City of Grand Island

Tuesday, May 11, 2010
Council Session

Item E1

Public Hearing on Text Amendment to Chapter 36-103 of the Grand Island City Code Relative to Wind Energy Systems

Staff Contact: Chad Nabity

Council Agenda Memo

From: Regional Planning Commission

Meeting: May 11, 2010

Subject: Concerning Amendments to the Zoning Ordinance for the City of Grand Island and its 2 Mile Extra-Territorial Jurisdiction. (C-13-2010All)

Item #'s: E-1 & F-1

Presenter(s): Chad Nabity AICP, Regional Planning Director

Background

Concerning amendments to the Zoning Resolution the City of Grand Island and its 2 mile extra-territorial jurisdiction. Changes are being proposed to the following sections of each resolution or ordinance: Wind Energy Systems sections Grand Island (§36-103 Wind Energy Systems), the proposed changes will repeal the existing regulations and replace them with updated regulations including micro, small and commercial wind energy conversion systems and regulations to allow all three sizes under differing circumstances.

Discussion

At the regular meeting of the Regional Planning Commission, held April 7, 2010, the above item was considered following a public hearing.

From the Planning Commission Meeting:

O'Neill opened the Public Hearing.

Nabity explained the request concerning amendments Wind energy is an evolving technology that is impacting land use in central Nebraska. It is now possible to buy a 600W wind turbine at Menards. It is inevitable that people will begin putting up wind generation units. We need to have regulations in place that define how and where this can be done before people put them up.

The regulations for the City of Grand Island were modified in 2009 to accommodate the changing technology and staff is recommending additional changes. The regulations regarding wind energy systems for Hall County, Wood River, Alda, Cairo and Doniphan

have not been modified since they were adopted in 2004. Planning Commission Staff is recommending similar regulations for all of the entities served by the Hall County Planning Department. Each entity will have the opportunity to review, modify and potentially adopt these regulations. These regulations will define 3 types of wind energy systems based in the generation capacity and the size of the units. Some form of wind generation would be permitted in all zoning districts.

Jeff Berggren with Husker Wind Power in Grand Island expressed support for the regulations as they are written. These regulations would allow reputable wind energy companies to serve their clients in a responsible manner. Mr. Berggren set up a micro wind generation unit at the meeting so that Planning Commission members could see what one would look like. Mr. Berggren also made the point that these systems are not designed to sell a substantial amount of power back to the grid but rather to lower the consumption of electricity purchased by the property owner.

Wind Energy Conversion Systems:

Micro Wind Energy Conversion Systems:

Micro Wind Energy Conversion System (MWECS) shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 5 kW and which is intended to primarily reduce on-site consumption of utility power. Rotor Diameter shall not exceed 7 feet.

MWECS would be allowed in all zoning districts and on all lots with a permitted principal use as long as the system as constructed conforms to the standards defined in the regulations. There is no maximum height limitation, but height would be limited by fall zone and FAA regulations and impact on nearby regulated airports. Wind Turbines with a rotor diameter of greater than 7 feet but rated capacities of less than 5kW would be considered small wind energy conversion systems.

Small Wind Energy Conversion Systems

Small Wind Energy Conversion System (SWECS) shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity not less than 5 kW and not more than 100 kW or has a rated capacity of not more than 5 kW and a rotor diameter of greater than 7 feet and which is intended to primarily reduce on-site consumption of utility power.

SWECS would be allowed in all zoning districts and on all lots with a permitted principal use as long as the system as constructed conforms to the standards defined in the regulations. There is no maximum height limitation, but height would be limited by fall zone and FAA regulations and impact on nearby regulated airports.

Setbacks for MWECS an SWECS

The setbacks for MWECS and SWECS are determined by the fall zone. Fall zone is a function of the height of the tower and the underlying zoning setbacks. Tower height is differentiated based on whether the tower is mounted on building or on the ground.

(N) **Tower Height (Ground Mounted)** shall mean the total height of the Wind Energy Conversion System, between the ground level at the base of the tower and the top of the tower, exclusive of the rotor blades.

(O) **Tower Height (Roof Mounted)** shall mean the total height of the Wind Energy Conversion System, between the roof level at the base of the tower and the top of the tower, exclusive of the rotor blades.

