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BEFORE THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON

An Ordinance Amending Title 18, of the Deschutes County Code Zoning Code. *
* ORDINANCE NO. 2011-009

WHEREAS, the Board of County Commissioners ("Board") directed County staff to initiate amendments to Deschutes County Code ("DCC"), Title 18, zoning regulations for small wind energy systems; and

WHEREAS, after notice was given in accordance with applicable law, public hearings were held on August 26, 2010, October 14, 2010, and January 13, 2011 before the Deschutes County Planning Commission and, on February 24, 2011, the Planning Commission recommended approval; and

WHEREAS, the Board considered this matter after a public hearing on May 23, 2011 and concluded that the public will benefit from changes to the zoning regulations; now, therefore,

THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON, ORDAINS as follows:

Section 1. AMENDMENT. DCC 18.04.030, Definitions, is amended to read as described in Exhibit "A", attached hereto and by this reference incorporated herein, with new language underlined and language to be deleted in ~~strikethrough~~.

Section 2. ADDITION. DCC 18.116.300, Wind Energy Systems that Generate Less than 100 kW, is added to read as described in Exhibit "B", attached hereto and by this reference incorporated herein.

Section 3. AMENDMENT. DCC 18.120.040, Exceptions - Building Height Restrictions, is amended to read as described in Exhibit "C", attached hereto and by this reference incorporated herein, with new language underlined and language to be deleted in ~~strikethrough~~.

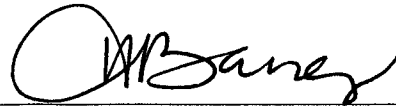
Section 4. AMENDMENT. DCC 18.124.030, Site Plan Review, is amended to read as described in Exhibit "D", attached hereto and by this reference incorporated herein, with new language underlined and language to be deleted in ~~strikethrough~~.

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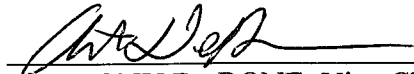
Section 5. FINDINGS. The Board adopts as its findings Exhibit "E," attached and incorporated by reference herein.

Dated this 13th of July, 2010

BOARD OF COUNTY COMMISSIONERS
OF DESCHUTES COUNTY, OREGON

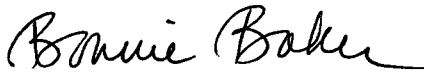


TAMMY BANEY, Chair



ANTHONY De BONE, Vice Chair

ATTEST:



Recording Secretary



ALAN UNGER, Commissioner

Date of 1st Reading: 27th day of June, 2011.

Date of 2nd Reading: 13th day of July, 2011.

Record of Adoption Vote:

Commissioner	Yes	No	Abstained	Excused
Dennis R. Luke	✓	—	—	—
Alan Unger	✓	—	—	—
Tammy Baney	✓	—	—	—

Effective date: 17th day of October, 2011.

“*****” Denotes portions of the code not amended by Ordinance 2011-009.

Chapter 18.04. TITLE, PURPOSE AND DEFINITIONS

18.04.030. Definitions.

18.04.030. Definitions.

As used in DCC Title 18, the following words and phrases shall mean as set forth in DCC 18.04.030.

“Wind Energy System” A “wind energy system” consists of equipment that converts energy from the wind into usable forms of energy (such as electricity) and then stores or transfers the energy. This equipment includes any base, blade, foundation, wind generator, nacelle, rotor, wind tower, transformer, vane, wire, inverter, batteries or other component used in the system. A wind energy system may be a grid-connected or a stand-alone system.

“Wind tower” means a monopole, freestanding, or guyed structure that supports the wind generator.

(Ord. 2011-009 §1, 2011; Ord. 2008-007 §1, 2008; Ord. 2008-015 §1, 2008; Ord. 2007-005 §1, 2007; Ord. 2007-020 §1, 2007; Ord. 2007-019 §1, 2007; Ord. 2006-008 §1, 2006; Ord. 2005-041 §1, 2005; Ord. 2004-024 §1, 2004; Ord. 2004-001 §1, 2004; Ord. 2003-028 §1, 2003; Ord. 2001-048 §1, 2001; Ord. 2001-044 §2, 2001; Ord. 2001-037 §1, 2001; Ord. 2001-033 §2, 2001; Ord. 97-078 §5, 1997; Ord. 97-017 §1, 1997; Ord. 97-003 §1, 1997; Ord. 96-082 §1, 1996; Ord. 96-003 §2, 1996; Ord. 95-077 §2, 1995; Ord. 95-075 §1, 1975; Ord. 95-007 §1, 1995; Ord. 95-001 §1, 1995; Ord. 94-053 §1, 1994; Ord. 94-041 §§2 and 3, 1994; Ord. 94-038 §3, 1994; Ord. 94-008 §§1, 2, 3, 4, 5, 6, 7 and 8, 1994; Ord. 94-001 §§1, 2, and 3, 1994; Ord. 93-043 §§1, 1A and 1B, 1993; Ord. 93-038 §1, 1993; Ord. 93-005 §§1 and 2, 1993; Ord. 93-002 §§1, 2 and 3, 1993; Ord. 92-066 §1, 1992; Ord. 92-065 §§1 and 2, 1992; Ord. 92-034 §1, 1992; Ord. 92-025 §1, 1992; Ord. 92-004 §§1 and 2, 1992; Ord. 91-038 §§3 and 4, 1991; Ord. 91-020 §1, 1991; Ord. 91-005 §1, 1991; Ord. 91-002 §11, 1991; Ord. 90-014 §2, 1990; Ord. 89-009 §2, 1989; Ord. 89-004 §1, 1989; Ord. 88-050 §3, 1988; Ord. 88-030 §3, 1988; Ord. 88-009 §1, 1988; Ord. 87-015 §1, 1987; Ord. 86-056 §2, 1986; Ord. 86-054 §1, 1986; Ord. 86-032 §1, 1986; Ord. 86-018 §1, 1986; Ord. 85-002 §2, 1985; Ord. 84-023 §1, 1984; Ord. 83-037 §2, 1983; Ord. 83-033 §1, 1983; Ord. 82-013 §1, 1982)

