



City of Lawrence  
Douglas County  
PLANNING & DEVELOPMENT SERVICES



# WIND ENERGY CONVERSION SYSTEMS (WECS) TA-22-00032

*December 19, 2022  
Planning Commission*



# History & Existing Regulations



TA Initiated by Planning Commission on January 24, 2022  
– Revision to existing Section 12-306-44 *Conditional Use*

Original adoption in April 2017 (TA-15-00571)

**Since the adoption of Section 12-306-44 there have been no proposals for a commercial-scale wind farm in the Unincorporated Territory of Douglas County.**

[www.lawrenceks.org/windregs](http://www.lawrenceks.org/windregs)



# Permitted Land Use



## Douglas County Zoning and Land Use Regulations

### Section 12-304-3: Permitted Use Table

WECS



	AG-1	AG-2	CP	LS	LB	RT	GB	LI	GI	V	BSC	USE STDS
<b>A = Accessory use</b> <b>P = Permitted use</b> <b>C = Requires Conditional Use Permit</b> <b>PG=Parking Group</b> <b>*=Specific Use Standards</b>												
Mining, Excavation and/or Extraction of Natural Resources	C*	C*	-	-	C*	C*	C*	C*	C*	-	C*	306-27 PG 4
Salvage Yards	-	-	-	-	-	-	-	-	C*	-	-	306-37 PG 14
Wholesale Storage & Distribution/ Warehousing	-	-	-	-	-	-	P*	P	P	-	P	306-43 PG 4
Research Facility, Ag Related	P/C	P/C	-	-	-	-	P	P	P	-	P	PG 4
<b>Medical</b>												
Medical or Dental Clinics or Offices	-	-	-	-	-	-	P	-	-	C	P	PG 7
Extended Care Facility	-	-	-	-	-	-	C*	-	-	C*	C*	306-29 PG 16
<b>Utilities</b>												
Major Utilities	C	C	C	-	-	-	-	P	P	C	-	PG 4
Minor Utilities	P	P	P	P	P	P	P	P	P	P	P	PG 14
Wind Turbine/Residential or Accessory	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	
Wind Energy Conversion System/ Commercial	C*	-	-	-	-	-	C*	C*	C*	-	C*	306-44 PG 14
<b>Communications</b>												
Amateur and Receive Only Antennas	P	P	P	-	P	P	P	P	P	P	P	
Radio, Television, and Microwave Towers	C*	C*	C*	-	C*	C*	C*	C*	C*	C*	C*	306-31 PG 14



# Language: Meaning and Usage



## Section 12-301-4: General Rules of Interpretation

### Meaning

The language of the Zoning Regulations shall be read literally. Regulations are no more or less strict than stated. Words used in the Zoning Regulations have the standard dictionary definition unless they are defined in Section 12-315.

### Usage

- Words in the present tense include the future tense and the reverse is true.
- Words **shall**, **will**, **shall not**, and **may not** are mandatory.
- The words **may** and **should** are permissive.
- When used with numbers, 'up to x', 'not more than x', and 'a maximum of x', all include x.



# Quick Definition



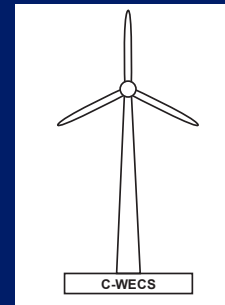
## WECS

A *Wind Energy Conversion System* is a system of wind-driven generators that convert wind energy into electrical power.

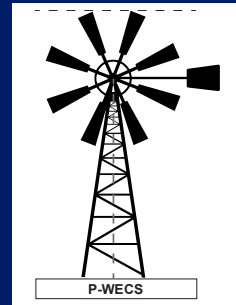
Individual machines are also referred to as a turbine, wind tower, windmill, or wind pump.

A WECS may be for personal or commercial use, these two varying uses are referred to as P-WECS and C-WECS, respectively.

