing municipalities relates to exclusion of particular uses from a given district or even from the entire municipality.

It has been generally stated that the municipality does not have the power to wholly restrict a lawful business from its boundaries. *People ex rel. Trust Company of Chicago v. Village of Skokie*, 408 Ill. 397, 97 N.E.2d 310 (1951). On the other hand, the courts have generally determined that excluding a particular use is arbitrary or discriminatory in light of already existing uses of nearby property. *City of Chicago v. Sachs*, 1 Ill.2d 342, 115 N.E.2d 762, 763 – 764 (1953).

13. [18.18] Comparison to Regulation of Cellular Towers

In 1996, it was estimated that over 100,000 cellular towers were needed to accommodate service. Many communities were opposed to having cellular towers located within their community, and Congress passed the Telecommunications Act of 1996, Pub.L. No. 104-104, 110 Stat. 56. This Act, while affirming local government's right to control the siting, construction, and modification of cellular and other wireless communication facilities, required municipalities to hold hearings and make certain findings before a tower could be excluded from a given location. The denial had to be based on zoning considerations, and there had to be a written justification for the denial. *See Illinois RSA No. 3, Inc. v. County of Peoria*, 963 F.Supp. 732 (C.D.Ill. 1997). The same type of policy considerations that impacted cellular towers in the 1990s also affect wind energy systems.

III. LITIGATION ISSUES

A. [18.19] Aesthetic Considerations

Zoning ordinances that include provisions that promote aesthetic purposes have been upheld if the reasonableness of the terms of the ordinance may be sustained on other grounds. These other grounds relate to the protection of property values. *See Neef v. City of Springfield*, 380 Ill. 275, 43 N.E.2d 947 (1942).

The court in *LaSalle National Bank v. City of Evanston*, 57 Ill.2d 415, 312 N.E.2d 625, 634 (1974), commented:

The reason advanced for declining to afford aesthetic qualities significant import is that the subject does not lend itself to exact definition but varies as to personal taste.

For example, some communities show great resistance to the idea of having wind turbines with large rotating blades 200 to 400 feet in the air in their neighborhood. In *Ecogen LLC v. Town of Italy*, 461 F.Supp.2d 100 (W.D.N.Y. 2006), a wind farm developer sued the town under §1983 of

the Civil Rights Act seeking relief from a moratorium prohibiting construction of windmills. The federal district upheld the moratorium even though it had been extended to two years, stating:

The development of wind power projects, which convert wind energy into electricity, seems to be on the upswing in this country but that growth has not been universally welcomed. See, e.g., Felicity Barringer, *Debate Over Wind Power Creates Environmental Rift*, N.Y. Times, June 6, 2006 at A18. As in *Don Quixote*, when one person sees a windmill, another sees a “monstrous giant” looming over the countryside. *Ecogen LLC v. Town of Italy*, 438 F.Supp.2d 149, 151 (W.D.N.Y. 2006).

In *In re Amended Petition of UPC Vermont Wind*, 185 Vt. 296, 969 A.2d 144 (2009), one such project met local opposition. In *UPC Vermont Wind*, the Supreme Court of Vermont discussed a test developed by the public service board, a board that has statutory authority to approve the siting of wind power facilities. In determining whether a project would have an undue adverse aesthetic impact, the board employed the so-called “Quechee test.” Under this test, an adverse aesthetic impact is considered undue if (1) it violates a clear, written community standard intended to preserve the aesthetic or scenic natural beauty of the area; (2) it offends the sensibilities of the average person; or (3) the applicant has failed to take generally available mitigating steps that a reasonable person would take to improve the harmony of the proposed project with its surroundings. 969 A.2d 152 – 153.

In addition, the court of appeals in *Rankin v. FPL Energy, LLC*, 266 S.W.3d 506 (Tex.App. 2008), discussed the aesthetic considerations raised as part of a nuisance claim. Specifically, the Texas court stated:

We cannot, therefore, agree with Plaintiffs that merely characterizing the wind farm as abnormal and out of place in its surroundings allows a nuisance claim based on an emotional reaction to the sight of FPL’s wind turbines. 266 S.W.3d at 512.

For more details on opposition based on nuisance concerns, see §18.20 below.

B. [18.20] Nuisance

Under Illinois law, to demonstrate a nuisance, a plaintiff must demonstrate that “the act, structure or device complained about must cause some injury, real and not fanciful, and must work some material annoyance, inconvenience or other injury to the person or property of another.” *Belmar Drive-In Theatre Co. v. Illinois State Toll Highway Commission*, 34 Ill.2d 544, 216 N.E.2d 788, 790 – 791 (1966). An aesthetic dispute is not enough. *Odd Fellows Oakridge Cemetery Ass’n v. Oakridge Cemetery Corp.*, 14 Ill.App.2d 378, 144 N.E.2d 853, 858 (1st Dist. 1957) (denying plaintiffs’ action to enjoin erection of standpipe and pump house on parcel of land conveyed to village because “[t]he principal objection urged by plaintiffs that the standpipe will be unsightly and out of place adjoining the beautiful and wellkept ground of the cemetery is not a legal objection”); *Rankin v. FPL Energy, LLC*, 266 S.W.3d 506, 511 (Tex.App. 2008) (holding that “Plaintiffs’ emotional response to the loss of their view due to the presence of numerous wind turbines substantially interferes with the use and enjoyment of their property” is not sufficient to establish nuisance action). A claim that a structure will diminish one’s property value

is also insufficient. *Flood v. Consumers Co.*, 105 Ill.App. 559 (1st Dist. 1903). *See also McGann v. Illinois Hospital Association Inc.*, 172 Ill.App.3d 560, 526 N.E.2d 902, 905 – 906, 122 Ill.Dec. 509 (4th Dist. 1988). Instead, there must be a “physical invasion of the plaintiff’s property.” *Schiller v. Mitchell*, 357 Ill.App.3d 435, 828 N.E.2d 323, 360, 293 Ill.Dec. 353 (2d Dist. 2005). This interference must be both substantial and unreasonable. *In re Chicago Flood Litigation*, 176 Ill.2d 179, 680 N.E.2d 265, 277 – 278, 223 Ill.Dec. 532 (1997).

In *McGann*, *supra*, the plaintiffs brought an action challenging the city council’s grant of variances for an adjacent parcel of land and sought to halt construction of an office building. The complaint identified the cause of action as a private nuisance and “allege[d] that this cause will arise because defendant’s building will exclude air and light from plaintiff McGann’s property, the design of the building and its alteration of traffic flow would create a health and safety hazard to persons seeking to enter the plaintiffs’ property, it would obscure the improvements of plaintiffs’ property, and it would diminish the value of the plaintiffs’ property.” 526 N.E.2d at 905. The appellate court ultimately rejected the plaintiffs’ nuisance allegations and held that the complaint “failed to convey to this court sufficient facts to find this case could go forward with any reasonable prospect of success.” 526 N.E.2d at 906. *See Belmar Drive-In*, *supra*, 216 N.E.2d at 790 – 791 (dismissing nuisance claim relating to artificial light from tollbooths).