The fall zone for ground mounted towers is the height of the tower plus the underlying setback. The fall zone for roof mounted towers is 125% of the height of the tower plus the underlying setback for MWCES and 150% of the height of the tower plus the underlying setback for SWCES.

Commercial Wind Energy Conversion Systems (WECS)

Commercial Wind Energy Conversion System (WECS) shall mean a wind energy conversion system of equal to or greater than 100 kW in total name plate generating capacity.

WECS are also allowed under these regulations in the following zoning districts based on entity with jurisdiction. These are not allowed in every zoning district. They are primarily allowed in the Agricultural and Transitional Agriculture Zones. A full listing of the zones where they would be allowed is included below. A WECS would be any system that generates more than 100KW. These would need to meet all of the requirements in the regulations and receive a conditional use permit prior to beginning construction.

Grand Island

Commercial/Utility Grade wind energy systems shall be a Conditional Use within the AG-2 Secondary Agricultural District, the TA Transitional Agriculture District, the AG-SI Special Agriculture/Industrial Zone, AG-SE Special Agriculture District/Events Zone, and the AG-SC Special Agriculture District/Conservation Zone.

Recommendation

A motion was made by Bredthauer to recommend approval to all entities, the Text Amendment pertaining to Wind Energy Systems sections for Hall County (§6.03 Wind Energy Installation), Grand Island (§36-103 Wind Energy Systems), Wood River, Alda, Doniphan and Cairo (§7.15 Wind Energy Systems) and seconded by Aguilar, to recommend approval as presented.

A roll call vote was taken and the motion passed with 10 members present, 10 voting in favor (O'Neill, Ruge, Haskins, Hayes, Aguilar, Reynolds, Monter, Bredthauer, Connelly, Snodgrass) and no member present voting against.

Sample Motion

Move to approve the ordinance to the Text Amendment pertaining to Grand Island (§36-103 Wind Energy Systems).

Proposed Changes to Regulations for Hall County, Grand Island, Wood River, Alda, Cairo and Doniphan

(These are numbered for the Grand Island Code but would be renumbered for the appropriate jurisdiction at the time of adoption. The requirements for a commercial WECS are to be modified for Hall County, Wood River, Alda, Cario and Doniphan as indicated by the footnote in that section.)

36-103. Wind Energy Conversion Systems

Definitions

The following are defined for the specific use of this section.

(A) **Aggregate Project** shall mean projects that are developed and operated in a coordinated fashion, but which have multiple entities separately owning one or more of the individual WECS within the larger project. Associated infrastructure such as power lines and transformers that service the facility may be owned by a separate entity but are also part of the aggregated project.

(B) **Commercial WECS** shall mean a wind energy conversion system of equal to or greater than 100 kW in total name plate generating capacity.

(C) **Connector Line** shall mean any power conductor that carries electrical power from one or more wind turbines to the point of interconnection with the distribution system.

(D) **Hub Height** shall mean the distance from ground level as measured to the centerline of the rotor.

(E) **Meteorological Tower** shall mean, for purposes of this regulation, a tower which is erected primarily to measure wind speed and directions plus other data relevant to siting a Wind Energy Conversion System. Meteorological towers do not include towers and equipment used by airports, the Nebraska Department of Roads, or other applications to monitor weather conditions.

(F) **Micro Wind Energy Conversion System (MWECS)** shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 5 kW and which is intended to primarily reduce on-site consumption of utility power. Rotor Diameter shall not exceed 7 feet.

(G) **Property Line** shall mean the boundary line of the area over which the entity applying for a Wind Energy Conversion System permit has legal control for the purpose of installing, maintaining and operating a Wind Energy Conversion System.

(H) **Public Conservation lands** shall mean land owned in fee title by State or Federal agencies and managed specifically for conservation purposes, including but not limited to State Wildlife Management Areas, State Parks, federal Wildlife Refuges and Waterfowl Production Areas. For purposes of this regulation, public conservation lands will also include lands owned in fee title by non-profit conservation organizations, Public conservation lands will also include private lands upon which conservation easements have been sold to public agencies or non-profit conservation organizations.

(I) **Rotor Diameter** shall mean the diameter of the circle described by the moving rotor blades.

