ARTICLE 10: RENEWABLE ENERGY

Section 10.01 Intent

It is the intent of this article to provide for the orderly development of renewable energy generation facilities in conformance with the *Thayer County Comprehensive Plan*, while ensuring adequate protection of public health, safety, and welfare.

10.01.02 Definitions

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

Abandon shall mean, for purposes of this section, failure to have a power purchase agreement in place for 90 days and decommissioning has not commenced, or a turbine has not been actively generating and selling power for 365 days. *See Section 10.03.09 and 10.04.06(5) following*.

Accessory Solar Energy Systems shall mean any photovoltaic, concentrated solar thermal, or solar hot water devices that are accessory to, and incorporated into the development of an authorized use of the property, and which are designed for the purpose of reducing or meeting on-site energy needs.

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.

ADLS Lighting System shall mean an Aircraft Detection Lighting System (ADLS) which provides reliable, continuous 360-degree radar surveillance of the airspace around sites and automatically activates obstruction lighting only when aircraft is detected within outer perimeter area.

Battery Energy Storage Systems (BESS) are devices that enable energy to be stored and then released when the power is needed, not including standard car batteries.

Bond, Collateral shall mean, for purposes of this section, an indemnity agreement for a fixed amount, payable to Thayer County, executed by the owner and supported by the deposit with Thayer County of cash, negotiable bonds of the United States (not treasury certificates), state or municipalities, negotiable certificates of deposit or an irrevocable letter of credit.

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

Commenced Commercial Operation shall mean, for purposes of this section, the signed date on the turbine completion certification for the turbine whose capacity first brings the wind generation facility's cumulative generating capacity to 100 kW or more.

Concentrated Solar Power shall mean a solar conversion system (SCS) that generates power by using mirrors or lenses to concentrate a large area of sunlight, or solar thermal energy, unto a small area. These include but are not limited to the following technologies: Parabolic trough, Solar power tower, enclosed trough, Fresnel reflectors and Dish Stirling.

Decommission/Decommissioning shall mean, for purposes of this section:

(a) the removal of aboveground wind turbine tower(s) after the end of a wind generation facility's useful life or abandonment;
(b) except as provided in rule, the removal of all buildings, cabling, electrical components, roads, or any other associated facilities; and
(c) except as provided in rule, reclamation of all surface lands to the previous grade and to comparable productivity in order to prevent adverse hydrological effects.

Electric Utility shall mean the public electric utility providing retail service to a given area.

Escrow, Cash shall mean a dedicated account of moneys delivered by the grantor, promisor, or obligor into the hands of the Thayer County Board of Commissioners, to be held by the latter until performance of a condition of these regulations and/or permit approval.

Expansion shall mean, for purposes of this section, the addition of one or more additional wind turbines, or larger size/capacity of wind turbines, to operation of a wind generation facility after approval of a permit by the Thayer County Board. Repowering is considered expansion when meeting these criteria.

Facility, WECS shall mean, for purposes of this section, any place, amenity, or piece of equipment provided for a particular purpose in support of wind energy development.

Fall Zone shall mean the area, defined as the furthest distance from the tower base, in which a tower will collapse in the event of a structural failure, as certified by a Professional Engineer.

Feeder Line shall mean any power line that carries electrical power from one or more wind turbines or individual transformers associated with individual wind turbines to the point of interconnection with the electric power grid, in the case of interconnection with the high voltage transmission systems the point of interconnection shall be the substation serving the wind energy conversion system.

Infrastructure, WECS shall mean, for purposes of this section, the physical structures, and facilities (e.g. buildings, roads, towers, power supplies, transformers, etc.) needed for the operation of the WECS enterprise.

Inhabitable Dwelling shall mean, for purposes of this section, a structure or part of a structure used as a home, residence, or sleeping place by a person maintaining a household or by two or more persons maintaining a common household, but does not include outbuildings, yard areas, or other land associated with the structure.

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.

Micro-Wind Energy Conversion System shall mean a wind energy conversion system (WECS) of 1 kW nameplate generating capacity or less and utilizing supporting towers of 40 feet or less.

Net Excess Generation shall mean, on an ISCS, the net amount of energy, if any, by which the output of a qualified facility exceeds a customer-generator's total electricity requirements during a billing period.

Net Metering shall mean a system of metering electricity in which a local distribution utility buys excess power from customer-generator facilities with a rated capacity at or below twenty-five kilowatts.

Owner, Project shall mean, for purposes of this section, a person(s) or entity who owns panels, turbines, towers, and/or other components of a solar or wind energy conversion system.

Non-participating Landowner shall mean an individual or group of individuals not involved in the overall project via land leases and other such means who may or may not be impacted by the Solar or WECS project.

Participating Landowner shall mean individual or group of individuals involved directly or indirectly in an overall project via land lese and or other such means.

Person shall mean, for purposes of this section, any individual, firm, partnership, company, association, corporation, city, town, or local governmental entity or any other state, federal, or private entity, whether organized for profit or not.

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 Natural Resource District (NRD) recreation areas, 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.

Repowering shall mean the combined activity of dismantling or refurbishing existing renewable energy facilities and commissioning new ones. Any change from approved permits shall require amended or new permits from Thayer County.

Rotor Diameter shall mean the diameter of the circle described by the moving rotor blades.

Shadow Flicker shall mean the visual strobe-like effect that occurs when the rotating blades of wind turbines cast repeating shadows.

Solar Access shall mean the ability to receive sunlight across real property for any solar energy device.