Chapter 18.116. SUPPLEMENTARY PROVISIONS

18.116.300. Wind Energy Systems that Generate Less than 100 kW

- A. DCC 18.116.300 applies only to non-commercial wind energy systems generating less than 100 kW of electricity.
- B. For purposes of this section, all tower height measurements are to be taken from the ground to the top of the turbine blade.
- C. Outright Permitted in All Zones, subject to the applicable provisions in this section:
 - 1. A wind energy system that is accessory to the primary use of the property and is no higher than thirty-six (36) feet in height.
 - 2. A wind energy system that is accessory to the primary use of the property generating 0 to 15 kW of electricity, greater than thirty-six (36) feet in height.
- D. Site Plan Review: A wind energy system that generates greater than 15 to 100 kW of electricity shall be permitted in all zoning classifications where accessory structures are permitted, subject to DCC Chapter, 18.124, Site Plan Review.
- E. Setback:
 - 1. 0 to 100 kW wind energy systems for which the tower is 36 feet in height or less must, for all parts of the wind energy system, meet the setback requirements for accessory structures based on the underlying zoning.
 - 2. 0 to 100 kW wind energy systems for which the tower is greater than 36 feet in height shall not allow any part of the wind energy system structure to extend closer than one times the height of the tower from the installation site to the nearest property boundaries.
- F. All wind energy systems subject to DCC 18.116.300(A) are also subject to the following:
 - 1. Noise:
 - a. Wind energy systems shall not exceed 60 decibels, as measured at the nearest property boundaries.
 - b. The noise level may be exceeded during short-term events such as utility outages and/or severe storms.
 - 2. Lighting: A wind tower or wind energy system shall not be artificially lighted unless such lighting is required by the FAA.
 - 3. Signs: All signs, both temporary and permanent are prohibited, except as follows:
 - a. Manufacturer's or installer's identification on the wind generator; or,
 - b. Appropriate warning signs and placards.
 - 4. Approved Wind Energy generator: Wind turbines must have been approved by Oregon Department of Energy or any other wind energy certification programs recognized by the American Wind Energy Association.
 - 5. State Code Compliance:
 - a. All wind energy systems shall comply with the currently adopted edition of the Oregon Structural Specialty Code, or if accessory to a single family dwelling, the Oregon Residential Specialty Code.
 - b. Compliance with the National Electrical Code: Electrical permit applications shall be accompanied by a one-line diagram showing the system components and size and type of equipment in sufficient detail to demonstrate compliance with the current edition of the National Electrical Code.
 - 6. Compliance with FAA Regulations: Wind energy systems must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.
 - 7. Utility Notification:
 - a. Wind energy systems shall not be installed until evidence has been given to the Planning Division that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator.

- b. A wind energy system that supplies sufficient energy such that all uses on the property upon which the wind energy system is located are self-sufficient and completely independent of any other public or private energy utility shall be exempt from this requirement.
 - 8. The color of the wind energy system shall be either an unobtrusive stock color from the manufacturer or painted in a non-reflective, unobtrusive color that blends in with the surrounding environment.
 - 9. Prior to issuance of a building permit, the property owner shall record against the property a "Condition of Approval Agreement" that certifies the wind energy system will either be removed from the property or laid down on the ground, horizontally, at the property owner's sole expense, when use has been discontinued from operating for more than one (1) year.
- (Ord. 2011-009 §1, 2011)

Chapter 18.120. EXCEPTIONS

18.120.040. Building Height Exceptions.

- A. The following structures or structural parts are not subject to the building height limitations of DCC Title 18:
1. chimneys, not more than three feet six inches above the highest point of the roof, vertical support structures for telephone and power transmission lines in utility easements or public rights-of-way, not requiring a site plan review as defined in DCC 18.124.060, flagpoles not exceeding 40 feet, agricultural structures as defined in DCC 18.04.030 not exceeding 36 feet, and amateur radio facilities as outlined in DCC Title 18.116.290. This exception does not apply to an Airport Development Zone, Airport Safety Combining Zone or Landscape Management Combining Zone.
- B. The following structures or structural parts may receive exceptions to the building height limitations of DCC Title 18 if approved as part of a Site Plan Review, as defined in DCC 18.124.060 and subject to the criteria contained therein: non-commercial wind energy systems generating less than 100 kW of electricity, public schools, vertical support structures for telephone and power transmission lines requiring a site plan, structures that are necessary for public safety and flagpoles. This exception does not supersede the more restrictive requirements that are found in the Airport Safety Combining Zone or Landscape Management Combining Zone.
- C. An exception (up to 36 feet) to the building height limitations for structures not otherwise exempted by DCC 18.120.040(A) may be approved upon findings that:
1. The structure is not located in a Landscape Management Zone, except when the structure is a single-family dwelling with an attached hangar located in an unincorporated community and the structure has a maximum height of 35 feet including chimneys, antennas, flagpoles or other projections from the roof of the structure;
 2. The structure is not located within 100 feet of any rimrock, as defined in DCC 18.04.030;
 3. After consultation with the applicable fire department, the proposed height does not exceed the height limitation of the department's fire fighting equipment, considering the evacuation of the building's occupants and the fire fighting requirements of the department; and
 4. The proposed additional height will not adversely impact scenic views from existing nearby residences.
 5. The proposed structure shall relate harmoniously to the natural environment and existing development, minimizing visual impacts and preserving natural features including views and topographical features.
- D. An exception to building height limitations for agricultural structures may be approved upon findings that the applicant meets the criteria listed in DCC 18.120.040(C)(1) through (3) and demonstrates that the proposed structure is:
1. An agricultural structure as defined in DCC 18.04.030;
 2. Located in an EFU or Forest zone; and
 3. Necessary to conduct generally accepted farming practices that are typical or customary of Deschutes County farmers who are regularly involved in the proposed type of agriculture. The applicant shall document satisfaction of this criterion by submitting evidence or testimony from an authorized representative of the Deschutes County Farm Bureau.
- (Ord. 2011-009 §1, 2011; Ord. 2008-007 §3, 2008; Ord. 2001-033 §1, 2001; Ord. 2001-004 §3, 2001; Ord. 98-035 §1, 1998; Ord. 96-035 §1, 1996; Ord. 93-043 §20C, 1993; Ord. 92-055 §10, 1992; Ord. 92-036 §1, 1992)