(J) **Small Wind Energy Conversion System (SWECS)** shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity not less than 5 kW and not more than 100 kW or has a rated capacity of not more than 5 kW and a rotor diameter of greater than 7 feet and which is intended to primarily reduce on-site consumption of utility power.

(K) **Substations** shall mean any electrical facility to convert electricity produced by wind turbines to a higher or lower voltage for interconnection with transmission lines.

(L) **Total Height** shall mean the highest point, above ground level, reached by a rotor tip or any other part of the Wind Energy Conversion System.

(M) **Tower** shall mean the vertical structures, including the foundation that supports the electrical generator, rotor blades, or meteorological equipment.

(N) **Tower Height <u>(Ground Mounted)</u>** shall mean the total height of the Wind Energy Conversion System, between the ground level at the base of the tower and the top of the tower, exclusive of the rotor blades.

(O) **Tower Height (Roof Mounted)** shall mean the total height of the Wind Energy Conversion System, between the roof level at the base of the tower and the top of the tower, exclusive of the rotor blades.

(P) **Transmission Line** shall mean the electrical power lines that carry voltages of at least 69,000 volts (69 KV) and are primarily used to carry electric energy over medium to long distances rather than directly interconnecting and supplying electric energy to retail customers.

(Q) **Wind Energy Conversion System (WECS)** shall mean an electrical generating facility comprised of one or more wind turbines and accessory facilities, including but not limited to: power lines, transformers, substations and meteorological towers that operate by converting the kinetic energy of wind into electrical energy, which may be used on-site or distributed into the electrical grid.

(R) **Wind Turbines** shall mean any piece of electrical generating equipment that converts the kinetic energy of blowing wind into electrical energy using airfoils or similar devices to capture the wind.

(S) **Vertical Axis Wind Turbine**: A wind energy conversion system design where the rotating shaft is perpendicular to the ground and the cups or blades rotate parallel to the ground.

Micro Wind Energy Conversion Systems

Purpose

It is the purpose of this wind energy regulation to; promote the safe, effective and efficient use of wind energy and to encourage the development of residential scale generation systems as they become affordable as determined by the residents of Grand Island and Hall County.

Requirements

Residential wind energy conversion systems shall be permitted as an Accessory Use within any zoning district. Certain requirements as set forth below shall be met:

(A) Tower Height

(1) Shall be limited by the size of the property. Tower height shall not exceed the fall zone for the property.

(B) Minimum Lot Size

(1) Towers shall be permitted on all lots or parcels with a permitted principal use.

(C) Fall Zone

(1) Fall Zone is the total height and any underlying setbacks for ground mounted MWCES.

(2) Fall Zone is the 125% of the tower height and any underlying setbacks for roof mounted MWCES.

(D) Setbacks

(1) No part of the wind system structure, including guy-wire anchors, may extend closer than 10 feet to the property lines of the installation site; tower must meet required underlying setbacks.

(E) Noise

(1)\MWCES shall not exceed 60 dBA, as measured at the closet neighboring inhabited dwelling unit.

(2) The noise level may be exceeded during short term events such as utility outages and/or severe wind storms, wind speeds of greater than 50 miles per hour.

(F) Approved Wind Turbines

(1) MWCES must have been approved under the Emerging Technologies program of the California Energy Commission or any other small certification program recognized by the American Wind Energy Association.

(G) Compliance with Building and Zoning Codes

(1) Applications for MWCES shall be accomplished by standard drawings of the wind turbine structure, including the tower base, and footings.

(2) An engineering analysis of the tower showing compliance with official building code of the governing body and/or the State of Nebraska and certified by a licensed professional engineer shall also be submitted.

(H) Compliance with FAA Regulations

(1) MWCES must comply with applicable FAA regulations, including any necessary approvals for installations within the airport approach zone.

(2) No MWCES shall be installed within the regulated airport approach zone until evidence has been given that the Central Nebraska Regional Airport has been informed of the applicant's intent to install a MWECS. A copy of a certified letter (with mailing receipt) to the Central Nebraska Regional Airport informing them of the owners' intent to install the MWCES must be submitted with the building permit application.

(I) Compliance with National Electrical Code

(1) Permit applications for small wind energy systems shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code and the National Electric Safety Code.

(J) Utility Notification

(1) No small wind energy system shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator.