Solar Access Easement shall mean a right, expressed as an easement, covenant, condition, restriction or other property interest in any deed, will or other instrument executed by or on behalf of any landowner or in any order of taking, appropriate to protect the solar skyspace of a solar collector at a particularly described location to forbid or limit any or all of the following where detrimental to access to solar energy: structures on or above ground; vegetation on or above ground; or other activities. Such right shall specifically describe a solar skyspace in three-dimensional terms in which the activity, structures or vegetation are forbidden or limited or in which such an easement shall set performance criteria for adequate collections of solar energy at a particular location.

Solar Conversion System (SCS) shall mean an assembly, structure, or design, including passive elements, used for gathering, concentrating or absorbing direct or indirect solar energy, specifically designed for holding a substantial amount of useful thermal energy and to transfer that energy to a gas, solid or liquid or to use that energy directly; this may include, but is not limited to, a mechanism or process used for gathering solar energy through thermal gradients, or a component used to transfer thermal energy to a gas,solid or liquid or to convert into electricity.

Solar Conversion System, Commercial shall mean a commercial solar conversion system (CSCS) is a series of solar panels and equipment connected together in order to commercially supply the converted energy to a community and/or power grid. A CSCS shall have a one-way connection to the power grid.

Example of a Solar Conversion System, Ground-mounted

Solar Conversion System, Ground-Mounted shall mean any SCS which is directly supported and attached to the ground.

Solar Conversion System, Individual shall mean an individual solar conversion system (ISCS) shall be for the specific use of an individual residential, commercial, public or industrial use.

Solar Conversion System, Neighborhood shall mean a neighborhood solar conversion system (NSCS) is a series of solar panels and equipment connected together in order to supply converted energy to a specific neighborhood and its uses.

Example of a, Structure-mounted Solar System

Solar Skyspace shall mean the maximum three-dimensional space extending from a solar collector to all positions of the sun necessary for efficient use of the collector.

Where a solar energy system is used for heating purposes only, solar skyspace shall mean the maximum three-dimensional space extending from a solar energy collector to all positions of the sun between nine o'clock (9:00) A.M. and three o'clock (3:00) P.M. local apparent time from September 22 through March 22 of each year.

Where a solar energy system is used for cooling purposes only, solar skyspace shall mean the maximum three-dimensional space extending from a solar collector to all positions of the sun between eight o'clock (8:00) A.M. and four o'clock (4:00) P.M. local apparent time from March 23 through September 21 of each year.

Solar Oriented Subdivision shall mean a subdivision in which a minimum of 65 percent of the lots are solar-oriented lots.

Small Wind Energy System shall mean a wind energy conversion system (WECS) 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.

Standby Letter of Credit (SBLC) shall mean a guarantee made by a bank on behalf of a client, which ensures payment will be made even if their client cannot fulfil the payment; it is a payment of last resort from the bank, and ideally, is never meant to be used.

Structurally-mounted System shall mean an energy production system designed to be mounted on a building, including residential dwellings.

Substations shall mean any electrical facility to convert electricity produced by wind turbines to a voltage greater than 35,000 (35,000 kV) for interconnection with high voltage transmission lines.

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 (WECS).

Tower shall mean the vertical structures that support electrical, rotor blades, or meteorological equipment.

Tower Height shall mean the height above grade of the first fixed portion of a wind turbine tower.

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.

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. The energy may be used on-site or distributed into the electrical grid; also known as a "Wind Farm".

Wind Farm—See WECS.

Wind Generation Facility—See WECS.

Wind Turbine 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.

Section 10.02 Small Wind Energy Systems (WECS)

10.02.01 Purpose and Findings

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. Thayer County finds that wind energy is an abundant, renewable energy resource. The County, through this regulation, will permit small wind energy systems for individual "Net Metering" use.

10.02.02 Definitions See Section 10.01.02 above.

10.02.03 Requirements

Small wind energy 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:

1. Tower Height
   A. For property of ½ acre to one acre the tower height shall be limited to 80 feet.
   B. For property of one acre or more, there is no limitation on tower height, except as imposed by FAA regulations.
2. Noise
   A. Small wind energy systems shall not exceed 40 dBA, as measured at the closet neighboring inhabited dwelling unit.
   B. The noise level may be exceeded during short term events such as utility outages and/or severe wind storms.
3. Approved Wind Turbines
   A. Small wind turbines must have been approved under a small wind certification program recognized by the American Wind Energy Association (AWEA).

4. Compliance with Building and Zoning Codes
   A. Applications for small wind energy systems shall be accomplished by standard drawings of the wind turbine structure, including the tower base, and footings.
   B. An engineering analysis of the tower showing compliance with the official building code of the governing body and/or the State of Nebraska and certified by a licensed professional engineer shall also be submitted. The manufacturer frequently supplies this analysis. Wet stamps shall not be required.
5. Compliance with FAA Regulations
   A. Small wind energy systems must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.
6. Compliance with National Electrical Code
   A. 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. The manufacturer frequently supplies this analysis.
7. Utility Notification
   A. 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.
   B. Off-grid systems shall be exempt from this requirement.
8. Setbacks
   A. All towers shall adhere to the setbacks established in the following table (most restrictive shall apply):

	Wind Turbine – Small WECS
Property Lines	One times the total height
Distance between multiple units	One times the total height
Road Rights-of-Way	One times the tower height
Road Easements*	One times the tower height
Public conservation land	NA
Wetlands and Rivers as identified by the National Wetlands Inventory	NA

N/A – not applicable

Section 10.03 Commercial/Utility Scale Wind Energy Conversion Systems (WECS)

10.03.01 Purpose and Findings

In order to balance the need for clean, renewable energy resources with the protection of the health, safety, and welfare of the residents of Thayer County, Nebraska, the County finds these regulations are necessary in order to ensure that wind energy conversion systems (WECS) are appropriately designed, sited and installed. These regulations pertaining to all wind energy conversion systems are intended to respond to equipment available at the time of adoption. Thayer County recognizes that this is an emerging technology and that new means of collecting wind energy. including but not limited to vertical axis wind turbine generators are under development. Accordingly, these standards will be reviewed and may be amended as technology advances.