Chapter 18.124. SITE PLAN REVIEW

18.124.030. Approval Required.

- A. No building, grading, parking, land use, sign or other required permit shall be issued for a use subject to DCC 18.124.030, nor shall such a use be commenced, enlarged, altered or changed until a final site plan is approved according to DCC Title 22, the Uniform Development Procedures Ordinance.
 - B. The provisions of DCC 18.124.030 shall apply to the following:
 - 1. All conditional use permits where a site plan is a condition of approval;
 - 2. Multiple-family dwellings with more than three units;
 - 3. All commercial uses that require parking facilities;
 - 4. All industrial uses;
 - 5. All other uses that serve the general public or that otherwise require parking facilities, including, but not limited to, landfills, schools, utility facilities, churches, community buildings, cemeteries, mausoleums, crematories, airports, parks and recreation facilities and livestock sales yards; and
 - 6. As specified for Flood Plain Zones (FP) and Surface Mining Impact Area Combining Zones (SMIA).
 - 7. Non-commercial wind energy system generating greater than 15 to 100 kW of electricity.
 - C. The provisions of DCC 18.124.030 shall not apply to uses involving the stabling and training of equine in the EFU zone, noncommercial stables and horse events not requiring a conditional use permit.
 - D. Noncompliance with a final approved site plan shall be a zoning ordinance violation.
 - E. As a condition of approval of any action not included in DCC 18.124.030(B), the Planning Director or Hearings Body may require site plan approval prior to the issuance of any permits.
- (Ord. 2011-009 §1, 2011; Ord. 2003-034 §2, 2003; Ord. 94-008 §14, 1994; Ord. 91-038 §1, 1991; Ord. 91-020 §1, 1991; Ord. 86-032 §1, 1986)

FINDINGS

The Deschutes County Planning Commission conducted three public hearings on August 26, October 14, and January 13, 2011 respectively to consider Text Amendment (TA) 2010-7, legislative amendments to Deschutes County Code (DCC) Title 18 that allow small wind energy systems.¹ On January 13, staff convened a panel of experts to discuss noise levels, scale, and wind turbine heights with an output rating of 100kw or less. The Planning Commission deliberated on February 14 and February 24, and then forwarded a recommendation of adoption to the Board of County Commissioners.

BACKGROUND

A. Existing Code

Wind energy facilities are allowed throughout Deschutes County in most zoning districts as a "utility facility for commercial energy production" or as a residential accessory structure. However, the height limitations effectively preclude the installation or development of such facilities. The maximum building height in most zoning districts is 30 feet. Exceptions are allowed for structures to be up to 36 feet outside the Landscape Management Combining Zone.

B. Feasibility of Small Wind Energy Systems

Small wind energy systems and turbines (sometimes called home- or farm-scale turbines) are turbines that produce enough power for a single home, farm, or small business. Small wind turbines typically have an output rating of 100 kW. However, the time, expense, and restrictions of a local zoning ordinance too often pose tremendous challenges to consumers interested in wind energy. By designating small wind energy systems as an allowed use, local governments can effectively streamline the permitting process to ensure safe, effective, and practical installations.

Small wind turbine installation sites must meet a few key physical qualifications. A site must:

- Be located within about 1,500 feet of a utility's electrical meter; and,
- Experience average wind speeds of at least 10 mph.²

According to *Small Wind Electric Systems, an Oregon Consumer Guide*, areas in Deschutes County receive a Wind Power Class rating between 1-6, equating to wind speeds, measured at 33 feet, between <9 mph to 15.7 mph.³ As a rule, a Class 2 wind or above is adequate for small wind energy systems.⁴ Another general rule of thumb for proper and efficient operation of a wind turbine is that the bottom of the turbine's blades should be at least 10 feet above the top of anything within 300 feet.⁵

¹ A public notice was published in the *Bulletin* on August 8, 2010.

² <http://energytrust.org/shared-resources/wind-speed/default.aspx?src=residential>

³ *Source Document #1. Small Wind Electric Systems, An Oregon Guidebook.* See Introduction and Page 13.

⁴ *Source Document #2. Ask the Author,* American Planning Association.

⁵ *Source Document #3. Overcoming Barriers, Expanding the Market for Small Wind Energy Systems.* Page 16

C. Incentives

Incentive programs like the Energy Trust of Oregon's Small Wind Incentive program provide resources and cash incentives for customers of Portland General Electric and Pacific Power that are installing turbines up to 50 kilowatts (kW). Other available incentives include a residential tax credit through the Oregon Department of Energy of \$2.00/kilowatt-hour produced in the first year of operation, up to \$6,000 (up to \$1,500 may be claimed per year), and a business tax credit of 50% of installed system cost applied over five years.

PROPOSED TEXT AMENDMENT

The proposed text amendments create an approval process to allow small wind energy systems. The proposed text amendments are outlined in the attached exhibits and underlined for new language and shown as ~~strikethrough~~ for deleted language.

D. Approach

The key to facilitating small wind energy systems is to reduce potential negative land use impacts as much as possible without reducing the function of those systems. Deschutes County's approach is to adequately address impacts of small wind turbines in a way that is responsible to realistic concerns but not onerous to the turbine owner. Time and cost requirement for permitting are among the biggest hurdles for many potential turbine owners and can quite easily determine whether a small wind turbine is effective.⁶ Likewise, it is best to prepare an ordinance to apply broadly, leaving it up to individual property owners to assess whether their site-specific wind resource is adequate.⁷

Initiated by staff at the request of the Board of County Commissioners, TA 2010-7 encompassed in Ordinance No. 2011-009 establishes an approval process to allow small wind energy systems, including wind towers for non-commercial use that generate less than 100 kW. As proposed, these wind energy systems will require review subject to DCC:

- Exhibit A: 18.04, Definitions
- Exhibit B: 18.112, Supplemental Provisions
- Exhibit C: 18.120, Exceptions
- Exhibit D: 18.124, Site Plan Review

E. Small Wind Energy Systems Permitted Outright

Small wind energy systems, accessory to the primary use of a property are proposed to be permitted outright in all zones if:

- Structure generates 0 to 100 kW and is 36 feet or less in height to the top of the turbine blade. Noise cannot exceed 60 decibels from the closest property boundaries; or
- Structure generates 0 to 15 kW of electricity and is greater than 36 feet in height. No part of the wind energy structure can extend closer than one times the height of the wind tower to the top of the blade from the installation site to the nearest property boundaries. Noise cannot exceed 60 decibels from the closest property boundaries.

⁶ Source Document #4. Zoning Practice, Issue Number Seven, *Practice Renewable Energy*. Page 3.

⁷ See note 4.

F. Small Wind Energy Systems Subject to Site Plan Review

All other small wind energy systems (>15 to 100 kW), where accessory structures are allowed, are proposed to be permitted in all zones subject to site plan review and certain supplemental criteria:

1. Setbacks

No part of the wind energy system structure may extend closer than one times the height of the wind tower to the top of the turbine blade from the installation site to the nearest property boundaries.