In *Rankin*, *supra*, the court of appeals considered an action seeking injunctive relief pursuant to nuisance claims. The plaintiffs claimed that the wind farm’s visual impact constituted a nuisance. This case is a good example of a nuisance claim in regard to wind farms as it considers a variety of tests as to what constitutes a nuisance in the context of a wind farm. Further, Texas law is similar to that of Illinois in that “nuisance” is defined as “a condition that substantially interferes with the use and enjoyment of land by causing unreasonable discomfort or annoyance to persons of ordinary sensibilities.” 266 S.W.3d at 509. The court then goes on to further discuss general issues regarding nuisance as follows:

In practice, successful nuisance actions typically involve an invasion of a plaintiff’s property by light, sound, odor, or foreign substance. For example, in *Pascouet*, floodlights that illuminated the plaintiffs’ backyard all night and noisy air conditioners that interfered with normal conversation in the backyard, that could be heard indoors, and that interrupted plaintiffs’ sleep constituted a nuisance. . . . In *Bates*, the court noted that foul odors, dust, noise, and bright lights could create a nuisance . . . a cotton gin’s operations were a nuisance because of its loud noises and bright lights that could be seen and heard on plaintiff’s property and because of the dust, lint, and cotton burrs that would be carried there. [Citations omitted.] *Id.*

The *Rankin* court noted that aesthetics alone has never been the basis for a nuisance claim. 266 S.W.3d at 506. However, the plaintiffs in *Rankin* also argued that in addition to the visual impact, there were other impacts, such as blinking lights, shadow flicker, and operational noises. Nonetheless, the court was not willing to extend the law of nuisance to cover aesthetic concerns even in conjunction with other complaints. The court stated:

Unobstructed sunsets, panoramic landscapes, and starlit skies have inspired countless artists and authors and have brought great pleasure to those fortunate

enough to live in scenic rural settings. The loss of this view has undoubtedly impacted Plaintiffs. A landowner's view, however, is largely defined by what his neighbors are utilizing their property for. Texas caselaw recognizes few restrictions on the lawful use of property. If Plaintiffs have the right to bring a nuisance action because a neighbor's lawful activity substantially interferes with their view, they have, in effect, the right to zone the surrounding property. 266 S.W.3d at 512.

C. [18.21] Environmental Concerns

Many zoning ordinances dealing with this subject have provisions related to raptors or birds of prey and concerns of wind turbines harming nearby bird and bat populations. For example, the Bald and Golden Eagle Protection Act, 16 U.S.C. §668(a) protects against harming a bald or golden eagle “knowingly or with wanton disregard for the consequences.”

Likewise, the Migratory Bird Treaty Act, 16 U.S.C. §§704, 712, and the Coastal Zone Management Act of 1972, 16 U.S.C. §1452, require an environmental plan to be approved in regard to the siting of electrical generating facilities. The facilities are to be constructed on the sites selected to have the least adverse effects practicable on areas used for spawning, nesting, and seasonal migration of wild life species.

For an interesting discussion of a variety of issues, including the right of private enforcement of federal law, see *Coastal Habitat Alliance v. Patterson*, 601 F.Supp.2d 868 (W.D.Tex. 2009). In addition, for a more thorough analysis see the following articles:

1. Jennifer R. Andriano, *The Power of Wind: Current Legal Issues in Siting Wind Power*, 61 *Planning & Env't'l Law* 3 (2009);
2. Wendie L. Kellington, *Land Use Considerations in Siting Renewable Energy Projects (with a Focus on Wind)*, ALI-ABA Land Use Institute: Planning, Regulation, Litigation, Eminent Domain, and Compensation, p. 587 (2009); and
3. Rick Strange, *Weaving a Tangled Web: The Intersection of Energy Policy and Broader Governmental Policies*, 5 *Tex.J. Oil, Gas & Energy L.* 1 (2009 – 2010).

Aside from avian concerns, the creation of wind energy plants would actually have a positive environmental effect on a municipality. The American Wind Energy Association estimates that a 20-percent increase in wind energy by the year 2030 would reduce CO₂ emissions by 7.6 billion tons and would reduce water consumption in the electric sector by 4 trillion gallons. See *Wind Energy and the Environment Tutorial*, available at http://awea.org/faq/wwt_environment.html. See also U.S. Department of Energy, *20% Wind Energy by 2030*, available at www.20percentwind.org.

D. [18.22] Noise

The Illinois Institute for Rural Affairs has published a handbook entitled *HARVEST THE WIND: A WIND ENERGY HANDBOOK FOR ILLINOIS* (2004), available at www.iira.org/pubs/publications/ivardc_reports_614.pdf. In that handbook, it states in regard to noise:

Next to aesthetics, no aspect of wind energy creates more consternation or more debate than noise. Whether wind turbines are “noisy” is as much a subjective determination as whether wind machines appear “beautiful” or “ugly” on the landscape. Where wind turbines have been seen as an intrusion on an otherwise rural setting, some nearby residents have objected to them on the grounds of their noise impact. If wind turbines are unwanted for other reasons, such as their impact on the landscape, noise serves as the lightning rod for disaffection. HARVEST THE WIND, p. 44.

One of the documents often referred to by the critics of wind energy is a study entitled “The “how to” guide to criteria for siting wind turbines to prevent health risks from sound” by George W. Kamperman and Richard R. James (Oct. 28, 2008), available at www.windaction.org/documents/17229. In this study, Kamperman and James argue that the wind industry has worked with state and local governments to establish sound limits that are “lenient and favor the industry.” They advocate much lower decibel levels than those generally imposed or required. Indeed, the decibel levels that they argue for would make it virtually impossible to build wind turbines. Generally, the decibel level set by state and local government is 50 dBA. See, e.g., Wisconsin Model Ordinance for Towns/Counties §5.3, available at www.windaction.org/documents/13190. Kamperman and James argue that the sounds produced by wind turbines are found by some residents living near wind turbines to be “annoying.” This annoyance is being measured in comparison to other sounds that are not deemed by these same residents to be “annoying,” such as traffic or nearby industries. This is also true with regard to farm communities where the sounds of farm equipment are prevalent. This would include tractors and reaping machines common to rural communities.

However, a study produced by the American Wind Energy Association and Canadian Wind Energy Association entitled *Wind Turbine Sound and Health Effects: An Expert Panel Review*, (Dec. 2009), available at www.awea.org/newsroom/releases/awea_canwea_soundwhitepaper_12-11-09.pdf, presents a worthwhile analysis of this issue finding, among other things, that sounds emitted by wind turbines are not unique like tractors and reaping machines. Specifically, the study concludes:

1. There is no evidence that the audible or subaudible sounds emitted by wind turbines have any direct adverse physiological effects.
2. The ground-borne vibrations from wind turbines are too weak to be detected by, or to affect, humans.
3. The sounds emitted by wind turbines are not unique. There is no reason to believe based on the levels and frequencies of the sounds and the panel’s experience with sound exposures in occupational settings, that the sounds from wind turbines could plausibly have direct adverse health consequences.

See also George S. Hawkins, *One Page Takings Summary: U.S. Constitution and Local Land Use* (June 24, 2002), available at www.thewatershed.org/images/uploads/TheLawofTakings.pdf (case sensitive).

It is important to understand that wind turbines generate a variety of sounds. Over the years, wind turbines have gotten much quieter, but sound from the turbines is still an important part of the siting criteria. In general, the sound from a wind turbine originates from either a mechanical or an aerodynamic generation mechanism. The mechanical sound originates from gear boxes and control mechanisms. The aerodynamic sound is produced by the rotation of the turbine blades through the air. The turbine blade is shaped like an air foil. The idea is to produce a lift force when the air passes over the air foil. This was originally developed in connection with aircraft. The aerodynamic sound from the wind turbines is caused by the interaction of the turbine blade with the turbulence produced both adjacent to it and in its near wake. *Wind Turbine Sound and Health Effects*, p. 3-3.