10.03.02 Definitions: *See Section 10.01.02 above.*

10.03.03 Application Requirements

Commercial/Utility Scale wind energy systems (WECS) shall be permitted as a conditional use within any district where the use is listed and allowed in **Section 5.06**. A Meteorological Tower may be approved separately from an aggregated Wind Farm application. The following requirements and information shall be met and supplied:

1. The name(s) and contact information of project applicant and project owner(s).
2. The legal description and address of the project.
3. Narrative: 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.
   A. Include the name of turbine manufacturers and models, and BESS specifications if any.
   B. Provide point of contact for general contractor (when selected)
4. Site layout plan(s):
   A. The site plan(s) shall be drawn so that North is to the top, and include:
      1) Legal description, including tax identification/parcel numbers,
      2) Location of property lines and setbacks,
      3) Location of wind turbine towers, indicating the location, height, and distance to nearest existing or proposed structures and property lines,
      4) Direction of prevailing winds,
      5) Electrical grid, including one-line diagram of the interconnection,
      6) Location of all underground structures including septic tanks and wells,
      7) Easements, right-of-way (names included), building locations, setback lines, and overhead utilities lines on project property,
      8) Proposed road access points,
      9) Related accessory structures including any proposed battery systems.
   B. The site plan shall show adjacent property and structures, noting existing structures, land use and zoning designations, to extent of required setbacks.
   C. The latitude and longitude of individual wind turbines shall be noted.
   D. Site layout shall be drawn to scale, stamped and sealed by a Professional Engineer or Licensed Surveyor authorized and certified to do business in Nebraska.
5. A USGS topographical map, or maps, showing:
   A. Any other WECS or turbines within 10 rotor diameters of the proposed WECS facility;
   B. Location of all known Communication Towers within two miles of the proposed WECS facility
   C. Location of water bodies, waterways, wetlands, historic sites, parks, and wildlife management areas within two miles of the proposed WECS facility.

6. Description of potential impacts on nearby WECS facilities and wind resources on adjacent properties.
7. Documentation required by **Section 10.03.07** below of:
   A. Land ownership and/or legal control of the property.
   B. Easement agreements.
   C. Copies of required federal permits and notifications
8. Acoustical and Infrasound Analysis certifying the noise requirements in this regulation can be met, conducted by an INCE -USA board certified Noise Control Engineer. authorized and certified to do business in Nebraska.
9. Shadow Flicker Analysis required by **Section 10.03.07(8)** below.
10. Professional Engineer's certification required by **Section 10.03.07(10)** below.
11. Road Reports required by **Section 10.03.08** below.
12. Decommissioning Plan including proposed financial guarantee, as required by **Section 10.03.09** below.
13. Requires Liability Insurance be carried for the life of the project.
14. Escrow Account for Compliance
    A. Applicant shall be required to fund an escrow account for investigation of complaints for but not limited to, shadow flicker, stray voltage, noise, and signal interference, with the amount of funds to be set at the discretion of the Thayer County Board of Commissioners.
    B. When the escrow account balance is below $5,000, Thayer County shall notify the Applicant. The Applicant shall replenish within 45 days of the notification.

10.03.04 Aggregated Projects

1. Aggregated projects may jointly submit a single Wind Farm application with multiple WECS and supporting equipment, and be reviewed under joint proceedings, including notices, public hearings, reviews, and as appropriate approvals.
2. Permits may be issued and recorded separately.
3. Joint projects will be assessed fees as one project.
4. The Zoning Administrator's substantive review may take at least 90 days before a public hearing is scheduled, to allow sufficient time for technical analysis and public process.

10.03.05 Performance Standards

All WECS facilities shall adhere to the following performance standards:

1. **Site Area:** Located on a lot or parcel of at least 10 acres in size.
2. **Noise:** No commercial/utility WECS shall exceed 40 dBA at the nearest inhabitable dwelling.
   A. Noise may exceed 40 dBA during periods of severe weather as designated by the US Weather Service.
3. **Height Requirement:** No Commercial WECS may exceed **650 ft above ground level** in total height.
4. **Monopole:** All wind turbines which are a part of a commercial/utility WECS shall be installed with a tubular, monopole type tower.
5. **Clearance:** Rotor blades or airfoils must maintain a minimum of 30 feet of clearance between their lowest point and the ground.
6. **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.
   A. Consideration shall be given to painted aviation warnings on all towers less than 200 feet.