**WECS =**



**or**





# Existing Regulations Section 12-306-44



- 12-306-44.01 Definitions (Five total, including P-WECS regulations)
- 12-306-44.02 Large Wind Energy Conversion System (1 mile notice)
- 12-306-44.03 Conditions Required for Approval (Key Considerations & Application)
- 12-306-44.04 Development/Site Plan Requirements
- 12-306-44.05 Design Standards (Setback = 110% height)
- 12-306-44.06 Decommissioning/Restoration/Abandonment Plan
- 12-306-44.07 Bond Agreement



# Revised Regulations



12-306-44.01 Definitions (Twenty-four definitions)

12-306-44.02 Personal - Wind Energy Conversion System (P-WECS)

12-306-44.03 Commercial - Wind Energy Conversion System (C-WECS)

12-306-44.03.01 Key Considerations

12-306-44.03.02 Contents of Application (Clarified for both applicants and staff)

12-306-44.03.03 Design Standard (Siting requirements)

12-306-44.03.04 Performance Standards (Continued compliance requirements)

12-306-44.03.05 Building Permit Issuance

12-306-44.03.06 Revisions to Approved Plan

12-306-44.03.07 Abandonment, Decommissioning and Reclamation Plan



# Review Criteria for Text Amendments



- Does the proposed text amendment correct an error or inconsistency in the Zoning Regulations or meet the challenge of an existing condition?
- Does the proposed text amendment advance a clear public purpose?
- Does the proposed amendment affect the adequacy of existing or planned facilities and services?
- Does the proposed text amendment result in reasonably compatible land use relationships?
- Will the proposed text amendment advance the interests of rural Douglas County as a whole, not solely those having immediate interest in the affected area?
- Is the proposed text amendment consistent with the Comprehensive Plan and the stated purpose of the Douglas County Zoning Regulations?





# Review Criteria Findings Summary



- ✔ Improves alignment with other regulations of Douglas County Zoning.
- ✔ create a more comprehensive and clear application process and establish performance measures.
- ✔ Creates measures for protecting public infrastructure during construction.
- ✔ Creates documentation requirements and detailed performance measures, increases notice boundaries, increases structure setbacks, and caps maximum height.
- ✔ Creates clear processes for both review of an application and assessment of performance.
- ✔ More clearly aligns development requests with protection standards for natural resources.



# Definitions



Proposed definitions section significantly expands and clarifies text when compared to existing regulations.

New Definitions include:

- Distinction between Participating Landowners and Non-Participating;
- Concepts specifically applicable to WECS such as Shadow Flicker and Blade Glint;
- Measurable components (Hub Height, Rotor, etc.);
- Defining Governing Body and Qualified Professional as a means to clarify who is responsible for making decisions and assessing studies



# Review and Approval Process



## P-WECS; Personal - Wind Energy Conversion System



- Reviewed within a building permit similar to an accessory structure. Subject to County adopted building codes.
- Must meet the Conditions of approval listed within 12-306-44.02 e.g., maximum height, setbacks, power rating, etc.
- May not be converted into a commercial-scale wind farm without going through the C-WECS CUP process.



## C-WECS; Commercial - Wind Energy Conversion System

- Reviewed through a modified Conditional Use Permit application. The CUP would be issued for the entire Wind Farm project area.
- Requirements of the CUP will include (but are not limited to) specific siting standards, extensive studies regarding visual, noise, infrastructure, and environmental impacts, and a formally executed Decommissioning and Reclamation plan.



## Personal - Wind Energy Conversion System (P-WECS)



- Cumulative maximum power rating of 50 kilowatts of electrical power on site.
- Total height shall not exceed 75 feet.
- Setback from the nearest property line: Total height of the P-WECS, measured from the center of the tower.
- Setback from roadways: dimensional standards of the zoning district.
- Subject to appropriate building permits and site plan requirements.
- P-WECS sited on industrially-zoned or business-zoned properties are subject to site plan requirements.
- A small, personal-use wind energy conversion system shall be subject to Chapter 13 of the Douglas County Code for original approval, periodic review, and standards associated with an accessory structure.



# Commercial - Wind Energy Conversion System (C-WECS)



Aligned purpose and intent of C-WECS with organizational structure of Solar Energy Conversion Systems regulations. Along with the following subsections.