In considering the sounds made by a wind turbine, it is important to consider the general definition of noise as any unwanted sound. It is common to think of certain sounds as noise, such as fingernails scratching on a blackboard or even music that is contrary to one's tastes. The music being played by a young person in the automobile next to you may often, and readily, be called noise. However, concerns about noise depend on the following:

1. the level of intensity, frequency, and patterns;
2. background sound levels;
3. the nature of the receptor; and
4. the attitude of the receptor about the emitter.

In general, the effects of noise on people can include

1. subjective effects, including annoyance and dissatisfaction;
2. interference with activity such as speech, sleep, and learning; and
3. physiological effects such as anxiety, tinnitus, or hearing loss.

Renewable Energy Research Laboratory, Department of Mechanical and Industrial Engineering, University of Massachusetts at Amherst, *Wind Turbine Acoustic Noise* (June 2002, amended Jan. 2006), available at www.ceere.org/rerl/publications/whitepapers/Wind_Turbine_Acoustic_Noise_Rev2006.pdf (case sensitive).

There is little doubt that prolonged and unprotected high exposure to noise at greater levels than 90 dBA is a risk for hearing loss in occupational settings. However, sounds from wind turbines do not approach these levels, generally being 50 dBA at a distance of 1,500 feet. Just for comparison, an auto horn at three feet produces 110 decibels. The New York subway station produces 90 decibels, and light auto traffic at 50 feet produces 50 decibels. See *Wind Turbine Sound and Health Effects*, *supra*.

There are also two other concerns related to wind turbine “noise.” One is called infrasound or low-level frequency sound, and the other is vibration. Infrasound and low-frequency sound are sounds that are below the average person’s ability to hear or detect. Most environmental low-frequency sound problems are caused by discreet tones (pitch or tones that are significantly higher in level or volume than the neighboring frequencies). An example that is given is that the noise from a neighbor’s stereo when the base notes are more pronounced than the higher frequency sounds. These may be irritating or stressful to certain individuals. In regard to vibration, the authors of *Wind Turbine Sound and Health Effects*, *supra*, call attention to vibration that refers to energy that travels through solid material and is distinguished from sound. It is detected through the feet or through the seat. The authors call attention to a study by Dr. Nina Pierpont, a physician who has hypothesized that there is a thing entitled “wind turbine syndrome.” The authors of the study conclude that vibration of the body by sound at one of its resonant frequencies occurs only at very high sound levels and is not a factor “in the perception of wind turbine noise.” *Wind Turbine Sound and Health Effects*, p. 3-10.

To address these issues, Illinois has noise standards as set forth in 35 Ill.Admin. Code §901.101, *et seq.*, and 415 ILCS 5/25, 5/27. It is certainly reasonable to apply the Illinois Pollution Control Board standards in regard to a wind farm siting as this appears to be the common approach in the preparation of zoning ordinances and special use permits.

E. [18.23] Shadow Flicker

Shadow flicker is when the blades of a wind turbine cast shadows that move rapidly across the ground and nearby structures. This occurs when the sun’s rays pass between the blades of the rotor and then onto the object, which could be a home or a backyard. In point of fact, this can only occur when the sun, the rotor blades, and the object are in alignment with each other. It is possible to calculate the number of minutes per year when this is possible. It is not known what, if any, impact this event has on human beings. There have been a variety of claims, including the claim that shadow flicker induces epileptic seizures. However, it is possible to easily rectify any effects of shadow flicker by blocking the sun’s rays during the times of the year when flicker might occur. This could be accomplished by the installation of awnings, the planting of trees or other shrubbery, or the use of heavy curtains. Most wind turbine companies are readily disposed to implementing a solution should there be complaints by neighboring property owners. For a discussion of flicker, see Mary Knipe and Charles E. McClelland, *Mount Wachusett Community College: Shadow Flicker Analysis* (May 19, 2009), available at www.mwcc.mass.edu/renewable/documents/shadowflickeranalysis.pdf; Frontier Power Systems, Inc., *Higgins Mountain II Wind Plant Analysis of Shadow Flicker on Ski Wentworth* (Dec. 6, 2007), available at www.3g-energy.com/Higgins%20WebSite%20Files/SkiWentworthShadowFlickerReport.pdf (case sensitive); Nils Bolgen, *Results of Shadow Flicker Analysis and Preliminary Acoustic Study for the Town of Fairhaven* (May 9, 2007), available at www.masstech.org/project%20deliverables/comm_wind/fairhaven/presentation-fairhavenshadow-acoustic2007-0509.pdf.

F. [18.24] Takings

The general issue of inverse condemnation and takings by regulation has been discussed elsewhere in this book. However, there are some unique considerations in regard to wind farms. Because of the controversy that wind farm developments often produce, some local governments have gone so far as to ban wind farms within their jurisdiction.

In *Zimmerman v. Board of County Commissioners of Wabaunsee County, Kansas*, 289 Kan. 926, 218 P.3d 400 (2009), the Supreme Court of Kansas considered one such regulation. In that case, the court held that the county-wide prohibition on commercial wind farms was a reasonable land use regulation. The plaintiffs who brought the action challenging the regulation alleged that the Board's decision amending the zoning regulations violated the Takings Clause and the Commerce Clause of the United States Constitution. The Supreme Court of Kansas ordered that there be supplemental briefing on the takings issue. 218 P.3d at 405.

The court then held that the regulation was reasonable based on three considerations that are somewhat surprising. The first consideration is aesthetics. The court held that aesthetics falls within the general welfare purposes of state and federal constitutions. Next the court also considered ecological concerns and that the county had determined that a wind farm would be "harmful to the environment." The county also determined that wind farms would be detrimental to property values. In particular, it would impact agriculture and nature-based tourism. 218 P.3d at 418.

However, determining a basis for the regulation does not stop the inquiry as to whether this constitutes a taking. In this regard, the briefing of this case has raised some unique issues in regard to a regulatory taking. In particular, the plaintiffs cite *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 536, 161 L.Ed.2d 876, 125 S.Ct. 2074, 2080 (2005), and the discussion in that case of three different forms of takings, including

1. when the government permits an owner to suffer a permanent physical invasion of his or her property by other citizens (*Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 73 L.Ed.2d 868, 102 S.Ct. 3164 (1982) (state law requiring landlords to permit cable companies to install cable facilities in apartment buildings constituted takings));
2. when a regulation completely deprives an owner of all economically beneficial use of his or her property (*Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 120 L.Ed.2d 798, 112 S.Ct. 2886 (1992) (state law that barred owner of beachfront property from erecting any habitable structures deprived owner of all economically beneficial use and constituted per se regulatory taking)); and
3. partial regulatory takings consisting of regulations that do not fully diminish a property's economic value, but nonetheless cause sufficient diminution in property value that just compensation is required (*Penn Central Transportation Co. v. City of New York*, 438 U.S. 104 (1978), 57 L.Ed.2d 631, 98 S.Ct. 2646; *Palazzolo v. Rhode Island*, 533 U.S. 606, 150 L.Ed.2d 592, 121 S.Ct. 2448, 2457 (2001)).