7. **Lighting:** Lighting, including lighting intensity and frequency of strobe, shall adhere to but not exceed requirements established by the Federal Aviation Administration (FAA) permits and regulations.
   A. All CWECS projects, which require notice to the FAA via 14CFR, Part 77 obstruction evaluation process, will be required by Thayer County to submit to the FAA a request for Aircraft Detection Lighting System (ADLS) Marking and Lighting (M&L) Study.
      1) Upon completion of the M&L Study, the ADLS shall be installed, commissioned, and maintained to the extent allowed by the FAA. ADLS shall be operational within 12 months of the start of construction.
      2) If ADLS system is not operational within 12 months, as required by subsection 7.A(1) above, the Conditional Use Permit shall be considered immediately revoked, in accordance with procedures in Article 6 of this regulation. Any construction shall cease and a new CUP application will be required for the entire project.
   B. Lighting should be positioned or shielded to avoid visual impact to neighboring properties to the extent possible conforming to FAA rules. 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.
8. **Feeder Lines:** All electrical lines equal to or less than 34.5 kV in capacity installed as part of a WECS shall be buried at least six feet below finished grade, unless proven infeasible. Feeder lines installed as part of a WECS shall not be considered an essential service.
9. **Ownership notice:** The owner of record of any WECS shall notify the Thayer County Zoning Administrator of any subsequent change of ownership.

10.03.06 Setbacks

1. All towers shall adhere to the setbacks established in the following table (**the most restrictive shall apply**):

	Wind Turbine – Commercial/Utility WECS	Meteorological Towers
Participating Landowner Property Line	1.1 x total unit height	The greater of: The fall zone, as certified by a professional engineer, + 10 feet or a distance equal to total height.
Distance between multiple units	1.1 x total unit height	Monopoles: 750 feet Lattice/Guyed 1,500 feet
Distance to surveyed right-of-way	1.5 x total unit height from County Road*	The greater of: The fall zone, as certified by a professional engineer, + 10 feet or a distance equal to total height.
Distance to non-participating Landowner Property Line	1.0 mile & 40 dBA	
Distance to non-participating inhabitable dwelling	1.5 mile & 40 dBA **	
Distance to any participating inhabitable dwelling	1.1 x total unit height**	
Distance to any municipality	1.5 mile & 40 dBA from municipal limits	
Distance to any school, church, or cemetery	1.5 mile & 40 dBA	
Distance to any US/State Highway right-of-way	1.0 mile & 40 dBA	
Public conservation land	1.0 mile & 40 dBA	600 feet
Wetlands and Rivers as identified by the National Wetlands Inventory	1.0 mile & 40 dBA	

* ROW setback shall be measured from edge of the road easement for a County Road or the edge of a platted street, road, or highway.

** The setback for dwelling units shall be **reciprocal** in that no dwelling unit shall be constructed within the same distance required for a commercial/utility Wind Energy Conversion System.

2. **Impact Easements**. Recorded documents shall specifically identify the legal description of the subject property.
   A. A non-participating property owner may request to build closer than allowed in this section by signing and recording an Impact Easement from any operations within the required separation distance.
   B. A WECS owner may encroach on the required setback distance to non-participating property lines with a recorded Impact Easement signed by the affected property owner.

10.03.07 Safety and Design Standards and Additional Requirements

All WECS facilities shall adhere to the following safety and design standards:

1. **Signage:** 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 turbine with emergency contact information.
   A. All other signage shall comply with the sign regulations found in these regulations.
2. **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.
3. **Interference:** The Applicant shall minimize or mitigate interference with electromagnetic communications, such as radio, telephone, microwaves, or television signals caused by any WECS. The applicant shall notify all communication tower operators within five miles of the proposed WECS location upon application to Thayer County for a Conditional Use Permit.
4. **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.
5. **FAA:** Applicant shall provide copies of FAA notices of determination of no hazard to air navigation.
6. **FCC:** Applicant shall provide evidence appropriate FCC permits have been filed.
7. **Easements**: Easement agreements for transmission lines, feeder lines and substations required for the operation of the WECS, shall be in place prior to application for a permit.
   A. Easements shall be filed with the Thayer County Register of Deeds.
   B. Voluntary easements for the crossing of any form of neighboring properties shall be required and filed with the Application.
8. **Shadow Flicker:** Applicant shall conduct an analysis on potential shadow flicker at any occupied building with direct line- of-sight to the WECS.
   A. The analysis shall identify the locations of shadow flicker that may be caused by the project and expected durations of the flicker at these locations from sun-rise to sun- set over the course of a year.
   B. The analysis shall identify situations where shadow flicker may affect the occupants of the buildings for more than 30 hours per year and describe measures that shall be taken to eliminate or mitigate the problems.
   C. Shadow Flicker on an occupied building shall not exceed thirty (30) hours per year.
9. **Incident Plan:** Applicant shall prepare an Incident Response Plan which ensures their employees have the necessary equipment and training to effectively handle emergencies such as oil spills, turbine fires, turbine structural damage (or collapse) or equipment, including access to heavy equipment needed for rescue of trapped personnel.
   A. The Fire Chief, EMS Captain, County Sheriff, and County Emergency Management shall sign-off on the Incident Response Plan prior to beginning operations.
   B. Any and all changes to the Incident plan shall be reviewed by Fire, EMS, Law Enforcement, and Emergency Management.

10. **Engineer's Certification:** Certification shall be provided by a Professional Engineer registered in the State of Nebraska competent in disciplines of wind energy conversion systems and approved by Thayer County Planning Commission and Thayer County Board of Commissioners, including the following:
    A. Design specifications of the wind energy unit, including the tower, base, and footings, and unit components.
    B. For buildings or structurally-mounted units, the certified and sealed engineering plans prepared by a Professional Engineer registered in the State of Nebraska must show how the wind energy unit will be installed for the portions of the structure proposed for use in the mounting of the unit, and must state and show that the proposed wind energy unit is compatible with the portions of the mounting structure proposed for use, and does not impose a safety hazard to the main structure or adjacent property or their occupants.
    C. Drawings that indicate the total finished wind energy unit height from the grade level of each structure prior to any modifications and including any engineered break points on the tower.
    D. The wind survival speed of the entire unit, including the supporting structure, turbine, rotor blades, covers, and other components.
    E. Data pertaining to the tower or supporting structure's safety and stability, including any safety results from test facilities.