2. Noise

Wind energy systems shall not exceed 60 decibels, as measured at the nearest property boundaries. The noise level, however, may be exceeded during short-term events such as utility outages and/or severe storms.

3. Lighting

A wind tower or wind energy system shall not be artificially lighted unless such lighting is required by the Federal Aviation Administration (FAA).

4. Signs

All signs, both temporary and permanent are prohibited, except as follows:

- Manufacturer's or installer's identification on the wind generator; or,
- Appropriate warning signs and placards.

5. Approved Wind Energy Generator

Wind turbines must have been approved by Oregon Department of Energy or any other wind energy certification programs recognized by the American Wind Energy Association.

6. Building Code

- All wind energy systems shall comply with the currently adopted edition of the Oregon Structural Specialty Code, or if accessory to a single family dwelling, the Oregon Residential Specialty Code; and
- Compliance with the National Electrical Code: Electrical permit applications shall be accompanied by a one-line diagram showing the system components and size and type of equipment in sufficient detail to demonstrate compliance with the current edition of the National Electrical Code.

7. Compliance with FAA Regulations

Wind energy systems must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.

8. Utility Notification

Wind energy systems shall not be installed until evidence has been given to the Planning Division that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

9. Aesthetics

Color of the wind energy system shall be either an unobtrusive stock color from the manufacturer or painted in a non-reflective, unobtrusive color that blends in with the surrounding environment.

10. Conditional of Approval Agreement

Prior to issuance of a building permit, the property owner shall record a "*Condition of Approval Agreement*" for protection of public health and safety reasons against the property that certifies the wind energy system will be removed, at the property owner's sole expense, when use has been discontinued from operating for more than one (1) year.

REVIEW CRITERIA

Ordinance No. 2011-009 creates an approval process an applicant/property owner must follow to site a small wind energy system. Deschutes County lacks specific criteria in DCC Titles 18, 22, or 23 for reviewing a legislative amendment. Nonetheless, because this is County initiated, staff bears the responsibility for justifying that the amendments are consistent with Deschutes County's Comprehensive Plan. Staff is also providing information regarding compliance with the statewide planning goals.

FINDINGS

G. Statewide Planning Goals.

The parameters for evaluating these specific amendments are based on an adequate factual base and supportive evidence demonstrating consistency with Statewide Planning Goals. The following findings demonstrate that Ordinance 2011-009 complies with applicable statewide planning goals.

1. Goal 1, Citizen Involvement is met through this adoption process because these amendments received four public hearings, three before the County Planning Commission, the County's citizen review board for land use matters, and one before the Board.

2. Goal 2, Land Use Planning is met because ORS 197.610 allows local governments to initiate post acknowledgments amendments. An Oregon Land Conservation and Development Department 45-day notice was initiated on July 12, 2010.⁸

3. Goal 3, Agricultural Lands is met because the code amendments apply to where accessory structures are already allowed, either as an outright permitted use or subject to site plan review and certain supplemental criteria. Additionally, as demonstrated below and

⁸ Deschutes County completed periodic review on January 23, 2003.

in response to other statewide planning goals, small wind turbines will not impact adjoining farm uses.

Noise

Most residential-sized wind generators are direct-drive devices with few moving parts. Unlike the utility-scale turbines used in wind farms, they do not have high-speed transmissions. Thus, most of the sound that comes from a residential sized wind turbine is aerodynamic noise caused by the blades passing through the air. The noise level of most modern residential turbines measures close to the ambient noise levels under average wind conditions. It is audible, if you are out of doors and listening for it.⁹ However, the ambient noise level of most modern residential wind turbines is around 52 to 55 decibels dB(A). This means that while the sound of the wind turbine can be picked out of surrounding noise if a conscious effort is made to hear it, a residential size wind turbine is no noisier than your average refrigerator.¹⁰

Electronic Interference

Small wind turbine generators have never been shown to disrupt telecommunications or radio wavers through electromagnetic interference. Jim Green of the U.S. Department of Energy's National Renewable Energy Laboratory reports that in 10 years researching small wind turbines, he has never encountered a problem with electromagnetic interference, nor have other researchers found cause to study them.¹¹

Lighting

The code amendments prohibit lighting unless the FAA requires it. The FAA does not require lights on structures less than 200 feet tall unless the proposed tower is within:

- 20,000 feet of an airport with at least one runway more than 3,200 feet in length and the object would exceed a slope of 100:1 horizontally from the nearest point of the nearest runway; or
- 10,000 feet of an airport that does not have a runway more than 3,200 feet in length and the object would exceed a slope of 50:1 from the nearest point of the nearest runway.¹²

4. Goal 4, Forest Lands is met because the code amendments apply to where accessory structures are already allowed, either as an outright permitted use or subject to site plan review and certain supplemental criteria. Small wind energy systems will not extend beyond property lines so they won't interfere with access to merchantable timber. They would be located near the residential use so would not be in the area on the property where forestry practices such as planting or cutting trees would take place.

5. Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces is met as demonstrated by the following findings:

⁹ Source Document #5. Small Wind Factsheet - Noise.

¹⁰ See note 3. Page 3.

¹¹ Source Document #6. Permitting Small Wind turbines: A Handbook, Learning from the California Experience.

Page 14.

¹² Ibid. Page 17.

As summarized earlier, Ordinance No. 2011-009 establishes an approval process to allow small wind energy systems, including wind towers for non-commercial use that generate less than 100 kW. Small wind energy systems must be accessory to the primary use of a property.

Avian Risk

- Bird collisions with small wind turbines are very rare. Statistically, a sliding glass door is a greater threat to birds than a small, unlighted wind turbine. Smokestacks, power lines, and radio and television towers have been associated with far greater numbers of bird fatalities than have even large-scale wind farms. Motor vehicles and pollution are responsible for an even higher proportion of total bird deaths. House cats kill an estimated 100 million birds annually.¹³
- Because small wind turbines have small rotor swept areas, they are not usually tall enough to interfere with bird migration patterns, and are not often installed in dense enough configurations to create a “wind-wall” effect, they generally do not cause problems with birds or wildlife.¹⁴
- California’s recent experience lends credibility to Deschutes County’s approach to limiting avian risk. In 2001, the California chapter of the National Audubon Society endorsed the passage of AB 1207 (Streamlining the Permitting of Small Wind Turbines in California), stating that the number of bird collisions with small-scale turbines is expected to be “similar to the deaths caused by other stationary objects that birds routinely fly into.”¹⁵
- Lastly, the FAA does not require lighting on towers less than 200 feet, demonstrating that the federal government does not require these type of structures to mitigate avian risk.¹⁶

Historical Resources

- Deschutes County’s regulations already require historic preservation of those Goal 5 inventory sites regardless of the use proposed for any given property.