Using the *Penn Central* standards, a court is to consider the economic impact of the regulation on the claimant, the extent to which the regulation has interfered with “distinct investment-backed expectations,” and the “character of the governmental action,” *i.e.*, whether the government action is more like a physical invasion or a “public program adjusting the benefits and burdens of economic life to promote the common good.” 98 S.Ct. at 2659.

The argument being raised in *Zimmerman* is the *Penn Central* argument, at least in part, in that the owner does not have to show that he or she has lost all beneficial or productive use of the property. Rather, it is necessary to include an analysis of the extent of the regulation’s economic impact on the property and the extent to which the regulation interferes with the owner’s investment-backed expectations in the property. *Penn Central, supra*, 98 S.Ct. at 2659.

In addition, the argument for the need to define the property is also raised. This is sometimes done in terms of the horizontal and vertical rights. The argument cites *Vulcan Materials Co. v. City of Tehuacana*, 369 F.3d 882 (2004), in which the Fifth Circuit determined the horizontal and vertical parcels in a case involving a land use regulation similar to the regulation in *Zimmerman*. Vulcan owned the lease for the right to mine limestone in and around the City of Tehuacana (Brief of Amicus Curiae, NextEra Energy Resources, LLC, p. 15). In response to public displeasure with Vulcan’s mining operations, Tehuacana passed an ordinance forbidding coring or mining within the city limits thereby divesting Vulcan of the right to mine on half of the tracks of land. Tehuacana argued that the “right to mine limestone possessed by Vulcan is merely one of a ‘bundle of sticks’ and that the value of the entire bundle of sticks as opposed to just one stick — Vulcan’s leasehold interest — must be totally diminished before a categorical taking has taken place.” 369 F.3d at 889. The Fifth Circuit rejected this argument, explaining:

Clearly, “where an owner possesses a full ‘bundle’ of property rights, the destruction of one ‘strand’ of the bundle is not a [categorical] taking because the aggregate must be viewed in its entirety” — *i.e.*, the relevant parcel includes all the rights possessed by the owner. . . . Vulcan, however, does not possess a “full ‘bundle’ of property rights” and, therefore, the relevant parcel for the purposes of its takings claim is only the estate in which it has an interest — the limestone lease — and the value of the other interests — *i.e.*, surface agricultural uses — cannot be considered in determining whether all economically viable use of the property has been destroyed. [Citations omitted.] 369 F.3d at 889.

Thus, the Fifth Circuit pointed out that Vulcan only owned the mining rights, and therefore it was deprived of the only property that it owned. In essence, what is being argued in *Zimmerman* is that the wind farm operation or the wind energy is the property interest in question and is the only valuable interest to be considered in the *Zimmerman* takings case. The plaintiffs are arguing that the wind rights are a separate property right for purposes of evaluating a takings claim. As to a wind energy operator, that would be the only value in a lease or easement purchased. In any event, at the time of publication, this issue is still unresolved in the Kansas Supreme Court. Nonetheless, it is a unique and interesting issue to be considered by the practitioner.

In contrast to the foregoing, in *Ecker Brothers v. Calumet County*, 321 Wis.2d 51, 772 N.W.2d 240 (2009), the Wisconsin Court of Appeals held that a county ordinance restricting

construction of wind energy turbines was ultra vires, *i.e.*, outside the authority of the county under statutes regulating wind energy systems in Wisconsin. The court held that while the Wisconsin statutory scheme permits some regulation by local government, it generally preempts or expressly forbids such regulation unless the restriction satisfies one of three conditions:

1. It serves to preserve or protect the public health or safety.
2. It does not significantly increase the cost of the system or significantly decrease its efficiency.
3. It allows for an alternative system of comparable cost or efficiency.

In Illinois, it has long been held that municipalities do not have the power to wholly restrict a lawful business from their boundaries. *People ex rel. Trust Company of Chicago v. Village of Skokie*, 408 Ill. 397, 97 N.E.2d 310 (1951); *Suburban Ready-Mix Corp. v. Village of Wheeling*, 25 Ill.2d 548, 185 N.E.2d 665 (1962); *High Meadows Park, Inc. v. City of Aurora*, 112 Ill.App.2d 220, 250 N.E.2d 517 (2d Dist. 1969). This, of course, does not mean that a lawful use may be located anywhere within the municipal boundaries, but, rather, a determination is to be made as to whether prohibiting the particular use from a specific site was arbitrary or discriminatory in light of the already existing uses of nearby property. *City of Chicago v. Sachs*, 1 Ill.2d 342, 115 N.E.2d 762, 763 – 764 (1953). Therefore, in Illinois, it is not likely that a provision such as that found in the Kansas case would be upheld. However, to the extent that the particular use is to be balanced against the particular location in determining whether the regulation is arbitrary, it might be that the particular regulation would be upheld as not being a total ban but at the same time the regulation could constitute a taking under the argument being considered in *Zimmerman, supra*.

IV. [18.25] ILLINOIS LEGISLATION

Illinois legislation currently allows municipalities to regulate “wind farms.” Section 11-13-26 of the Municipal Code provides municipalities with authority to “regulate wind farms and electric-generating wind devices within its zoning jurisdiction and within the 1.5 mile radius surrounding its zoning jurisdiction.” 65 ILCS 5/11-13-26(a).

A. [18.26] Net Metering

Section 16-107.5 of the Public Utilities Act allows for what is termed “net electricity metering.” 220 ILCS 5/16-107.5. This legislation permits an “eligible customer” to have the benefit of net metering. The term “net electricity metering” or “net metering” “means the measurement, during the billing period applicable to an eligible customer, of the net amount of electricity supplied by an electricity provider to the customer’s premises or provided to the electricity provider by the customer.” 220 ILCS 5/16-107.5(b). In effect, the electricity provider charges the customer for the “net electricity supplied.” 220 ILCS 5/16-107.5(d).

If the amount of electricity used by the customer during the billing period exceeds the amount of electricity produced by the customer, the electricity provider charges for the net electricity

supplied to and used by the customer. On the other hand, if the amount of electricity produced by the customer during the billing period exceeds the amount of electricity used by the customer during that billing period, the electricity provider supplying the customer provides a credit to a subsequent bill for service to the customer for the net electricity supplied by the customer. 220 ILCS 5/16-107.5(d)(1), 5/16-107.5(d)(2). This clearly can be a benefit to customers who invest in renewable energy sources such as wind energy conversion systems. However, the statute does not provide that municipalities qualify as “eligible customers” within the meaning of the Act. Legislation has been proposed to rectify this situation but went back to the Rules Committee and has died there.

In addition, another bill was introduced into the Illinois legislature by Rep. Fred Cresto. This bill would amend the Public Utilities Act to provide that the definition of “eligible customer” for the purposes of allowing net metering would include “electrical generating facilities owned or operated by school districts, community college districts, or units of local government pursuant to an intergovernmental agreement.” H.B. 0692, 96th Gen.Assem. (2009). The bill provides, in part:

[E]ach electricity provider shall allow meter aggregation for the purposes of net metering eligible renewable electrical generating facilities owned or operated by school districts, community college districts, or units of local government pursuant to an intergovernmental agreement. . . . [E]lectricity providers shall provide net metering to all parties to the intergovernmental agreement so that all energy produced by the eligible renewable electrical generating facilities is applied as a 1:1 kilowatt hour credit for each party to the intergovernmental agreement. *Id.*

On March 15, 2009, the bill was re-referred to the Rules Committee, where it too has died.