(2) Off- grid systems shall be exempt from this requirement.

Setbacks

Minimum setbacks from all property lines shall be equal to the Fall Zone as defining in C above.

Small Wind Energy Conversion Systems

Purpose

It is the purpose of this regulation to promote the safe, effective and efficient use of small wind energy systems installed to reduce the on-site consumption of utility supplied electricity.

Requirements

Small wind energy conversion systems shall be permitted as an Accessory Use within any district. Certain requirements as set forth below shall be met:

(A) Tower Height

(1) Shall be limited by the size of the property. Tower height shall not exceed the fall zone for the property.

(B) Minimum Lot Size

((1) Towers shall be permitted on all lots or parcels with a permitted principal use.

(C) Fall Zone

(1) Fall Zone is the total height and any underlying setbacks for ground mounted SWCES.

(2) Fall Zone is the 150% of the tower height and any underlying setbacks for roof mounted SWCES.

(D) Setbacks

(1) No part of the wind system structure, including guy-wire anchors, may extend closer than 10 feet to the property lines of the installation site; tower must meet required underlying setbacks.

(E) Noise

(1) SWCES shall not exceed 60 dBA, as measured at the closet neighboring inhabited dwelling unit.

(2) The noise level may be exceeded during short term events such as utility outages and/or severe wind storms, wind speeds of greater than 50 miles per hour.

(F) Approved Wind Turbines

(1) SWCES must have been approved under the Emerging Technologies program of the California Energy Commission or any other small certification program recognized by the American Wind Energy Association.

(G) Compliance with Building and Zoning Codes

(1) Applications for SWCES shall be accomplished by standard drawings of the wind turbine structure, including the tower base, and footings.

(2) An engineering analysis of the tower showing compliance with official building code of the governing body and/or the State of Nebraska and certified by a licensed professional engineer shall also be submitted.

(H) Compliance with FAA Regulations

(1) Small wind energy conversion systems must comply with applicable FAA regulations, including any necessary approvals for installations within the airport approach zones.

(2) No SWCES shall be installed within the regulated airport approach zone until evidence has been given that the Central Nebraska Regional Airport has been informed of the applicant's intent to install a SWECS. A copy of a certified letter (with mailing receipt) to the Central Nebraska Regional Airport informing them of the owners' intent to install the SWCES must be submitted with the building permit application.

(I) Compliance with National Electrical Code

(1) Permit applications for small wind energy systems shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code and the National Electric Safety Code.

(J) Utility Notification

(1) No small wind energy system shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator.

(2) Off- grid systems shall be exempt from this requirement.

Setbacks

Minimum setbacks from all property lines shall be equal to the Fall Zone as defining in C above.

Commercial/Utility Grade Wind Energy Conversion Systems

Purpose

It is the purpose of this regulation to promote the safe, effective and efficient use of commercial/utility grade wind energy conversion systems within the City of Grand Island and its Extraterritorial Zoning Jurisdiction.

Requirements

Commercial/Utility Grade wind energy systems shall be a Conditional Use within the AG-2 Secondary Agricultural District, the TA Transitional Agriculture District, the AG-SI Special Agriculture/Industrial Zone, AG-SE Special Agriculture District/Events Zone, and the AG-SC Special Agriculture District/Conservation Zone. The following requirements and information shall be met and supplied:

(A) The name(s) of project applicant.

(B) The name of the project owner.

(C) The legal description and address of the project.

(D) A description of the project including: Number, type, name plate generating capacity, tower height, rotor diameter, and total height of all wind turbines and means of interconnecting with the electrical grid.

(E) Site layout, including the location of property lines, wind turbines, feeder lines, and all related accessory structures. This site layout shall include distances and be drawn to scale.

(F) Certification by an Engineer competent in disciplines of WEC's.

(G) Documentation of land ownership or legal control of the property.

(H) The latitude and longitude of individual wind turbines; included with this shall be an area or zone in close proximity that meets all setbacks; where actual WEC will be considered.

(I) A USGS topographical map, or map with similar data, of the property and surrounding area, including any other Wind Energy Conversion System, within 10 rotor distances of the proposed Wind Energy Conversion System not owned by the applicant.