12-306-44.03.01 Key Considerations

12-306-44.03.02 Contents of Application

12-306-44.03.03 Design Standard

12-306-44.03.04 Performance Standards

12-306-44.03.05 Building Permit Issuance

12-306-44.03.06 Revisions to Approved Plan

12-306-44.03.07 Abandonment, Decommissioning and Reclamation Plan



# C-WECS Key Considerations



This section highlights key issues which shall be considered in addition to the review and decision-making criteria listed in the following sections.

It follows the structure of the recently adopted Solar Regulations and places burden of proof on applicant to demonstrate the project can conform to the purpose and intent of the code.

- Siting Considerations;
- Visual Impact;
- Noise Impact;
- Environmental Impact;
- Infrastructure Impact;
- FAA Impact;
- Building Safety and Construction Management;
- Extraordinary Event Response;
- Operation and Maintenance;
- Decommissioning and Reclamation.



# C-WECS Application



No action on the request will be taken until all of the required information has been submitted. Applications seeking approval of a C-WECS Project shall include, at a minimum, the following:

- A Concept Plan
- A Lighting Plan
- Visual Impact Assessment
- Noise Impact Assessment
- Environmental Impact Assessment
- Stormwater Management Plan
- Traffic Study and Road Maintenance Agreement
- Operation and Maintenance Assessment
- FAA Requirement Acknowledgement
- Emergency Mitigation Plan
- Decommissioning Plan
- Costs / Fees
- Public Notice (extraordinary 2-mile notice)
- Provisions



# C-WECS Design Standards



This is a new section to the regulations based on best practices following the Key Considerations and requiring the turbines be sited in an appropriate manner.

Standards include but are not limited to:

- Setback Requirements
- Permitted Height
- Minimum Clearance
- Structural Design & Color
- Internal only wireless co-location
- Safety Protocols & Fire Suppression
- Prohibited Markings
- Access Road Requirements
- Visual Uniformity





# C-WECS Setback



## Staff Proposed Setbacks

- **1,500 feet** to the participating landowner's residence and any other occupied structures.
- **1,500 feet** from the property line of non-participating property owners.
- **110%** of the total height of the turbine from public roads and rights-of-way.

Additional or reduced setback requirements may be imposed by Board of County Commissioners as conditions of approval to the project

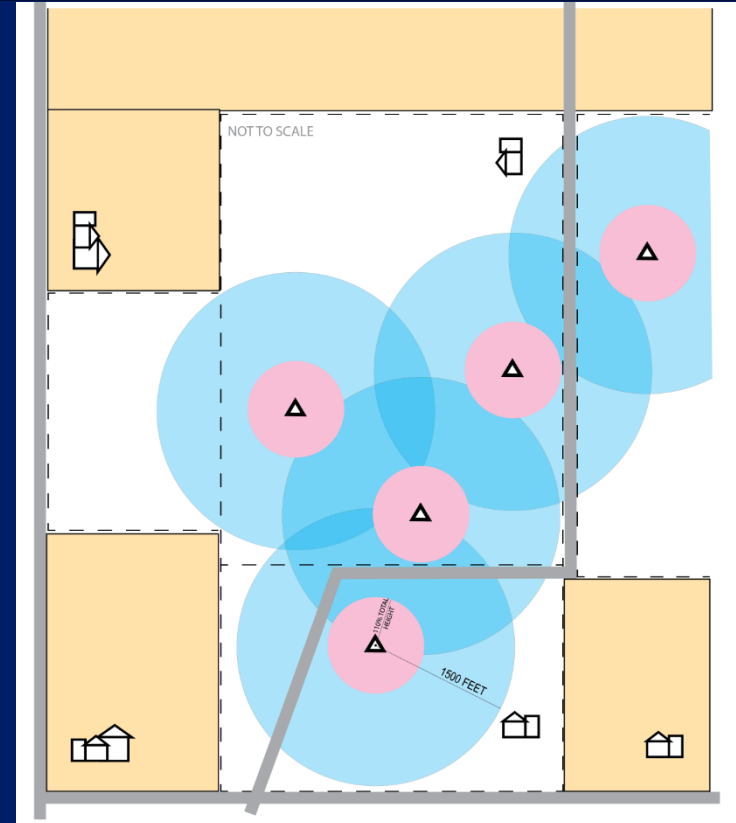
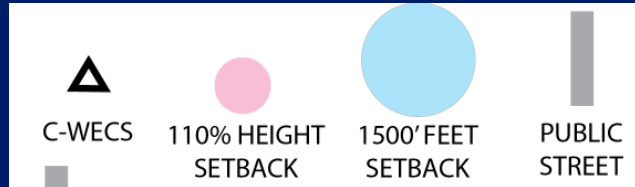