Open Space / Scenic Views

The appearance of a turbine is an aesthetic issue, and one that is readily and easily controlled by the amendments as demonstrated below without impacting effectiveness.

- Color: Wind energy system shall be either an unobtrusive stock color from the manufacturer or painted in a non-reflective, unobtrusive color that blends in with the surrounding environment.
- Signs: All signs, both temporary and permanent are prohibited, except manufacturer’s or installer’s identification on the wind generator, or, appropriate warning signs and placards.

¹³ Id. Pages 15 - 16.

¹⁴ Id. Page 16

¹⁵ Id. Letter from John McCaull, California Audubon, to California Assemblyman John Longville, July 17, 2001.

¹⁶ Source Document #7. *Small Wind Factsheet - Birds*.

- Removal: Prior to issuance of a building permit, the property owner is required to record a “*Condition of Approval Agreement*” against the property that certifies the wind energy system will be removed, at the property owner’s sole expense, when use has been discontinued from operating for more than one (1) year.

6. Goal 6 Air, Water and Land Resources Quality is met as demonstrated by the following findings:

- Air quality has a direct impact on human health. Particulate matter in the air, often as a result of power plant emissions, has been shown to affect cardiovascular and respiratory health. Unhealthy levels of particle pollution can even cause otherwise healthy people to get sick.¹⁷
- The generation of electricity from the wind does not result in any air emissions. By offsetting more polluting forms of energy generation, wind energy can actually improve air quality and our health. The U.S.’s total 2009 wind turbine fleet prevents the emission of 200,000 metric tons of sulfur dioxide annually and 80,000 metric tons of nitrogen oxides annually.
- The entire fleet of wind turbines operating in the United States as of the end of 2009 will prevent the emission of over 57 million tons of carbon dioxide – a greenhouse gas that contributes to climate change – each year.¹⁸
- Wind turbines are just one option for renewable “green” energy. The US Department of Energy hopes to see 100GW of win electricity in use by 2020 which would equal 3 quadrillion BTUs of primary energy (fossil fuels/hydro electricity) annually and represents a reduction of 65 million metric tons of carbon.¹⁹
- Wind energy produces less than two percent of the emissions from coal combustion per megawatt-hour, even when the manufacturing process of wind turbines is accounted for, giving it one of the lowest greenhouse gas lifecycle emissions levels of any power technology.²⁰

7. Goal 7, Natural Hazards is met because unlike tree branches, wind turbine blades are designed to withstand a heavy load of ice. When ice builds up on the blades, they simply do not “fly” any more - they loose their aerodynamic properties. In fact, an ice-covered rotor will turn so slowly (at only several revolutions per minute) that there is no danger of ice being “thrown” off. Typically, the ice melts and falls - straight down - to the base of the tower.²¹ Small wind energy systems, accessory to the primary use of a property are proposed to be permitted outright, subject to three conditions or subject to site plan review. Building code requirements demonstrate that the County is committed to constructing small wind energy systems so they are structurally sound.

¹⁷ American Lung Association. (2010). State of the Air: 2010. <http://www.stateoftheair.org/2010/health-risks/health-risks-particle.html>

¹⁸ WINDPOWER OUTLOOK 2010

¹⁹ *Source Document #8. Report to Planning Advisory Committee*, City of Windsor, California. Page 4

²⁰ Kempton, W. & Levy, J. (2007). Harvard School of Public Health. <http://www.ocean.udel.edu/windpower/DE-Qs/IRP-KempLevy-Health.pdf>

²¹ *Source Document #9. Small Wind Factsheet - Public Safety.*

8. Goal 8, Recreational Needs is not applicable because the proposed amendments permit small wind turbines throughout Deschutes County, where accessory uses are allowed.

9. Goal 9, Economic Development is met as demonstrated below:

Job Creation

The proposed amendments will provide job opportunities through planning, installation, and maintenance of small wind turbines.

Investment

Small wind turbines are an attractive investment for residents in rural areas looking for relief from high energy costs. Small turbines also contribute a larger public benefit by reducing demand on utility systems now supplied primarily by centralized fossil-fuel plants.²² Distributed small wind energy systems also enhance the reliability and power quality of the power grid, reduce peak power demands, increase in-state electricity generation, diversify Oregon's energy supply portfolio and make the electrical supply market more competitive by promoting consumer choice.

Property Values

There is no documented evidence that wind turbines have ever lowered the values of surrounding properties. In fact, the opposite effect has been recorded. A recent study that examined 25,000 property transactions within five miles of wind farms found that values almost always rose faster in those areas than in similar communities without turbines.²³ The report, commissioned by the U.S. Department of Energy, included data from 10 wind installations in seven states.²⁴ Some homebuyers will pay more for a home equipped with a renewable energy system. A California Energy Commission market survey of 300 California homeowners found that half were willing to pay extra for homes with solar panels or wind turbines. The study also found that more than 60% of homeowners preferred to buy a home already equipped with a renewable energy system rather than install it themselves.²⁵

10. Goal 10, Housing is not applicable because the proposed text amendments will not affect the volume of housing in the county. The proposed amendments merely add to what a property owner can add to an existing dwelling or other permitted use needing electricity. For the same reason, DCC Chapter 23.56 is not applicable to these amendments.

11. Goal 11, Public Facilities is met because the proposed amendments permit small wind turbines throughout Deschutes County, where accessory uses are allowed. Energy production from these types of systems can contribute to the needs of Deschutes County if they are connected to the grid because, if the residential users have excess stored energy, they could provide a clean and efficient source of electricity to the public and private utilities and, thus, possibly reduce the overall cost to the public or private utility of producing such energy. As a result, those utilities may reduce the cost of electricity to they're customers.

²² See note 11. Pages 5 and 6.

²³ Ibid. Page 14

²⁴ Id.

²⁵ Id.