(J) Location of migratory waterfowl flyways, wetlands, scenic, and natural areas within 1,320 feet of the proposed Wind Energy Conversion System.

(K) An Acoustical Analysis that certifies that the noise requirements within this regulation can be met

(L) The applicant shall supply the emergency management agency and/or fire departments with a basic emergency response plan.

(M) FAA and FCC permit, if necessary.

(1) Commercial/Utility Grade wind energy conversion systems must comply with applicable FAA regulations, including any necessary approvals for installations within the airport zone.

(2) No WEC shall be installed within the regulated airport approach zone until evidence has been given that the Central Nebraska Regional Airport has been informed of the applicant's intent to install a SWECS. A copy of a certified letter (with mailing receipt) to the Central Nebraska Regional Airport informing them of the owners intent to install the SWCES must be submitted with the building permit application.

(N) Evidence that there will be no inference with any commercial and/or public safety communication towers.

(O) Decommissioning Plan as required by this regulation.

Setbacks

All towers shall adhere to the setbacks established in the following table:

	Wind Turbine- Commercial/Utility WECS	Meteorological Towers
Property Lines	150 feet from property lines; however, the setback may be less when two adjoining property owners are within the aggregate project.	One times the tower height.
Neighboring Dwelling Units	1,000 feet	One times the tower height.
Road Rights-of-Way*	One-half the rotor diameter.	One times the tower height.
Other Rights-of-Way	NA	NA
Wildlife Management Areas and State Recreational Areas	600 feet	600 feet
Wetlands, USFW Types III, IV, and V	600 feet	600 feet
Other structures and cemeteries adjacent to the applicant's sites	One-half the rotor diameter.	One times the tower height.
Other existing WECS not owned by the applicant.	NA	NA

* The setback shall be measured from any future Rights-of-Way if a planned change or expanded Right-of-Way is known.

Special Safety and Design Standards

All towers shall adhere to the following safety and design standards:

(A) Clearance of rotor blades or airfoils must maintain a minimum of 12 feet of clearance between their lowest point and the ground.

(B) All Commercial/Utility WECS shall have a sign or signs posted on the tower, transformer and substation, warning of high voltage. Other signs shall be posted on the tower base or perimeter fencing with emergency contact information.

(C) All wind turbines, which are a part of a commercial/utility WECS, shall be installed with a tubular, monopole type tower.

(D) Consideration shall be given to painted aviation warnings on all towers less than 200 feet.

(E) Color and finish:

All wind turbines and towers that are part of a commercial/utility WECS shall be white, grey, or another non-obtrusive color. Blades may be black in order to facilitate deicing. Finishes shall be matte or non-reflective.

(F) Lighting:

Lighting, including lighting intensity and frequency of strobe, shall adhere to but not exceed requirements established by the FAA permits and regulations. Red strobe lights shall be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds. Red pulsating incandescent lights should be avoided.

(G) Other signage:

All other signage shall comply with the sign regulations found in the City Code.

(H) Feeder Lines:

All communications and connector lines associated with the project distribution system installed as part of a WECS shall be buried. Where obstacles to the buried lines create a need to go above ground, these lines may be placed above ground only to miss the obstacle.

(I) Waste Disposal:

Solid and Hazardous wastes, including but not limited to crates, packaging materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site promptly and disposed of in accordance with all applicable local, state and federal regulations.

(J) Discontinuation and Decommissioning:

A WECS shall be considered a discontinued use after one year without energy production, unless a plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the WECS to service. All WECS and accessory facilities shall be completely

removed to twelve feet below ground level within 180 days of the discontinuation of use. The 180 days may be extended if proof of weather delays is provided.

Each Commercial/Utility WECS shall have a Decommissioning plan outlining the anticipated means and cost of removing WECS at the end of their serviceable life or upon use being discontinued. The cost estimates shall be made by a competent party; such as a Professional Engineer, a contractor capable of decommissioning or a person with suitable expertise or experience with decommissioning. The plan shall also identify the financial resources that will be available to pay for decommissioning and removal of the WECS and accessory facilities. The initial plan shall be submitted with the application. An updated plan shall be filed with the City every 5 years.

(K) Noise:

No Commercial/Utility WECS shall exceed 50 dBA at the nearest structure or use occupied by humans.