B. [18.27] Intergovernmental Agreements

Section 11-15.3-1 of the Municipal Code provides that a municipality may own and operate a wind generation turbine farm, “either individually or jointly with another unit of local government, school district, or community college district that is authorized to own and operate a wind generation turbine farm, that directly or indirectly reduces the energy or other operating costs of the municipality.” 65 ILCS 5/11-15.3-1. A similar provision provides for a county to own and operate a wind farm either individually or jointly and for a school district to own and operate a wind farm or wind generation turbine farm either individually or jointly with a unit of government. 55 ILCS 5/5-42000; 105 ILCS 5/10-20.42.

This legislation gives a municipality, either individually or jointly with other units of local government pursuant to an intergovernmental agreement, the authority to develop a wind generation turbine farm. This would allow municipalities in conjunction with other local governmental bodies, including school districts and community college districts, to own and operate their own wind farms in order to reduce the energy costs of the municipality. This may open up great opportunities for local governments depending on their ability to join together to create a wind farm.

In this regard, there are issues that have to be resolved, such as how the wind energy would be transmitted to the various local government entities from the wind farm. This would especially be true if the wind farm was located in a distant part of the state. Furthermore, the cost and expense of creating a wind farm can be enormous, running into the hundreds of millions of dollars. It should be noted that the legislation does provide that the unit of local government may ask for the assistance of any state agency, including the Department of Commerce and Economic Opportunity, the Illinois Power Agency, or the Environmental Protection Agency in obtaining financing options for a wind generation turbine farm. It will be important for municipalities to see how this legislation is carried out in the near future.

C. [18.28] Net Aggregate Metering

The idea of operating as a consortium requires that there be a finding that the wind turbine facility will directly or indirectly reduce energy or other operating costs. This leads to the issue of “net aggregate metering” for each facility owned by the municipality, school district, community college, or county that builds a wind turbine farm. “Net aggregate metering” refers to the local electric utility (for example, Commonwealth Edison) giving the consortium members credit for each kilowatt hour produced by a wind turbine. The general notion and primary difference between “net metering” and “aggregate net metering” is how local government meters are aggregated together for the purpose of reading and billing purposes and applying the kilowatt hour credit. This may open up great opportunities depending on the ability of local governments to join together to create a wind farm.

D. [18.29] Ways Other than Net Metering or Aggregate Net Metering

Subject to the provisions of this Division 117, any municipality may (1) acquire, construct, own and operate within the corporate limits of the municipality any public utility the product or service of which, or a major portion thereof, is or is to be supplied to the municipality or its inhabitants and may contract for, purchase and sell the product or service of any such utility; provided, however, that any municipality may acquire, construct, own and operate without the corporate limits of any municipality any public utility for the transportation of persons; (2) acquire, construct, own, maintain and operate without the corporate limits of any municipality any electric power lines or substations necessary solely to provide power or a source of power for such municipality. 65 ILCS 5/11-117-1.

The authority to operate a public utility allows municipalities to include wind power as part of the electric power system and thereby directly benefit without the need for net metering. There are municipalities in Illinois that operate their own electric utility. These municipalities own the electric grid and their own generating plants. Their operation may consist of buying electricity based on daily market rate quotes, using their own generators, and supplementing their power source with wind turbines.

E. [18.30] Taxes

Wind energy also provides tax benefits to the municipality. Wind energy plants are more capital intensive than other types of power plants, and therefore property taxes are usually two or three times higher per unit of energy. Illinois has a wind energy property assessment statute.

Beginning in assessment year 2007, the fair cash value of wind energy devices shall be determined by subtracting the allowance for physical depreciation from the trended real property cost basis. Functional obsolescence and external obsolescence may further reduce the fair cash value of the wind energy device, to the extent they are proved by the taxpayer by clear and convincing evidence. 35 ILCS 200/10-605.

In Illinois, the fair cash value of a wind energy device is based on the nameplate capacity per megawatt. The fair cash value of a wind energy device is \$360,000 per megawatt of nameplate capacity. For example, beginning January 1, 2008, the Chief County Assessment Officer added an inflationary increase called a “trending factor.” In a project in which it is estimated that there will be a project capacity of 226.5 megawatts, based on this calculation, it is estimated that beginning in 2010 the amount of property tax will be \$2,192,116.

Please note that the provisions of 35 ILCS 200/10-605 apply to assessment years 2007 through 2011. They also do not apply to wind energy devices owned by any person or entity that is otherwise exempt from taxation such as a municipality.

F. [18.31] Leases

Farmers and farm communities stand to benefit greatly from wind energy production, not only from the basic electricity provided, but by way of royalties paid through lease and/or easement agreements.

In this regard, a landowner typically signs an agreement granting the wind farm developer a lease in their land (a temporary right to possession), or an easement with the right to use their land for the development, and in turn, the landowner receives compensation. Windustry, *Leasing Your Land to a Developer*, available at www.windustry.org/leases. A developer will typically lease only sufficient land to install the actual turbines, and then seek easements from neighboring farmers for uses such as a right-of-way over the land, the right to construct a roadway, or the right to build and maintain a power line over the land. Jessica A. Shoemaker, *Farmers' Guide to Wind Energy: Legal Issues in Farming the Wind* (June 2007), available at www.flaginc.org/topics/pubs/wind/FGWEcomplete.pdf (case sensitive). While payment varies from project to project, these agreements typically pay the landowner two to four percent of the gross annual turbine revenue. Energy and Environmental Resource Center at the University of North Dakota, *Harvesting the Wind: A Landowners' Guide to Wind Energy Development in the Great Plains*, available at www.undeerc.org/wind/literature/wind_brochure.pdf.

In negotiating wind and land agreements, each agreement should be as detailed as possible, and include provisions such as the duration of the agreement, conditions for renewal, compensation, terms of payment, the scope of the land subject to the agreement, permitted uses of

the land, and assignment rights. For a thorough discussion on each of these provisions and more, see *Farmers' Guide to Wind Energy: Legal Issues in Farming the Wind*, *supra*. See also Jessica A. Shoemaker, *Negotiating Wind Energy Property Agreements* (2007), available at www.flaginc.org/topics/pubs/arts/WindPropertyAgrmnts2007.pdf (case sensitive). In addition, see Robert R. Nardi and John H. Daniels, *Wind Energy Easements — Legal Issues*, for a breakdown on specific considerations for easement agreements. Finally, for a sample annotated lease agreement, see New York State Energy Research and Development Authority, *Wind Energy Toolkit* (May 2009), available at www.powernaturally.org/programs/wind/wind%20energy%20toolkit.pdf.