10.03.08 Roads and WECS projects

1. Each WECS tower shall apply for a unique 911 address.
    A. The 911 address shall be posted at the road entrance for each tower, and on or at each tower, no higher than fifteen feet above ground level.
2. Applicants shall prepare road reports and secure permits as follows:
    A. Identify haul routes for all municipal, township, or county roads to be used for the purpose of transporting WECS, substation parts, cement, and/or equipment for construction, operation, or maintenance of the WECS, and obtain applicable weight and size permits from the impacted jurisdictions prior to construction.
    B. Conduct a pre-construction survey, in coordination with the County Road Department, to determine existing road conditions.
        1) The survey shall include photographs and a written agreement to document the condition of the public facility.
        2) A cash escrow account shall be created to cover the total cost of repairing the road(s) and bridges to preconstruction conditions.
        3) The escrow amount will be maintained and kept available until all road(s) and bridge repairs are completed and all debts are paid in full.
    C. Be responsible for restoring or paying damages as agreed to by the applicable jurisdiction sufficient to restore the road(s) and bridges to preconstruction conditions.
    D. Applicant shall provide material safety data sheets (MSDS) to the Zoning Administrator pertaining to materials utilized on the project.

10.03.09 WECS Discontinuation and Decommissioning

1. A WECS shall be considered a discontinued use after one year without energy production, unless a continuation plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the WECS to service, including repowering.
    A. The Zoning Administrator may refer the continuation plan to the Planning Commission for consideration of revocation under **Section 6.10.02**.
    B. Repowering shall be considered regular maintenance, and no permit would be required, only when no tower or blade, or other equipment is extended. Turbines may be replaced with a higher-rating nameplate if the total height does not increase.

C. An amended permit is required when the height of any tower is changed, or when BESS or additional towers are added to the project.

2. 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 being discontinued use.
   A. The Decommissioning Plan shall include at minimum:
      1) The manner in which the facility will be decommissioned—the facility will be dismantled and no explosive will be used.
      2) A decommissioning schedule;
         a) All above-ground structures, including Meteorological Towers, shall be removed within one year of the discontinuation of use as defined.
      3) Detailed estimate of the cost of decommissioning a wind generation facility by a professional engineer licensed in the State of Nebraska, including:
         a) dismantling and removal of all towers, turbine generators, transformers, overhead cables and debris of the facility;
         b) removal of
            i. underground cables to a depth forty-eight (48) inches;
            ii. removal of foundations, buildings, and ancillary equipment to a minimum depth of forty-eight (48) inches below grade;
            iii. site restoration and reclamation to the approximate original topography that existed prior to the construction of the facility with grading, topsoil respread over the disturbed areas at a depth similar to that in existence prior to the disturbance, and reseeding at achieve the same utility of native vegetation of the surrounding area to prevent adverse hydrological effects,
            iv. Sections **10.03.09(2)A(3)b(i, ii, and iii)** immediately above may be waived by the Board with a signed request by the applicable landowner, identifying the underground cables; foundations, buildings, and ancillary equipment; and/or surface features the landowner prefers to remain in place explaining a valid reason the landowner prefers those features to remain.
         c) repairs and reconstruction from damage to public roads, culverts and natural drainage ways resulting directly from the decommissioning of a wind generation facility;
         d) the current salvageable value of the facility, as determined by an independent evaluator.
   B. All access roads shall be removed, cleared, and graded, unless a property owner agreement indicates otherwise, or the County through official action of the County Board agrees to keep the road.
   C. The cost estimates shall be made by a competent party as determined or approved by the Thayer County Commissioners.
      1) The plan shall also identify the financial resources available to pay for decommissioning and removal of the WECS and accessory facilities.
      2) Expenses related to the decommissioning shall be the responsibility of the WECS facility owner, including any expenses related to releasing any easements.
3. Applicant shall provide as-built plans including structural and electrical drawings of all facilities and all disturbances associated with the wind generation facility. The as-built plans must be certified by a professional engineer licensed in the State of Nebraska that the information included on depicted as-built plans is complete and accurate.
4. The Board, after hearing the Commission's recommendation, may reject a decommissioning plan if:
   A. it finds that the plan does not provide for decommissioning as defined in this section; and
   B. the plan does not adequately describe the cost of decommissioning.

5. Letter of Credit
   A decommissioning Standby Letter of Credit (SBLC) is required upon approval of a conditional use permit granted for the installation of Commercial WECS Facilities. All SBLC documentation is to be presented to the County Attorney and County Treasurer for review prior to approval of the CUP.
   A. Letter of Credit requirements.
      1) The SBLC is required prior to construction commencing.
      2) The SBLC must be issued or confirmed by a bank with AA or equivalent rating by one of the three major rating agencies (Fitch, Moody's, or S & P) in the United States of America.
      3) The SBLC shall be Irrevocable, Clean and contain an Evergreen clause (automatically renews annually).
      4) Eighteen months prior to the end of the power purchasing agreement, a professional engineer and/or decommissioning company shall evaluate the current decommissioning costs and the SBLC shall be no less than the current estimated costs.
      5) If a new power purchasing agreement is put in place, then the SBLC shall be reviewed and reset based upon the new agreement.
   B. Determination of Letter of Credit amount.
      1) The amount of the SBLC shall be determined by a professional engineer licensed in the State of Nebraska.
      2) The dollar amount metric shall include the current decommissioning costs compounded by the average inflation rate for similar decommissioning, reclamation work over the life of the power purchasing agreement.
   C. Penalties for Failure to Submit Letter of Credit
      1) If Applicant does not submit an acceptable SBLC to Thayer County within the timeframe required by this regulation, the CUP shall be revoked by the Board.
      2) The project owner shall submit a new application for approval prior to resuming operations.