(L) Interference:

The applicant shall not cause interference with power quality of area utility feeder circuits and shall not introduce noise to the connected electric distribution system. WECS shall not cause interference with any commercial or public safety electromagnetic communications, such as radio, telephone, microwaves, or television signals. The applicant shall notify all electric utilities and communication tower operators within five miles of the proposed WECS location upon application for permits.

(M) Environmental Permits:

The developer shall present evidence the project meets the environmental permitting requirements of all applicable state and federal agencies if such permits are required.

(N) Drainage System:

The applicant shall be responsible for immediate repair of damage to public drainage systems stemming from construction, operation or maintenance of the WECS.

Current GI Wind Regs

§36-103. Wind Energy Conversion Systems

Definitions

The following are defined for the specific use of this section.

(A) **Aggregate Project** shall mean projects that are developed and operated in a coordinated fashion, but which have multiple entities separately owning one or more of the individual WECS within the larger project. Associated infrastructure such as power lines and transformers that service the facility may be owned by a separate entity but are also part of the aggregated project.

(B) **Commercial WECS** shall mean a wind energy conversion system of equal to or greater than 100 kW in total name plate generating capacity.

(C) **Connector Line** shall mean any power conductor that carries electrical power from one or more wind turbines to the point of interconnection with the distribution system.

(D) **Hub Height** shall mean the distance from ground level as measured to the centerline of the rotor.

(E) **Fall Zone** shall mean the area, defined as the furthest distance from the tower base, in which a guyed or tubular tower will collapse in the event of a structural failure. This area may be less than the total height of the structure.

(F) **Meteorological Tower** shall mean, for purposes of this regulation, a tower which is erected primarily to measure wind speed and directions plus other data relevant to siting a Wind Energy Conversion System. Meteorological towers do not include towers and equipment used by airports, the Nebraska Department of Roads, or other applications to monitor weather conditions.

(G) **Property Line** shall mean the boundary line of the area over which the entity applying for a Wind Energy Conversion System permit has legal control for the purpose of installing, maintaining and operating a Wind Energy Conversion System.

(H) **Public Conservation lands** shall mean land owned in fee title by State or Federal agencies and managed specifically for conservation purposes, including but not limited to State Wildlife Management Areas, State Parks, federal Wildlife Refuges and Waterfowl Production Areas. For purposes of this regulation, public conservation lands will also include lands owned in fee title by non-profit conservation organizations, Public conservation lands will also include private lands upon which conservation easements have been sold to public agencies or non-profit conservation organizations.

(I) **Rotor Diameter** shall mean the diameter of the circle described by the moving rotor blades.

(J) **Small Wind Energy Conversion System (SWECS)** shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-site consumption of utility power.

(K) **Substations** shall mean any electrical facility to convert electricity produced by wind turbines to a higher or lower voltage for interconnection with transmission lines.

(L) **Total Height** shall mean the highest point, above ground level, reached by a rotor tip or any other part of the Wind Energy Conversion System.

(M) **Tower** shall mean the vertical structures, including the foundation, that support the electrical generator, rotor blades, or meteorological equipment.

(N) **Tower Height** shall mean the total height of the Wind Energy Conversion System, between the ground level at the base of the tower and the top of the tower, exclusive of the rotor blades.

(O) **Transmission Line** shall mean the electrical power lines that carry voltages of at least 69,000 volts (69 KV) and are primarily used to carry electric energy over medium to long distances rather than directly interconnecting and supplying electric energy to retail customers.

(P) **Wind Energy Conversion System (WECS)** shall mean an electrical generating facility comprised of one or more wind turbines and accessory facilities, including but not limited to: power lines, transformers, substations and meteorological towers that operate by converting the kinetic energy of wind into electrical energy, which may be used on-site or distributed into the electrical grid.

(Q) **Wind Turbines** shall mean any piece of electrical generating equipment that converts the kinetic energy of blowing wind into electrical energy using airfoils or similar devices to capture the wind.

Small Wind Energy Conversion Systems

Purpose

It is the purpose of this regulation to promote the safe, effective and efficient use of wind energy systems installed to reduce the on-site consumption of utility supplied electricity.