# C-WECS Setback



Example of how setbacks would apply on a site:

Not to scale + Not a real property example





# C-WECS Height

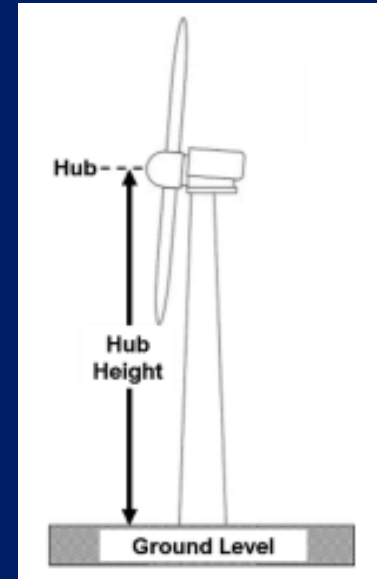


## Staff Proposed Permitted Height

Permitted height shall be determined by the hub height for each individual turbine. The maximum hub height shall be **80 meters**, as measured by manufacturer specifications.

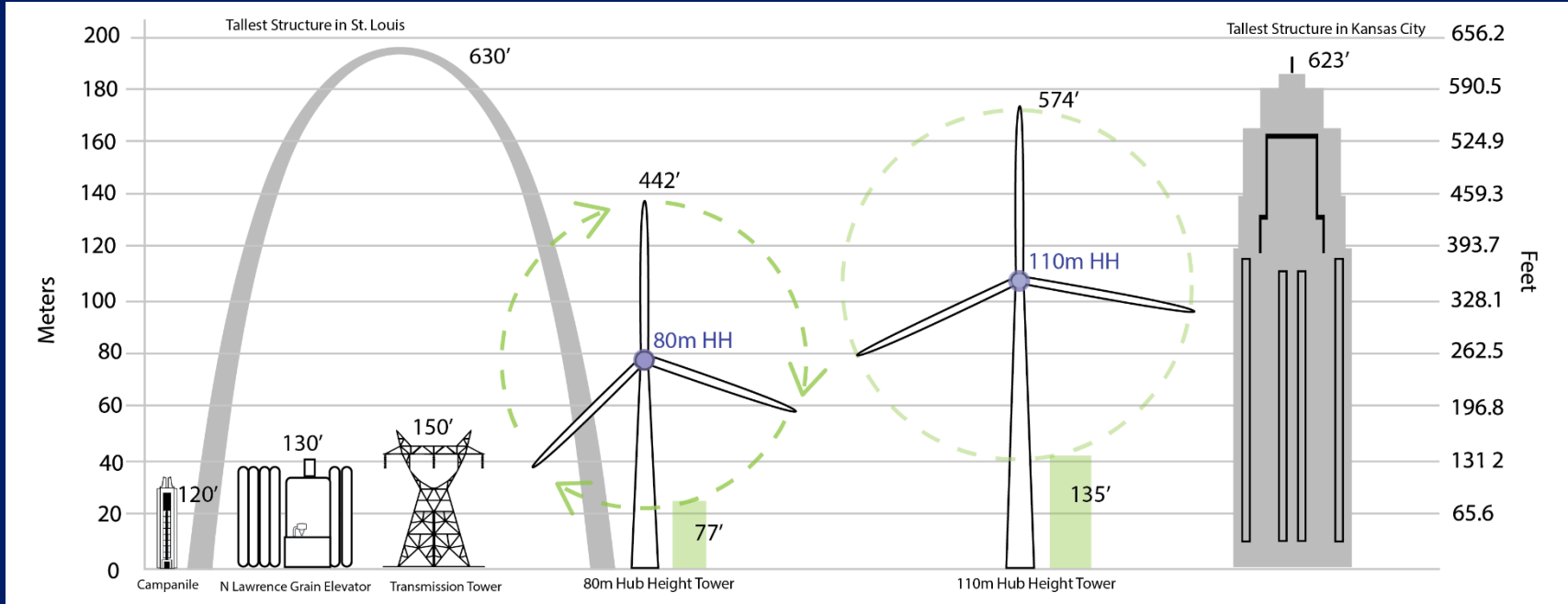
The Board of County Commissioners may approve greater height for individual turbines, but not greater than **110 meters** hub heights, if increased tower height better aligns with the purpose and intent of this section.