G. [18.32] Financing the Project

Clean renewal energy bonds (CREBs) are tax credit bonds. 26 U.S.C. §54. Congress has approved an additional \$800 million for these types of bonds. The new CREB program allocates the \$800 million equally, one third each, among three eligible groups: (1) units of state and local government, (2) municipal/public power companies, and (3) electric cooperatives. The Internal Revenue Code describes the regulations for the issuance and use of CREBs. These bonds must be issued by a “qualified issuer,” which includes governmental bodies and pursuant to an allocation by the Secretary of the Treasury, now referred to as “New Clean Renewable Energy Bonds” (NCREBs). In addition to CREBs, or, as they are now referred to, NCREBs (26 U.S.C. §54C), there are also qualified energy conservation bonds (QECBs) (26 U.S.C. §54D). The new clean renewable energy bonds are similar to the old renewable energy bonds, but unlike CREBs, which had a termination date of December 31, 2009, NCREBs have no termination date. QECBs provide the issuer with interest-free financing, and the bondholders receive federal tax credit in lieu of interest. The allocations are automatic and proportionate based on population. Both types of bonds QECBs and NCREBs provide for payments in the form of tax credits from the federal government to the holders of those bonds. The bonds are subject to the national volume cap of \$800 million. The issuer has the right to borrow for qualified purposes at interest rates that may be significantly lower than the interest rates on taxable debt or even other forms of tax-exempt bonds. For governmental bodies, the Secretary of the Treasury is granted discretion to determine the most appropriate method of allocating volume cap. These types of bonds are available to local governments to assist with the financing costs of qualified facilities used to generate electricity, which includes wind turbines.

V. APPENDIX

A. [18.33] Sangamon County Zoning Ordinance — Wind Energy Conversion Systems

WIND ENERGY CONVERSION SYSTEMS

17.49.010 Definitions

Setback The distance from a feature to a tower.

System Height The height above grade of the fixed portion of the tower, excluding the wind turbine itself.

Mini Wind Energy Conversion System (Mini WECS) The system by which wind energy is converted to electricity including a wind turbine, one tower, support system, blades and associated control and conversion electronics which has a rated capacity less than ten (10) kW and a system height less than thirty-five feet (35') or more.

Small Wind Energy Conversion System (SWECS) The system by which wind energy is converted to electricity including a wind turbine, one tower, support system, blades and associated control and conversion electronics which has a rated capacity of ten-one hundred (10-100) kW or a system height of thirty-five feet (35') or more.

Wind Energy Conversion System (WECS) The system by which wind energy is converted to electricity including wind turbines, towers, support systems, blades and associated control and conversion electronics which has a rated capacity over one hundred (100) kW.

WECS Site All parcels of land making up the WECS project.

WECS Perimeter The outer boundaries of the WECS site.

WECS Project All WECS, substations and ancillary facilities.

17.49.020 Mini Wind Energy Conversion System (Mini WECS)

A. Purpose and Intent

The purpose of these regulations is to provide a uniform and comprehensive set of standards for the installation and use of Mini Wind Energy Conversion Systems designed for on-site home, farm, and small commercial use that are used primarily to reduce on-site consumption of utility power. The intent of these regulations is to protect the public health, safety and community welfare without unduly restricting the development of Mini Wind Energy Conversion Systems.

B. Permitted Use

Mini Wind Energy Conversion Systems shall be considered an accessory use.

C. Special Requirements

Mini WECS are subject to the following requirements:

- 1) **Tower Height** Tower height shall be less than thirty-five feet (35').
- 2) **Setbacks** All parts of the Mini WECS structure shall be set back a distance equal to 1.1 times the system height from the side and rear property lines; the principal structure; and any electric or other utility lines. Mini WECS shall not be permitted in the front yard.
- 3) **Noise** Noise levels shall not exceed standards set by the Illinois Pollution Control Board for noise emissions from Class C land to Class A land regardless of the land use of the receiving land. Noise levels shall be enforced by both the State of Illinois and Sangamon County.
- 4) **Certification** All Mini WECS shall conform to applicable industry standards of the American National Standards Institute (ANSI) and be approved by a small wind certification program recognized by the American Wind Energy Association.
- 5) **Appearance** The Mini WECS Surface shall be a non-reflective, unobtrusive color (usually white or gray). No advertising signs or graphic designs shall be permitted on the Mini WECS. The manufacturer's identification with ratings is allowed.
- 6) **Safety** All Mini WECS shall be unclimbable for fifteen feet (15') above ground level. A visible "High Voltage" warning sign shall be placed on the Mini WECS.
- 7) **Lighting** The Mini WECS shall not be lighted except as required by the Federal Aviation Administration or other state or federal laws.
- 8) **Building Codes** All county, state and national construction codes shall be followed.
- 9) **Use** The Mini WECS shall provide electricity for on-site use only. However, the Mini WECS may be connected to the commercial grid.

D. Certificate of Compliance

Before a certificate of compliance and building permit are issued, the following shall be submitted to the Sangamon County Department of Zoning and Building Safety for review.

- 1) **Site Plan showing**
 - a) name, address and phone number of the property owner
 - b) property lines
 - c) all structures
 - d) septic fields
 - e) setback lines
 - f) location of the tower, guy lines or anchor bases
 - g) location of any above ground utility lines

- 2) **Additional information to be supplied with the site plan**
 - a) Mini WECS manufacturer
 - b) Name-plate generating capacity
 - c) Height according to manufacturer
- 3) Evidence that the local electric utility has been informed of the customer's intent to install an interconnected customer-owned generator, if applicable.

17.49.030 Small Wind Energy Conversion System (SWECS)

A. Purpose and Intent

The purpose of these regulations is to provide a uniform and comprehensive set of standards for the installation and use of Small commercial use that are used primarily to reduce on-site consumption of utility power. The intent of these regulations is to protect the public health, safety and community welfare without unduly restricting the development of Small Wind Energy Conversion systems.

B Permitted Use

Small Wind Energy Conversion Systems shall be considered an accessory use on parcels of land three (3) acres or larger.

C Special Requirements

SWECS are subject to the following requirements.

- 1) **Tower Height** Tower height shall be thirty-five feet (35') to eighty feet (80').
 - 2) **Setbacks** All parts of the SWECS structure shall be set back a distance equal to 1.1 times the system height from the front, side and rear property lines; the principal structure; and any electric or other utility lines.
 - 3) **Noise** Noise levels shall not exceed standards set by the Illinois Pollution Control Board for noise emissions from Class C land to Class A land regardless of the land use of the receiving land. Noise levels shall be enforced by both the State of Illinois and Sangamon County.
 - 4) **Certification** All SWECS shall conform to applicable industry standards of the American National Standards Institute (ANSI) and be approved by a small wind certification program recognized by the American Wind Energy Association.
 - 5) **Appearance** SWECS surface shall be a non-reflective, unobtrusive color (usually white or gray). No advertising signs or graphic designs shall be permitted on the SWECS. The manufacturer's identification with ratings is allowed.
 - 6) **Safety** All SWECS shall be unclimbable for fifteen (15') above ground level. A visible "High Voltage" warning sign shall be placed on the SWECS.
 - 7) **Lighting** The SWECS shall not be lighted except as required by the Federal Aviation Administration or other state or federal law.
 - 8) **Building Codes** All county, state and national construction codes shall be followed.
 - 9) **Use** The SWECS shall provide electricity for on-site use only. However, the SWECS may be connected to the commercial grid. Only one WECS shall be allowed per land parcel or per principal structure.
- D Certificate of Compliance** Before a certificate of compliance shall be issued, the following shall be submitted to the Sangamon County Department of Zoning and Building Safety for review.
- 1) **Site Plan showing:**
 - a) Name, address and phone number of the property owner
 - b) Property lines
 - c) All structures
 - d) Septic field
 - e) Setback lines
 - f) Location of the tower, guy lines or anchor bases

- g) Location of any above ground utility lines
- 2) **Additional information to be supplied with the site plan:**
 - a) SWECS manufacturer
 - b) Name-plate generating capacity
 - c) Height according to manufacturer
- 3) Evidence that the local electric utility has been informed of the customer's intent to install an interconnected customer-owned generator.
- 4) Letter from the Federal Aviation Administration (FAA) stating that the SWECS complies with FAA regulations.
- 5) Additional structural and anchoring information may be required before a building permit is issued.