Section 10.04 Solar Energy Uses

10.04.01 Purpose.

No solar panel, neighborhood solar, or solar farm shall be installed or constructed within the zoning jurisdiction of Thayer County, Nebraska, unless a zoning permit has been issued. All solar units shall be constructed in conformance with all state and national building and fire codes. For those devices that include electrical, plumbing and/or heating constructions, the applicable permits shall also be obtained. Solar panels shall meet the requirements found in this section.

10.04.02 Definitions *See Section 10.01.02 above.*

10.04.03 General Provisions Applying to ISCS, NSCS, and/or CSCS

The following provisions shall apply, typically, to two or more of the different solar conversion systems in this Section

1. **Agriculture:** Solar panels used to provide power to agricultural irrigation wells, potable drinking wells, and other agricultural uses (not residence, barns, sheds) shall be exempt from these regulations.
2. **For Commercial and Neighborhood SCS:** Applicant shall provide evidence that the project meets commonly accepted management practices for avian, wildlife, and environmental protections in place at the time of application.
3. **For Commercial and Neighborhood SCS:** Applicant shall comply with specific requirements of the local fire department.
4. **Maintenance:**
   All system and components shall be kept in operational condition, including appearance of all components; plus, the ground beneath the SCS shall be kept in a presentable manner based upon the ground cover decided.
5. **Decommissioning:**
   All systems when they are no longer generating power and will no longer be used shall follow a decommissioning plan agreed to upfront by the Thayer County Board, the electric utility, and the owner/developer.
6. **Repowering:**
   If any operation of an SCS is suspended for purposes of repowering, replacement, or maintenance, decommissioning provisions will not apply for up to six months. However, an SCS that is not operating or is operating at a substantially reduced capacity for more than one year will be considered abandoned and Decommissioning provisions will apply.
   A. Repowering does not require a new or amended permit if the footprint of the SCS is the same or reduced. Any increase in the footprint or height of structures at the facility will require permit amendment.
7. **Other Requirements:**
   A. Any applicant for a SCS project shall demonstrate they have met the requirements of the electric utility and have in place an interconnection agreement with the electric utility.
   B. Details shall be included of any proposed Battery Energy Storage Systems (BESS).
   C. All NSCS and CSCS operations shall have located at key access points signage stating specific language as outlined by the electric utility.
   D. SCS may be installed in the floodway fringe subject to floodplain regulations, as may be amended from time to time, given that all components are installed a minimum of two feet (2') above base flood elevation and subject to written authorization of the Floodplain Administrator.
      1) No SCS shall be constructed in the identified Floodway.
   E. Maintenance of all leased ground, including control of noxious weeds.
8. **Concentrated Solar Power (CSP) systems** are prohibited within Thayer County's jurisdiction.

9. **Decommissioning Plan:** Financial assurances shall be in place as part of a Decommissioning Plan.

10.04.04 Individual Solar Conversion Systems (ISCS)

1. **General Requirements for ISCS:**
   ISCS's shall conform to the required front, side, and rear lot setback requirements except as provided herein:
   A. The applicant for any ISCS shall provide evidence that they have a valid Net Metering agreement with the electric utility.
   B. An ISCS which is attached to an integral part of the principal building shall meet all local, state, and federal codes for building, electrical, plumbing, and accessibility.
   C. A ground-mounted ISCS may be located only in the required rear yard provided it does not exceed 12-feet in height and is located not less than five feet from the rear lot line and not closer than one foot to any existing easement as measured from the closest point of the structure including its foundation and anchorage.
   D. Setbacks: No ground mounted ISCS shall be located in the required side yard or front yard.
   E. All ISCS's shall have an agreed solar access easement, on the south side of the yard, from any neighboring properties. Said easement shall be filed as an instrument to each property's deed and said easement shall stay in place as long as the ground mounted SCS is in place and operational.
2. **Structural Requirements:**
   The physical structure and connections to existing structures shall conform to the applicable local, state, and federal codes.
3. **Site Plan:**
   The application for a zoning permit shall be accompanied by a site plan drawn to scale showing property lines, existing structures on the lot, proposed solar panel location with respect to property lines, and dimensions of the proposed solar panel.
4. **Preexisting Solar Panels:**
   Notwithstanding noncompliance with the requirements of this section, a solar panel erected prior to the adoption of these Regulations, pursuant to a valid permit issued by Thayer County, may continue to be utilized so long as it is maintained in operational condition.
5. **Decommissioning**
   A. Whenever an SCS ceases operation on a property, the property owner shall be required to report this to the County and the electric utility.
   B. Whenever, a ground mounted SCS is no longer operating, the property owner shall have six months to completely remove the structure and wiring. The location of the SCS shall be returned to a usable state based upon the surrounding property.