Staff's recommendation is based on an effort to balance maintaining the character of Douglas County, reviewing nearby existing turbines, and industry standards and available equipment.





# C-WECS Height



HH = Hub Height, The distance measured from the ground immediately adjacent to the tower foundation to the center of the rotor hub.

Clearance height



# C-WECS Standards



The difference between **Design Standards** and **Performance Standards** is that design standards are more-so applicable during the siting phase. Performance standards are applicable throughout the life of the project and must be in continued compliance.

Failure to comply with Performance Standards may be grounds for suspension, amendment, or revocation of CUP as determined by the Board of County Commissioners.



# C-WECS Performance Standards



This section serves to evaluate the as-built wind farm with what was presented within the application & maintain continued compliance with the standards in this section. It also serves to provide a means of mitigation should any issues arise with the C-WECS project once in operation.

Standards include but are not limited to:

- Siting Considerations
- Visual Impact
  - Shadow Flicker
  - Lighting
  - Blade Glint
- Noise Impact
  - Construction Noise
  - Operational Noise
- Environmental Impact
  - Wildlife & wildlife habitat
  - Water quality & soil erosion
- Infrastructure Impact
- FAA Compliance
- Extraordinary Event Response
- Maintenance
- Decommissioning and Reclamation



# C-WECS Noise



## Staff Proposed Noise Standards

Construction: During construction phase of C-WECS development, construction activities of any nature may only occur from one hour after sunrise until one hour before sunset.

Operation: Noise level shall not exceed **50 decibels** measured at the property line of the nearest non-participating property owners. Noise caused by operating turbines shall not cause adverse low-frequency sounds which disrupt non-participating property owners.

A good faith effort shall be made by the C-WECS Operator to mitigate any unforeseen issues caused by demonstrable noise impacts.



# C-WECS Noise



Perception of volume is always subjective and depends on one's own hearing but generally speaking, an increase of 10 dB roughly corresponds to the perceived volume doubling in intensity.

For example, 60 dB is perceived as twice as loud as 50 dB.

## How loud is a... ?



**Whisper**  
30 dB



**Refridgerator**  
40 dB



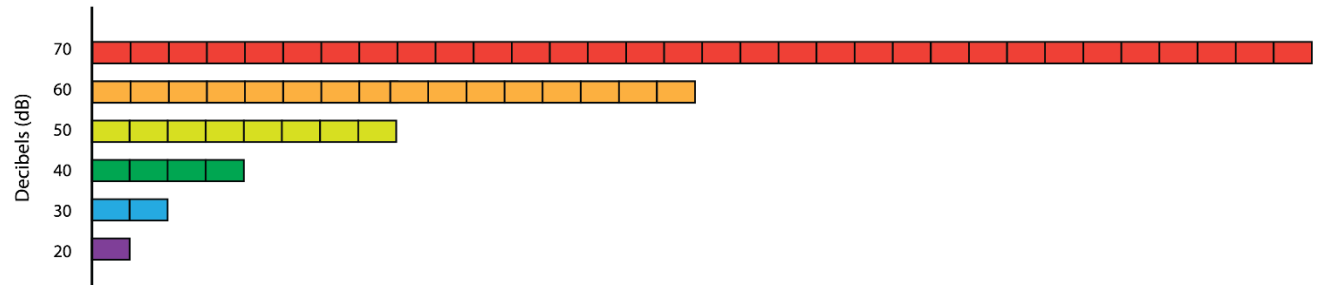
**Dishwasher**  
50 dB



**AC Unit**  
60 dB



**Vacuum**  
70 dB







# C-WECS Lighting



## Staff Proposed Lighting Standards

All turbines and accessory facilities shall be sited to minimize adverse visual effect on the environment. Blade glint and shadow flicker shall be avoided to the greatest extent possible.