17.49.040 Wind Energy Conversion System (WECS)

A Purpose and Intent

The purpose of these regulations is to provide a uniform and comprehensive set of standards for the installation and use of Wind Energy Conversion Systems designed for commercial energy production. The intent of these regulations is to protect the public health, safety and community welfare while allowing development of wind energy resources for commercial purposes.

B Conditional Permitted Use

WECS shall be a conditional permitted use in the A Agriculture zoning district on single or contiguous parcels of land totaling forty (40) acres or more in size. An existing principal structure on a parcel does not preclude placement of a WECS.

C Petition

All policies, procedures and standards of Chapter 17.58 – Conditional Permitted Uses – shall apply. In addition, the petition for a Conditional Permitted Use (CPU_ shall include:

- 1) A written summary of the project including:
 - a) a general description of the project, including its approximate name plate generating capacity;
 - b) The potential equipment manufacturer(s) and type(s) of WECS(s);
 - c) Number of WECS towers, and name plate generating capacity of each WECS;
 - d) The system height;
 - e) Diameter of the WECS(s) rotor(s); and
 - f) Description of the applicant, owner and operator, including their previous WECS experience.
- 2) The name(s), address(es), and phone numbers(s) of the owner and operator.
- 3) A site plan of the WECS site showing:
 - a) Boundaries of the project;
 - b) Location of each WECS tower, guy lines and anchor bases (if any);
 - c) All WECS structures including, but not limited to, the project substation, interconnect substation and location and voltage of any overhead transmission lines;
 - d) Property lines;
 - e) Setback lines;
 - f) Public access roads;
 - g) Location of all existing structures with their uses identified; and
 - h) Land use, zoning, public roads and structures within one thousand feet (1000') of the WECS site.

D. Special Requirements WECS are subject to the following requirements:

- 1) **Location** A WECS shall not be located within one and one-half (1½) miles of an incorporated area with a population over ten thousand (10,000) or within one-half

(1/2) mile of an incorporated area with a population of less than ten thousand (10,000). WECS shall not be located so that they interfere with contiguous urban development.

- 2) **Height** Height shall meet the requirements of the Federal Aviation Administration or other state or federal laws.
- 3) **Setbacks**
 - a) perimeter setback – one thousand two hundred feet (1,200'). If the distance from the WECS tower to the WECS site perimeter is less than one thousand two hundred feet (1,200'), the difference may be provided through a setback easement granted to the WECS owner allowing the easement property to be included as part of the one thousand two hundred foot (1,200') setback. The easement shall clearly state that the property may be subject to adverse impacts from the WECS and no habitable structure shall be constructed. The time limit of the setback easement shall be the same as the projected life of the turbine for which the easement is providing a setback. The easement shall not be automatically renewable.
 - b) principal structures on each parcel – one thousand feet (1,000') or three (3) times the rotor diameter, whichever is greater.
 - c) third party utility lines – 1.1 times the system height.
 - d) public road – 1.1 times the system height.
- 4) **Noise** Noise levels shall not exceed standards set by the Illinois Pollution Control Board for noise emissions from Class C land to Class A land regardless of the land use of the receiving land. Noise levels shall be enforced by both the State of Illinois and Sangamon County.

E. **Certification**

WECS shall conform to applicable industry standards, including those of the American National Standards Institute (ANSI). Applicants shall submit certificates of design compliance that equipment manufacturers have obtained from Underwriters Laboratories (UL), Det Norske Veritas (DNV), Germanischer Lloyd Wind Energie (GL), or an equivalent third party.

All applicable county, state and national construction and electric codes shall be followed.

F. **Appearance**

WECS surface shall be a non-reflective, unobtrusive color (usually white or gray). No advertising signs or graphic designs shall be permitted on the WECS. The manufacturer's identification with ratings is allowed.

G. **Safety**

- 1) All wiring between wind turbines and the wind energy facility substation shall be underground whenever possible.
- 2) Wind turbine towers shall not be climbable up to fifteen (15) feet above ground level.
- 3) All access doors to wind turbine towers and electrical equipment shall be lockable.
- 4) Appropriate signs warning of high voltage shall be placed on wind turbine towers, electrical equipment, and wind energy facility entrances.
- 5) All WECS shall be equipped with a redundant braking system. This includes both aerodynamic overspeed controls (including variable pitch, tip, and other similar systems) and mechanical brakes. Mechanical brakes shall be operated in a fail-safe mode. Stall regulation shall not be considered a sufficient braking system for overspeed protection.

H. **Lighting**

The WECS shall not be lighted except as required by the Federal Aviation Administration or other state or federal law.

I. **Use of Public Roads**

The owner or operator shall identify all public roads to be used for transporting WECS or substation parts and/or equipment for construction, operation, or maintenance of the WECS(s) or substation(s) and shall:

- 1) Conduct a pre-construction baseline survey to determine existing road conditions for assessing potential future damage; and
- 2) Submit an acceptable financial security in an amount determined by the appropriate highway authority to be used for the purpose of repairing any damage to public roads caused by constructing, operating or maintaining the WECS if not done by the WECS owner/operator when construction of the project is completed.

J. **Electromagnetic Interference**

No WECS shall be installed in any location where its proximity with existing fixed broadcast, retransmission, or reception antenna for radio, television, or wireless phone or other personal communication systems would produce electromagnetic interference with signal transmission or reception. No WECS shall be installed in a location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the link's operation.

The applicant shall provide the applicable microwave transmission providers, local emergency service providers and the Sangamon County Emergency Telephone System Department copies of the project summary and site plan. If these providers demonstrate a likelihood of interference with their communications resulting from the WECS, the applicant shall take measures to mitigate anticipated interference or relocate the WECS tower or facility.

If the WECS causes interference with local residential broadcast TV, steps to mitigate the problem must be taken.

K. **Shadow Flicker**

The applicant shall conduct a study on potential shadow flicker. The study shall identify the locations of shadow flicker that may be caused by the project and the expected durations of the flicker at these locations. The study shall identify problem areas where shadow flicker may interfere more than one (1) hour per year with residences and other existing uses and describe measures that shall be taken to eliminate or mitigate the problems. Any safety problems identified by the County Engineer caused by shadow flicker on roads shall be eliminated or mitigated.

L. **Decommissioning Plan**

The WECS project must provide a decommissioning plan to insure that the WECS equipment is removed and land is restored to its previous use upon the end of the project's life or as stated in Sec. 17.49.050. The plan shall include:

- 1) provisions for the removal of structures, debris and cabling on the surface and at least 5' below the surface.
- 2) Provisions for the restoration of the soil and vegetation;
- 3) An estimate of the decommissioning costs certified by a professional engineer in current dollars;
- 4) A financial plan approved by Sangamon County to ensure funds will be available for decommissioning and land restoration;
- 5) A provision that the terms of the decommissioning plan shall be binding upon the owner or operator and any of their successors, assigns, or heirs; and
- 6) A provision that Sangamon County shall have access to the site and to the funds outlined in 17.49.040L. (4) above to effect or complete decommissioning one (1) year after cessation of operations.