In June 2007, Oregon passed S.B. 838, which established a renewable portfolio standard for the state. That legislation requires the state's largest utilities to satisfy 25 percent of their load with new renewable energy sources by 2025. Eligible renewable resources include wind, solar, wave, geothermal, biomass, new hydroelectric, and efficiency upgrades to existing hydroelectric facilities. Additionally, small wind turbines is consistent with Goal 11 and the state mandate for utilities to provide 25% of their energy needs through renewable sources by the year 2025.²⁶

12. Goal 12, Transportation is not applicable because the proposed amendments permit small wind turbines throughout Deschutes County, where accessory uses are allowed.

13. Goal 13, Energy Conservation is met as demonstrated below:

Diversity Energy Supply

Small wind turbines can help diversity energy supply. Many small wind turbines are less vulnerable to attack than a centralized plant. If a storm, system overload, or terrorism event shuts down energy grids, small wind turbines can provide dispersed backup. One of the least expensive alternatives for small increases in grid energy capacity is to allow small-scale producers, since they, rather than the utility, purchase and maintain the infrastructure. Such investments may delay or reduce the need for major capital investments by the utility.²⁷

Energy Production

Energy production from small wind turbines, as noted in the Goal 11 finding, can contribute to the needs of Deschutes County if they are connected to the grid. In a normal residential application, a home is served simultaneously by a small wind turbine and a local utility. If the wind speeds are below cut-in speed (7-10 mph) there will be no output from the turbine and all of the needed power is purchased from the utility. As wind speeds increase, turbine output increases and the amount of power purchased from the utility is proportionately decreased. When the turbine produces more power than the house needs, the extra electricity is sold to the utility. A wind turbine can low an electricity bill by 50 to 90 percent. It is not uncommon for wind turbine owners with total-electric homes to have monthly utility bills of only \$8 to \$15 for nine months of the year.²⁸

H. Deschutes County Comprehensive Plan Goals and Policies

The following chapters in the Comprehensive Plan contain goals and/or policies that require findings demonstrating that the small wind energy text amendments remain consistent with them.

1. DCC 23.24.020 and 23.24.030, Rural Development is met because the text amendments continue to preserve and enhance the safety and viability of rural land uses. As demonstrated above, small wind energy systems reduce potential negative land use impacts as much as possible without reducing the function of those systems. Small wind energy systems, accessory to the primary use of a property are proposed to be permitted

²⁶ In 2007, state legislators passed a renewable energy mandate that 25 percent of Oregon's energy had to come from wind, solar, geothermal, wave and other renewable sources by 2025.

²⁷ See note 6. Page 4.

²⁸ The amount of money a small wind turbine saves in the long run depend upon its cost, the amount of electricity you use, the average wind speed at your site, and other factors.

outright, subject to three conditions or subject to site plan review. Setback, noise, lighting, signage, aesthetics, building code, and conditional approval agreement requirements demonstrate that the County is committed to integrating small wind energy systems in a manner that does not detract from adjoining or nearby rural land uses.

Applicable Rural Development Goals

- (A): preserve and enhance the open spaces, rural character, scenic values and natural resources of the County.
- (B): To guide the location and design of rural development so as to minimize the public costs of facilities and services, to avoid unnecessary expansion of service boundaries, and to preserve and enhance the safety and viability of rural land uses.

Applicable Rural Development Policies

- Other Policy (13): Construction on open lands shall be in a manner least intrusive to the aesthetic and natural character of those lands and neighboring lands (fences and access roads shall not be considered structures).
- Other Policy (18): All development in Deschutes County shall comply with all applicable state and federal rules, regulations and standards.

2. DCC 23.40.025, Urban Unincorporated Area, Sunriver is met because the text amendments conform with the requirements of OAR 660, Division 22 because a small wind energy system must be accessory to the primary use of a property. Additionally, due to their scale, they do not impact adjoining forest uses on forest land. As demonstrated above, small wind energy systems reduce potential negative land use impacts as much as possible without reducing the function of those systems. Small wind energy systems, accessory to the primary use of a property are proposed to be permitted outright, subject to three conditions or subject to site plan review. Setback, noise, lighting, signage, aesthetics, building code, and conditional approval agreement requirements demonstrate that the County is committed to integrating small wind energy systems in a manner that does not detract from adjoining or nearby rural land uses. Furthermore, Deschutes County Code, Chapter 18 applies a 100' riparian setback, measured from ordinary high water, for any structure adjoining the Deschutes River.

Applicable Sunriver Urban Unincorporated Area Policies

- General Land Use Policy (1): Land use regulations shall conform to the requirements of OAR 660 Division 22 or any successor.
- General Land Use Policy (2): County comprehensive plan policies and land use regulations shall ensure that new uses authorized within the Sunriver Urban Unincorporated Community do not adversely affect forest uses in the surrounding Forest Use Zones.
- General Land Use Policy (3): To protect scenic views and riparian habitat within the community, appropriate setbacks shall be required for all structures built on properties with frontage along the Deschutes River.

3. DCC 23.40.030, Terrebonne Rural Community is met by applying the same finding addressing DCC 23.40.025, Urban Unincorporated Area, Sunriver.

Applicable Terrebonne Rural Community Policies

- General Land Use Policy (1): Land use regulations shall conform to the requirements of OAR Chapter 660, Division 22 or its successor.
- General Land Use Policy (2): County plans and land use regulations shall ensure that new uses authorized within the Terrebonne Rural Community do not adversely affect agricultural uses in the surrounding Exclusive Farm Use (EFU) zones

4. DCC 23.40.030, Tumalo Rural Community is met by applying the same finding addressing DCC 23.40.025, Urban Unincorporated Area, Sunriver.

Applicable Tumalo Rural Community Policies

- General Land Use Policy (1): Land use regulations shall conform to the requirements of OAR Chapter 660, Division 22 or its successor.
- General Land Use Policy (2): County plans and land use regulations shall ensure that new uses authorized within the Tumalo Rural Community do not adversely affect agricultural uses in the surrounding Exclusive Farm Use (EFU) zones

5. DCC 23.40.040, Rural Service Centers – Alfalfa, Brothers, Hampton, Millican, Whistlestop and Wildhunt is met by applying the same finding addressing DCC 23.40.025, Urban Unincorporated Area, Sunriver.

Applicable Rural Service Center Policy

- General Land Use Policy (7): Zoning in the area shall promote the maintenance of the area's rural character.

6. DCC 23.40.050, Resort Communities – Black Butte Ranch and Inn of the Seventh Mountain/Widgi Creek is met by applying the same finding addressing DCC 23.40.025, Urban Unincorporated Area, Sunriver.