10.04.05 Neighborhood Solar Conversion Systems (NSCS)

1. General Requirements for NSCS:

A. NSCS's shall meet the following requirements as provided herein:

1) An NSCS shall be set on its own lot within the neighborhood/development and shall meet underlying setbacks for principal structures.
2) The NSCS shall be designed and constructed for no more than the anticipated maximum solar usage in the designated neighborhood or development.
3) No excess power generated shall be sold or given to a user outside the agreed upon neighborhood or development, except via a Net Metering agreement.
4) The developer shall provide the County with all solar easements established; however, the County shall not be responsible for enforcing said easements.
5) All solar easements shall be enforced by an established Homeowners Association for the development/neighborhood.
6) A ground mounted NSCS shall be protected with fencing and/or bollards.
7) All connections to the uses within the neighborhood shall be made underground.
8) An access agreement between the developer, Homeowners Association, and any other necessary other entity and the electric utility shall exist in case of an emergency.
9) A Net Metering agreement between the developer, Homeowners Association, and any other entity and the electric utility shall exist in case of excess electricity; and
10) All ground mounted NSCS's shall have an agreed solar access easement from any neighboring properties. Said easement shall be filed as an instrument to each property's deed and said easement shall stay in place as long as the ground- mounted NSCS is in place and operational.

2. Structural Requirements:

The physical structure and connections to existing structures shall conform to the applicable local, state, and federal codes.

3. Solar Oriented Subdivision/Site Plan:

A. Whenever a NSCS is part of a proposed new subdivision, the developer shall outline the specific lot or outlot where the NSCS will be placed.

1) Specific developments/neighborhoods initially designed with an NSCS shall identify all solar easements on the preliminary and final plats and shall be recorded the same as other utility easements. In addition, the subdivision plats shall indicate, in addition to all other requirements in the subdivision regulations, the location of all proposed underground conduits serving the other lots in said subdivision.

B. The application for a permit shall be accompanied by a site plan drawn to scale showing property lines, existing structures on the lot, proposed solar panel location with respect to property lines, and dimensions of the proposed solar panel.

C. The developer shall install all underground wiring as prescribed by the electric utility.

D. All underground wiring shall be protected by a utility easement or located within prescribed rights-of-way.

E. The developer shall provide the County Zoning Administrator with as-builts including wiring locations.

4. Decommissioning

A. A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. Decommissioning of a NSCS must occur in the event they are not in use for 12 consecutive months, as outlined in **Section 10.04.07 below**.

10.04.06 Commercial Solar Conversion Systems (CSCS):

1. Applicability

The purpose of this subsection is to provide standards tor fixed-panel photovoltaic solar farms or CSCS consisting of ground-mounted solar panels capturing energy from the sun and converting it to electricity. The provisions of this section are based on a ground-mounted photovoltaic facility using a rammed post construction technique and panels supporting the flow of rainwater between each module and the growth of vegetation beneath the arrays and limiting the impacts of stormwater runoff. The rammed post construction technique allows for minimal disturbance to the existing ground and grading of the site. Based on the assumed solar farm design, The County finds the use to be low intensity with minimal trip generation, low amounts of impervious cover, and low emission thus the use is compatible in urbanized, non- urbanized, or low-density areas with other uses.

2. Site Development Standards:

A. Lot coverage: Requirements of the underlying zoning shall apply to solar panels and structures.

B. Setbacks: A twenty-five (25) foot setback shall be provided from all property lines or road/access easements.

1) A fifty-foot (50') setback shall apply measured from a lot line that abuts a residential zoning district.
2) Power inverters or other sound-producing equipment (producing in excess of 40 dBA) shall be set back a minimum of one hundred fifty (150) feet from all property lines.

C. Height: Solar panel arrays shall not exceed **20 feet** in height; otherwise, height requirements of the district shall apply.

D. Landscaping Buffer: The primary use of the property shall determine the buffer requirement. Where a ground-mounted photovoltaic solar farm is the primary use the property shall be considered industrial or agricultural for the purposes of buffer requirements, there are no requirements for screening from public streets.

E. Stormwater Management: Fixed panel solar arrays shall be considered pervious and the property shall be designed to absorb or detain specific runoff. The impervious cover calculation shall include the support posts of the panels, any roads or impervious driveway surfaces, parking areas and buildings on the site.

F. Fencing: Due the unique security requirements of this land use, and to facilitate the educational value of seeing this land use, fencing up to eight feet in height is permitted provided the fencing material is predominantly open.

G. Incident Plan: Applicant shall prepare an Incident Response Plan which ensures their employees have the necessary equipment and training to effectively handle emergencies such as equipment fires, structural damage (or collapse), and materials spills, including access to heavy equipment needed for rescue of trapped personnel.

A) The Fire Chief, EMS Captain, and County Sheriff shall sign-off on the Incident Response Plan prior to beginning operations.

H. Signage: Signs shall conform to the County Sign Regulations.

I. Power Lines: Customer-owned on-site power lines shall be buried except where connecting to existing overhead utility lines. This requirement shall not apply to fiber optic connections.

J. Other Codes: All State and Federal codes and provisions not specified in this subsection are required including but not limited to tree preservation, traffic impact analysis, and historic preservation.

3. Submittal Requirements:

All Plans shall contain the following:

A. A site plan, drawn to scale, of the property indicating the total site acreage, landscape and buffer areas, tree preservation, location of all structures, the proposed location of the solar panels, the distances of the solar panels to structures on the property as well as distances to the property lines.