M. Certificate of Compliance**1) Required Submission**

The following items shall be submitted to the Sangamon County Department of Zoning and Building Safety:

- a) Site plan with all items previously required. Additional items to be included are:
 - 1) Electrical cabling from the WECS tower to the substation(s);
 - 2) Ancillary Equipment;
 - 3) Third party transmission lines;
 - 4) Wells;
 - 5) Septic fields;
 - 6) Field tile location;
 - 7) Existing easements;
 - 8) Floodplain location and elevation, if applicable;
 - 9) Wetland location, if any
- b) noise assessment including average and maximum noise levels at perimeter property lines and at housing units within the project.
- c) Phase I Avian Screening Report by a qualified third party and all correspondence with the Illinois Department of Natural Resources and U.S. Fish and Wildlife Service regarding the project.
- d) Letter from the FAA stating the project is in compliance with FAA height and lighting requirements.
- e) Letter of compliance from the Illinois Historic Preservation Agency.
- f) Emergency plan.
- g) All required studies, reports, certifications, and approvals demonstrating compliance with the provisions of this Ordinance.

2) Review

Due to the complexity of the project and the information submitted, it shall be reviewed by a committee consisting of one or more representatives from:

- a) Sangamon County Department of Zoning and Building Safety
- b) Springfield-Sangamon County Regional Planning Commission
- c) Sangamon County Engineer
- d) Sangamon County Emergency Telephone System Department
- e) Sangamon County Administrator
- f) Sangamon County State's Attorney
- g) Applicable fire protection district

If the committee determines that all requirements of the ordinance have been met, the Zoning Administrator shall issue a Certificate of Compliance.

The building permit may be reviewed at the same time.

17.49.050 Cessation of Operations

If any Wind Energy Conversion System provided for in this chapter (Mini WECS, SWECS and WECS) has not been operation and producing electricity for at least two hundred seventy (270) consecutive days, it shall be removed. The Sangamon County Zoning Administrator shall notify the owner to remove the system. Within thirty (30) days, the owner shall either submit evidence showing that the system has been operating and producing electricity or remove it. If the owner fails to or refuses to remove the Wind Energy Conversion System, the violation shall be referred to the Sangamon County States Attorney for enforcement.

17.49.050 Penalties

A failure to obtain applicable building permit(s) for the construction of a Wind Energy Conversion System or failure to comply with the requirements of a building permit or the provisions of this Ordinance shall be deemed a violation of this ordinance. The State's Attorney

may bring an action to enforce compliance of the requirements of this Ordinance by filing an action before the Sangamon County Ordinance Violation Hearing Department or by filing an action in the Circuit Court for an injunction requiring conformance with this ordinance or seek such other order as the court deems necessary to secure compliance with this ordinance.

Any person who violates this ordinance shall be fined not less than twenty five dollars (\$25) or more than five hundred dollars (\$500). A separate offense shall be deemed committed upon each day during or on which a violation occurs or continues.

Nothing herein shall prevent the County from seeking such other legal remedies available to prevent or remedy any violations of this ordinance.

B. [18.34] Road Maintenance Agreement

FORM(S) AVAILABLE BY PURCHASING HANDBOOK OR BY SUBSCRIBING TO SMARTBOOKS® OR SMARTBOOKSPLUS.

C. [18.35] Property Value Guarantee Agreement

FORM(S) AVAILABLE BY PURCHASING HANDBOOK OR BY SUBSCRIBING TO SMARTBOOKS® OR SMARTBOOKSPLUS.

D. [18.36] Wind Energy Resources**Wind Energy Resources**

For more information on wind energy and wind farms, please see the following resources:

American Wind Energy Association, www.awea.org.

Burton, Tony et al., WIND ENERGY HANDBOOK (2001).

Farmers' Legal Action Group, Inc., FARMERS' GUIDE TO WIND ENERGY: LEGAL ISSUES IN FARMING THE WIND (June 2007), www.powernaturally.org/programs/wind/toolkit/farmersguidewindenergy.pdf.

Gipe, Paul, WIND POWER: RENEWABLE ENERGY FOR HOME, FARM, AND BUSINESS (2004).

Iowa Energy Center, WIND ENERGY MANUAL, www.energy.iastate.edu/renewable/wind/wem-index.htm.

LEGAL SYSTEMS AND WIND ENERGY: A COMPARATIVE PERSPECTIVE (Helen T. Anker, Birgitte E. Olsen, and Anita Ronne, eds.) (2009).

Manwell, James F. et al., WIND ENERGY EXPLAINED: THEORY, DESIGN AND APPLICATION (2010).

National Renewable Energy Laboratory, www.nrel.gov/wind/publications.html.

National Wind Coordinating Collaborative, www.nationalwind.org.

United States Department of Energy, www.eere.energy.gov/windandhydro.

Wind Powering America: State Wind Activities, www.windpoweringamerica.gov/state_activities.asp.

Windustry, www.windustry.org.

Windustry and Illinois Institute for Rural Affairs at Western Illinois University, *HARVEST THE WIND: A WIND ENERGY HANDBOOK FOR ILLINOIS* (2004), www.iira.org/pubs/publications/ivardc_reports_614.pdf.

The FARMERS' GUIDE TO WIND ENERGY also suggests the following resources:

ENERGY LAW AND TRANSACTIONS (David J. Muchow and William A. Mogel, eds.) (2006).

Energy Trust of Oregon, *COMMUNITY WIND: AN OREGON GUIDEBOOK* (2005), http://energytrust.org/library/forms/cw_pg_commwindguidebook.pdf.

Iowa Department of Natural Resources, *Iowa Wind Energy Checklist* (2003), www.iowadnr.gov/energy/newfiles/new_checklist.pdf.

Izaak Walton League, *LANDOWNER'S GUIDE TO WIND ENERGY IN THE UPPER MIDWEST* (2001) (copies may be ordered from the Midwest Office of the Izaak Walton League of America by calling (651) 649-1446 or e-mailing midwestoffice@iwla.org).

New York State Energy Research and Development Authority, *Wind Energy Tool Kit*, www.powernaturally.org/programs/wind/toolkit.asp.

Stoel Rives, LLP, *THE LAW OF WIND: A GUIDE TO BUSINESS AND LEGAL ISSUES*, www.stoel.com/lawofseries.aspx.

Joseph P. Tomain and Richard D. Cudahy, *ENERGY LAW IN A NUTSHELL* (2004).

E. [18.37] Resources for Funding of Wind Farms

For more information on funding of wind farms, please see the following:

Database of State Incentives for Renewables & Efficiency, www.dsireusa.org.

Gilmore & Bell, PC, *Qualified Energy Conservation Bonds* (Aug. 2009), www.gilmorebell.com/qualified_energy_conservation_bonds.pdf.

K&L Gates LLP, *Alternative Energy Provisions Set Forth in the American Recovery and Reinvestment Act of 2009* (Feb. 2009), www.klgates.com/newsstand/detail.aspx?publication=5332.

McGuireWoods, LLP, *Treasury Awards Allocation for New Clean Renewable Energy Bonds* (Nov. 2009), www.mcguirewoods.com/news-resources/item.asp?item=4327.