Requirements

Small wind energy conversion systems shall be permitted as an Accessory Use within any district where the use is listed and allowed. Certain requirements as set forth below shall be met:

(A) Tower Height

(1) For all residential or residentially zoned properties tower height shall be limited to 80 feet or the maximum height for a structure in that district, tower must meet required setbacks.

(2) For non-residential or non-residentially zoned properties between 20,000 square feet and one acre tower height shall be limited to 80 feet or the maximum height for a structure in that district, tower must meet required setbacks.

(3) For non-residential or non-residentially zoned properties greater than one acre in size, there is no limitation on tower height, except that the tower must meet required setbacks.

(B) Minimum Lot Size

(1) Towers shall not be permitted on any lot of less than 20,000 square feet

(C) Setbacks

(1) No part of the wind system structure, including guy-wire anchors, may extend closer than 10 feet to the property lines of the installation site; tower must meet required underlying setbacks.

(D) Noise

(1) Small wind energy systems shall not exceed 60 dBA, as measured at the closet neighboring inhabited dwelling unit.

(2) The noise level may be exceeded during short term events such as utility outages and/or severe wind storms, wind speeds of greater than 50 miles per hour.

(E) Approved Wind Turbines

(1) Small wind turbines must have been approved under the Emerging Technologies program of the California Energy Commission or any other small certification program recognized by the American Wind Energy Association.

(F) Compliance with Building and Zoning Codes

(1) Applications for small wind energy systems shall be accomplished by standard drawings of the wind turbine structure, including the tower base, and footings.

(2) An engineering analysis of the tower showing compliance with official building code of the governing body and/or the State of Nebraska and certified by a licensed professional engineer shall also be submitted.

(G) Compliance with FAA Regulations

(1) Small wind energy conversion systems must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.

(2) No small wind energy system shall be installed until evidence has been given that the Central Nebraska Regional Airport has been informed of the applicant's intent to install a SWECS.

(H) Compliance with National Electrical Code

(1) Permit applications for small wind energy systems shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code and the National Electric Safety Code.

(I) Utility Notification

(1) No small wind energy system shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator.

(2) Off- grid systems shall be exempt from this requirement.

Setbacks

All towers for SWECS shall adhere to the setbacks established in the following table:

	Required Setbacks for SWECS Towers
Property Lines	One times the total height plus underlying setback
Road Rights-of-Way*	One times the total height plus underlying setback
Other Rights-of-Way	One times the total height plus underlying setback

* The setback shall be measured from any future Rights-of-Way if a planned change or expanded Right-of-Way is known

Commercial/Utility Grade Wind Energy Conversion Systems

Purpose

It is the purpose of this regulation to promote the safe, effective and efficient use of commercial/utility grade wind energy conversion systems within the City of Grand Island and its Extraterritorial Zoning Jurisdiction.

Requirements

Commercial/Utility Grade wind energy systems shall be a Conditional Use within the AG-2 Secondary Agricultural District, the TA Transitional Agriculture District and the AG-SI Special Agriculture/Industrial Zone. The following requirements and information shall be met and supplied:

(A) The name(s) of project applicant.

(B) The name of the project owner.

(C) The legal description and address of the project.

(D) A description of the project including: Number, type, name plate generating capacity, tower height, rotor diameter, and total height of all wind turbines and means of interconnecting with the electrical grid.

(E) Site layout, including the location of property lines, wind turbines, feeder lines, and all related accessory structures. This site layout shall include distances and be drawn to scale.

(F) Certification by an Engineer competent in disciplines of WEC's.

(G) Documentation of land ownership or legal control of the property.

(H) The latitude and longitude of individual wind turbines; included with this shall be an area or zone in close proximity that meets all setbacks; where actual WEC will be considered.

(I) A USGS topographical map, or map with similar data, of the property and surrounding area, including any other Wind Energy Conversion System, within 10 rotor distances of the proposed Wind Energy Conversion System not owned by the applicant.

(J) Location of migratory waterfowl flyways, wetlands, scenic, and natural areas within 1,320 feet of the proposed Wind Energy Conversion System.

(K) An Acoustical Analysis that certifies that the noise requirements within this regulation can be met

(L) The applicant shall supply the emergency management agency and/or fire departments with a basic emergency response plan.