7. DCC 23.40.060, Rural Commercial – Deschutes Junction, Deschutes River Woods Store, Pine Forest, Rosland and Spring River is met by applying the same finding addressing DCC 23.40.025, Urban Unincorporated Area, Sunriver.

8. DCC 23.52.020 and 23.520.030, Economy is met by applying the same findings addressing Goal 3, Agriculture.

Applicable Economy Goals

- (1): To diversify and improve the economy of the area.
- (2): To enhance and maintain the existing natural resource, commercial and industrial segments of the local economy.

Applicable Economy Policy

- Natural Resource Policy (2a): The County shall protect agricultural land to assure continued agricultural production and the benefits to tourism

9. DCC 23.68.030, Public Facilities and Services is met by applying the same findings addressing Goal 11, Public Facilities.

Applicable Public Facility and Service Policy

- Other (8c). All development in Deschutes County shall comply with all applicable state and federal rules, regulations and standards.

10. DCC, 23.76.020 and 23.76.030, Energy is met because the small wind energy text amendments are consistent with the relevant goals and policies cited below which recognize that energy conservation can reduce pollution, free existing energy resources for other uses and reduce the outflow of money for energy.²⁹ Deschutes County's Energy Goals recognize local energy, land uses that can conserve energy, and the importance of assisting in the provision for adequate local energy supplies. Wind energy, harnessed by small wind turbines meets all three of these goals, including the two related energy policies. The County's energy policies promote development that can use local energy sources, including wind. Small wind energy systems do not constitute "major" wind devices as cited in Policy 3a, typically associated with commercial scale projects near the Columbia River. Nonetheless, site plan review is required for small wind energy systems when certain thresholds are met.

Applicable Energy Goals

- (1): To protect local natural energy sources.
- (2): To manage land uses to maximize the conservation of all forms of energy.
- (3): To assist, as appropriate, in the provision for adequate local energy supplies.

Applicable Energy Policies

- General Policy (1a): The County shall review and promote the development and use of local alternative energy sources in order to prepare for future shortages and to reduce the outflow of local dollars to buy energy; and,
- Alternative Energy Sources - Wind (3a): Because the wind is a non-polluting, renewable energy source, major wind devices and associated facilities shall be conditional uses in agricultural, forest and other rural zones. Also, small scale (less than 20 KW) private use of wind generators or pumps shall be encouraged.

11. DCC 23.80.030, Natural Hazards is met by applying the same findings addressing Goal 7, Natural Hazards.

Applicable Natural Hazard Policy

- Fire (4k). All development in Deschutes County shall comply with all applicable state and federal rules, regulations and standards.

12. DCC 23.88.020, Agricultural Lands is met by applying the same findings addressing Goal 3, Agricultural Lands.

Applicable Agricultural Lands Goal

- (1): To preserve and maintain agricultural land.

13. DCC 23.92.020 and 23.92.030, Forest Lands is met by applying the same findings addressing Goal 4, Forest Lands.

²⁹ Source Document #10. DCC 23.76, Energy.

Applicable Forest Lands Goal

- (1): To conserve forest lands for forest uses.

Applicable Forest Land Policies

- (2): Deschutes County shall zone forest lands for uses allowed pursuant to OAR 660, Division 6. In addition to forest practices and operations and uses auxiliary to forest practices, as set forth in ORS 527.722, Deschutes County shall allow in the forest environment the following general types of uses:
 - (2d) Dwellings authorized by ORS 215.720 to 215.750;

14. DCC 23.96.020 and 23.96.030, Open Space, Areas of Special Concern, and Environmental Quality is met by applying the same findings addressing Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces. A small wind energy system must be accessory to the primary use of a property. As demonstrated above, small wind energy systems reduce potential negative land use impacts as much as possible without reducing the function of those systems. Setback, noise, lighting, signage, aesthetics, building code, and conditional approval agreement requirements demonstrate that the County is committed to integrating small wind energy systems in a manner that does not detract from open space, areas of special concern and environmental quality.

Furthermore, Deschutes County Code, Chapter 18 applies a 100' riparian setback and wetland measures, for any structure adjoining streams or impacting wetlands designated on the National Wetland Inventory. Within the Landscape Management Zone, new structures or additions to existing structures are subject to landscape management site plan review prior to issuance of a building permit.

Applicable Open Space, Areas of Special Concern, and Environmental Quality Goals

- (1): To conserve open spaces and areas of historic, natural or scenic resources.
- (2): To maintain and improve the quality of the air, water and land resources of Deschutes County. However, despite general consensus that the environmental quality and amenities are important to this area's people, as well as to people statewide, there is also concern that regulation and policies to protect that environment could become too restrictive. The following policies have been developed with the intent of reaching the identified goals but in ways that restrict only as is necessary and with consideration of the individuals who may be affected by the needs of the public.

Applicable Open Space, Areas of Special Concern, and Environmental Quality Policies

- Policy (3): Within the Landscape Management Zone, new structures or additions to existing structures (excluding fences or structures less than \$1,000.00 in total value) shall be subject to landscape management site plan review by the County prior to issuance of a building permit.
- Policy (4): Approval of any such development in the Landscape Management Zone will be dependent on site screening by existing natural cover and/or compatibility with the landscape as seen from the river, stream or road.
- Policy (5): Outdoor advertising signs should be informational only and oversized displays discouraged.

- Policy (6): The primary purpose of the landscape management site plan review shall be to obtain a structure as compatible with the site and existing scenic vistas as is possible, rather than to establish arbitrary standards for appearance or to otherwise restrict construction of appropriate structures.
- Policy (7): Rimrocks, along streams shall receive special review to assure that visual impacts of structures viewed from rivers or streams are minimized. A 50-foot setback shall be required from rimrocks on all newly created lots. Existing lots may receive exceptions to rimrock setbacks subject to conformance with criteria which individually review the structure, location and consider impacts in a manner which minimize the visual impact of the structure when viewed from the river or stream.
- Policy (10): As part of subdivision or other development review the County shall consider the impact of the proposal on the air, water, scenic and natural resources of the County. Specific criteria for such review should be developed. Compatibility of the development with those resources shall be required as deemed appropriate at the time given the importance of those resources to the County while considering the public need for the proposed development.
- Policy (12): Zoning should be established to protect areas of special interest such as eagle nests, endangered species areas or points of geologic interest.