B. The site plan shall include roads, electric lines, and/ or overhead utility lines.

C. A description of the electrical generating capacity and means of interconnecting with the electrical grid as coordinated and pre-approved with the appurtenant Power District.

D. A copy of the interconnection agreement with the local electric utility.

E. Drawings or blueprints of solar panels and arrays in conjunction with the application for a building permit for a solar farm/solar power plant.

F. Structural engineering analysis for a solar panel, array and its foundation, as applicable.

G. Manufacturer's recommended installations, if any.

H. Documentation of land ownership and/or legal authority to construct on the property.

I. Decomissioning plan.

4. Compliance with Other Regulations:

A. Zoning permit applications for CSCS's shall be accompanied by a line drawing of electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the State's adopted electrical code and that has been pre- approved by the associated power district meeting their Distribution Generation Requirements and Guidelines; and

B. This subsection does not waive any requirements of any state or Federal codes, electrical codes or other technical codes as applicable.

5. Discontinuation:

A. A CSCS shall be considered abandoned after one year without energy production. The solar equipment owner shall remove all SCS equipment and appurtenances within one year of abandonment, as outlined in **Section 10.04.07 below.**

10.04.07 Solar Facility Decommissioning Plan

1. A **NSCS or CSCS** shall be considered a discontinued use after one year without energy production, unless a continuation plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the facility to service.

   A. The Zoning Administrator may refer the continuation plan to the Planning Commission for consideration of revocation under **Section 6.10.02**.

   B. An amended permit is required when the footprint of solar panels is expanded, or when BESS is added to the project.

2. Each **NSCS or CSCS** shall have a Decommissioning Plan outlining the anticipated means and cost of removing the facility at the end of their serviceable life or upon being discontinued use.
   A. The Decommissioning Plan shall include at minimum:
      1) The manner in which the facility will be decommissioned.
      2) A decommissioning schedule;
         a) All above-ground structures shall be removed within one year of the discontinuation of use as defined.
      3) Detailed estimate of the cost of decommissioning a solar facility by a professional engineer licensed in the State of Nebraska, including:
         a) dismantling and removal of all solar panels, support structures, transformers, overhead cables and debris of the facility;
         b) removal of
            i. underground cables to a depth forty-eight (48) inches;
            ii. removal of foundations, buildings, and ancillary equipment to a minimum depth of forty-eight (48) inches below grade;
            iii. site restoration and reclamation to the approximate original topography that existed prior to the construction of the facility with grading, topsoil respread over the disturbed areas at a depth similar to that in existence prior to the disturbance, and reseeding to achieve the same utility of native vegetation of the surrounding area to prevent adverse hydrological effects,
            iv. Sections **10.04.07(2)A(3)b(i, ii, and iii)** immediately above may be waived by the Board with a signed request by the applicable landowner, identifying the underground cables; foundations, buildings, and ancillary equipment; and/or surface features the landowner prefers to remain in place explaining a valid reason the landowner prefers those features to remain.
         c) repairs and reconstruction from damage to public roads, culverts and natural drainage ways resulting directly from the decommissioning of a solar generation facility;
         d) the current salvageable value of the facility, as determined by an independent evaluator.
   B. All access roads shall be removed, cleared, and graded, unless a property owner agreement indicates otherwise, or the County through official action of the County Board agrees to keep the road.
   C. The cost estimates shall be made by a competent party as determined or approved by the Thayer County Commissioners.
      1) The plan shall also identify the financial resources available to pay for decommissioning and removal of the NSCS or CSCS and accessory facilities.
      2) Expenses related to the decommissioning shall be the responsibility of the facility owner, including any expenses related to releasing any easements.
3. Applicant shall provide as-built plans including structural and electrical drawings of all facilities and all disturbances associated with the solar generation facility. The as-built plans must be certified by a professional engineer licensed in the State of Nebraska that the information included on depicted as-built plans is complete and accurate.
4. The Board, after hearing the Commission's recommendation, may reject a decommissioning plan if:
   A. it finds that the plan does not provide for decommissioning as defined in this section; and
   B. the plan does not adequately describe the cost of decommissioning.

5. Letter of Credit
   A decommissioning Standby Letter of Credit (SBLC) is required upon approval of a conditional use permit granted for the installation of NSCS or CSCS facilities. All SBLC documentation is to be presented to the County Attorney and County Treasurer for review prior to approval of the CUP.
   A. Letter of Credit requirements.
      1) The SBLC is required prior to construction commencing.
      2) The SBLC must be issued or confirmed by a bank with AA or equivalent rating by one of the three major rating agencies (Fitch, Moody's, or S & P) in the United States of America.
      3) The SBLC shall be Irrevocable, Clean and contain an Evergreen clause (automatically renews annually).
      4) Eighteen months prior to the end of the power purchasing agreement, a professional engineer and/or decommissioning company shall evaluate the current decommissioning costs and the SBLC shall be no less than the current estimated costs.
      5) If a new power purchasing agreement is put in place, then the SBLC shall be reviewed and reset based upon the new agreement.
   B. Determination of Letter of Credit amount.
      1) The amount of the SBLC shall be determined by a professional engineer licensed in the State of Nebraska.
      2) The dollar amount metric shall include the current decommissioning costs compounded by the average inflation rate for similar decommissioning, reclamation work over the life of the power purchasing agreement.
   C. Penalties for Failure to Submit Letter of Credit
      1) If Applicant does not submit an acceptable SBLC to Thayer County within the timeframe required by this regulation, the CUP shall be revoked by the Board.
      2) The project owner shall submit a new application for approval prior to resuming operations.