(M) FAA and FCC permit, if necessary. Applicant shall submit permit or evidence that the permit has been filed with the appropriate agencies and that the Central Nebraska Regional Airport has been notified of the project.

(N) Evidence that there will be no inference with any commercial and/or public safety communication towers.

(O) Decommissioning Plan as required by this regulation.

Setbacks

All towers shall adhere to the setbacks established in the following table:

	Wind Turbine- Commercial/Utility WECS	Meteorological Towers
Property Lines	150 feet from property lines; however, the setback may be less when two adjoining property owners are within the aggregate project.	One times the tower height.
Neighboring Dwelling Units	1,000 feet	One times the tower height.
Road Rights-of-Way*	One-half the rotor diameter.	One times the tower height.
Other Rights-of-Way	NA	NA
Wildlife Management Areas and State Recreational Areas	600 feet	600 feet
Wetlands, USFW Types III, IV, and V	600 feet	600 feet
Other structures and cemeteries adjacent to the applicant's sites	One-half the rotor diameter.	One times the tower height.
Other existing WECS not owned by the applicant.	NA	NA

* The setback shall be measured from any future Rights-of-Way if a planned change or expanded Right-of-Way is known.

Special Safety and Design Standards

All towers shall adhere to the following safety and design standards:

(A) Clearance of rotor blades or airfoils must maintain a minimum of 12 feet of clearance between their lowest point and the ground.

(B) All Commercial/Utility WECS shall have a sign or signs posted on the tower, transformer and substation, warning of high voltage. Other signs shall be posted on the tower base or perimeter fencing with emergency contact information.

(C) All wind turbines, which are a part of a commercial/utility WECS, shall be installed with a tubular, monopole type tower.

(D) Consideration shall be given to painted aviation warnings on all towers less than 200 feet.

(E) Color and finish:

All wind turbines and towers that are part of a commercial/utility WECS shall be white, grey, or another non-obtrusive color. Blades may be black in order to facilitate deicing. Finishes shall be matte or non-reflective.

(F) Lighting:

Lighting, including lighting intensity and frequency of strobe, shall adhere to but not exceed requirements established by the FAA permits and regulations. Red strobe lights shall be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds. Red pulsating incandescent lights should be avoided.

(G) Other signage:

All other signage shall comply with the sign regulations found in the City Code.

(H) Feeder Lines:

All communications and connector lines associated with the project distribution system installed as part of a WECS shall be buried. Where obstacles to the buried lines create a need to go above ground, these lines may be placed above ground only to miss the obstacle.

(I) Waste Disposal:

Solid and Hazardous wastes, including but not limited to crates, packaging materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site promptly and disposed of in accordance with all applicable local, state and federal regulations.

(J) Discontinuation and Decommissioning:

A WECS shall be considered a discontinued use after one year without energy production, unless a plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the WECS to service. All WECS and accessory facilities shall be completely

removed to twelve feet below ground level within 180 days of the discontinuation of use. The 180 days may be extended if proof of weather delays is provided.

Each Commercial/Utility WECS shall have a Decommissioning plan outlining the anticipated means and cost of removing WECS at the end of their serviceable life or upon use being discontinued. The cost estimates shall be made by a competent party; such as a Professional Engineer, a contractor capable of decommissioning or a person with suitable expertise or experience with decommissioning. The plan shall also identify the financial resources that will be available to pay for decommissioning and removal of the WECS and accessory facilities. The initial plan shall be submitted with the application. An updated plan shall be filed with the City every 5 years.

(K) Noise:

No Commercial/Utility WECS shall exceed 50 dBA at the nearest structure or use occupied by humans.

(L) Interference:

The applicant shall not cause interference with power quality of area utility feeder circuits and shall not introduce noise to the connected electric distribution system. WECS shall not cause interference with any commercial or public safety electromagnetic communications, such as radio, telephone, microwaves, or television signals. The applicant shall notify all electric utilities and communication tower operators within five miles of the proposed WECS location upon application for permits.

(M) Environmental Permits:

The developer shall present evidence the project meets the environmental permitting requirements of all applicable state and federal agencies if such permits are required.

(N) Drainage System:

The applicant shall be responsible for immediate repair of damage to public drainage systems stemming from construction, operation or maintenance of the WECS.

Amended by Ordinance No. 9210, effective 04-08-2009