15. DCC 23.104.020 and 23.104.030, Fish and Wildlife is met by applying the same findings addressing Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces. A small wind energy system must be accessory to the primary use of a property. As demonstrated above, small wind energy systems reduce potential negative land use impacts as much as possible without reducing the function of those systems. Setback, noise, lighting, signage, aesthetics, building code, and conditional approval agreement requirements demonstrate that the County is committed to integrating small wind energy systems in a manner that does not detract from open space, areas of special concern and environmental quality.

Furthermore, Deschutes County Code, Chapter 18 applies a 100' riparian setback and wetland measures, for any structure adjoining streams or impacting wetlands designated on the National Wetland Inventory. Within the Landscape Management Zone, new structures or additions to existing structures are subject to landscape management site plan review prior to issuance of a building permit. The County also administers a Wildlife Combining Zone and a Sensitive Bird and Mammal Habitat Combining Zone. Residential uses are permitted outright in both zones. Setbacks are determined by the underlying zone. Site plan review is required for any new structure within the Sensitive Bird and Mammal Habitat Combining Zone.

Applicable Fish and Wildlife Goals

- (1): To conserve and protect existing fish and wildlife areas.
- (2): To maintain all species at optimum levels to prevent serious depletion of indigenous species.
- (3): To develop and manage the lands and waters of this County in a manner that will enhance, where possible, the production and public enjoyment of wildlife.
- (4): To develop and maintain public access to lands and waters and the wildlife resources thereon.

- (5): To maintain wildlife diversity and habitats that support the wildlife diversity in the County.

Applicable Fish and Wildlife Policy

Policy (5): . . . in order to protect the sensitive riparian areas, as well as to protect people and property from flood damage, the zoning ordinance shall prohibit development (except floating docks) within 100 feet of the mean high water mark of a perennial or intermittent stream or lake.

16. DCC 23.108.020 and 23.108.030, Historic and Cultural is met by applying the same findings addressing Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces.

Applicable Historic and Cultural Goal

- (1): To preserve and protect historic and cultural resources of Deschutes County.

Applicable Historic and Cultural Policy

- Policy (2): Preservation of historic and cultural sites of high priority rating or that have been identified on the Deschutes County Inventory of Historical Places should take precedence over other developmental uses.

17. DCC 23.116.050 and DCC 23.116.060 Deschutes River Corridor is met by applying the same findings addressing Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces; DCC 23.96.020 and 23.96.030, Open Space, Areas of Special Concern, and Environmental Quality; and DCC 23.104.020 and 23.104.030, Fish and Wildlife.

Applicable Deschutes River Corridor Goal

- (DCC 23.116.050 - Goal 1) Ensure the long-term protection and enhancement of wildlife sensitive riparian habitat, and natural plant and animal communities along the Deschutes River and its tributaries.
- DCC 23.116.050 Policy (2): Deschutes County shall adopt regulations pertaining to fill-and-removal of material in waterways and adjacent wetlands.
- DCC 23.116.060 Policy (2a): Deschutes County shall include areas along the Deschutes River, Little Deschutes River, Crooked River, Spring River, Fall River, Tumalo Creek, Paulina Creek and Whychus Creek into the Landscape Management (LM) zone.

18. DCC 23.124.020 Citizen Involvement is met by applying the same findings addressing Goals 1 and 2.

Applicable Citizen Involvement Goal

- (A): To promote and maintain better communication between the community's various segments (i.e., governmental agencies, business groups, special districts and the general public).
- (B): To provide the opportunity for the public to identify issues of concern and encourage their involvement in planning to addresses those issues.
- (C): To serve as a liaison between elected and appointed bodies and citizens of the county.

- (D): To provide educational opportunities for the people to learn about planning and how it may be used to assist their community and themselves.

3. Conclusion

Deschutes County's proposed amendments continue to protect agricultural and forest lands, and air quality, while recognizing the importance of economic development, public facilities, and energy conservation. Winter storms and the prevalence of snow accumulation are also appropriately addressed to satisfy natural hazards. Wind energy is an abundant, renewable and nonpolluting energy resource and its conversion to electricity will reduce dependence on nonrenewable energy resources and decrease the air and water pollution that results from the use of conventional energy sources. Wind energy systems also enhance the reliability and power quality of the power grid, reduce peak power demands and help diversify the Oregon's energy supply portfolio. A healthy and sustainable environment represents a balance between human activities and natural features and functions. The proposed amendment can lead to projects that reduce pollution and improve air quality, while also controlling for perceived nuisances associated with noise and aesthetics.

Source Documents

1. *Small Wind Electric Systems, An Oregon Guidebook*. Produced for the U.S. Department of Energy by the National Renewable Energy Laboratory, a DOE national laboratory. DOE/GO-102007-2463. August 2007.
http://www.windpoweringamerica.gov/pdfs/small_wind/small_wind_or.pdf;
2. *Ask the Author*, American Planning Association, August 2008.
<http://www.planning.org/zoningpractice/ask/2008/aug.htm>
3. *Overcoming Barriers, Expanding the Market for Small Wind Energy Systems*, American Wind Energy Association Resource Library. 2002
<http://www.awea.org/pubs/documents/small%20wind%20102-104-optimized.pdf>
4. Zoning Practice, Issue Number Seven, *Practice Renewable Energy*, American Planning Association. July 2008.
<http://apps.opkansas.org/City-Government/Agendas-and-Minutes/Community-Development/Agendas/2009/2009-06-03/DIS-1-3.pdf>
5. *Small Wind Factsheet - Noise*, American Wind Energy Association Resource Library.
http://www.awea.org/smallwind/toolbox2/INSTALL/factsheet_noise.pdf
6. *Permitting Small Wind turbines: A Handbook, Learning from the California Experience*. American Wind Energy Association's Small Wind Advocate Team. September 2003
http://www.consumerenergycenter.org/erprebate/documents/awea_permitting_small_wind.pdf
7. *Small Wind Factsheet - Birds*, American Wind Energy Association Resource Library.
http://www.awea.org/smallwind/toolbox2/factsheet_kill_birds.html
8. *Report to Planning Advisory Committee*, City of Windsor, California. July 21, 2005.
<http://www.citywindsor.ca/documents/ReporttoPlanningAdvisoryCommittee.pdf>
9. *Small Wind Factsheet - Public Safety*, American Wind Energy Association Resource Library.
http://www.awea.org/smallwind/toolbox2/factsheet_public_safety.html
10. Deschutes County Code, 23.76, Energy.
<http://www.co.deschutes.or.us/dccode/title23/docs/chapter%2023.76.doc>