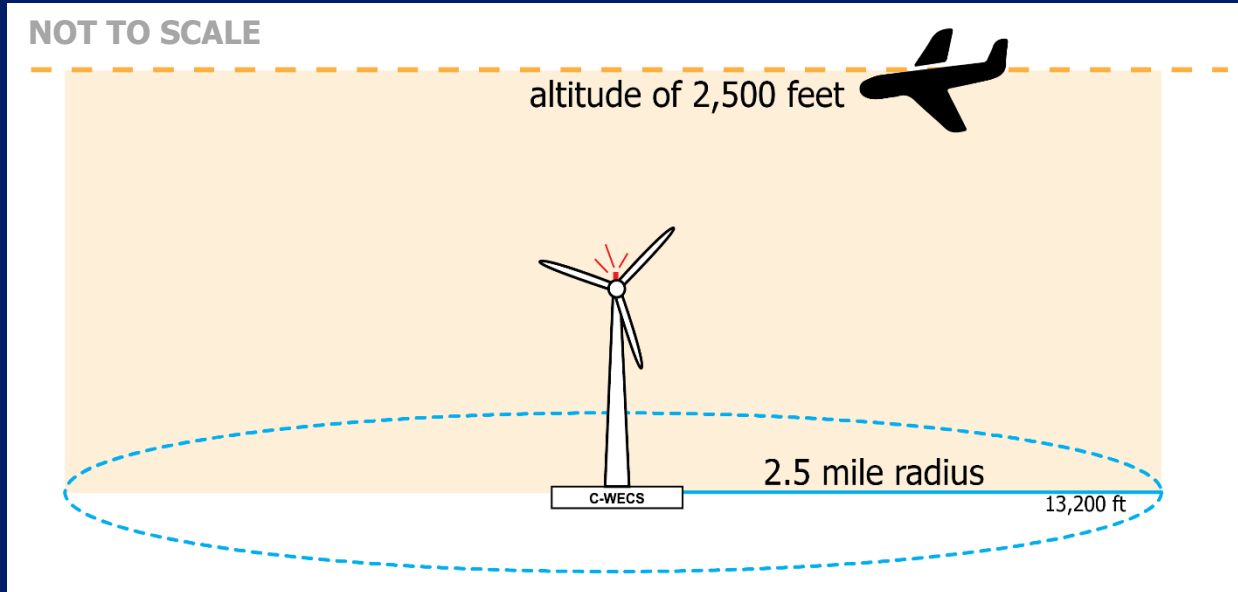
Lighting of turbines shall be **radar activated** and in compliance with current FAA Aircraft Detection Lighting System regulations. Any emergency reserve lighting shall follow “daytime white / nighttime red” standards.



# C-WECS Lighting



## Radar activated lighting system (ADS)



This is a system regulated by the FAA which would turn a light atop the turbine on only when an airplane goes below 2,500' altitude in an area less than 2.5 miles away from a turbine.

Otherwise the light would remain off.



# C-WECS Building Permit



- Once approved applicant has 2 years to begin construction.
- Affidavit recorded with Register of Deeds referencing the CUP, date and expiration.
- Building Permit documentation.
- Term of CUP = Maximum 25 years.
- Special Inspections at applicant's expense.
- Compliance of CUP conditions.



# C-WECS Revision Process



Establishes a difference between minor revisions and major revisions and the process for evaluating both after a plan has been approved.

**Minor Revisions** may be approved through the administrative site plan process and must be mutually agreed upon by the Zoning and Codes Director and the Planning Director.

Changes may include:

- Change in location of project-interior turbines subject to all setbacks and other siting requirements;
- Modifications to project phasing;
- Changes which do not adversely affect the adjacent non-participating property owner(s).

**Major Revisions** will require approval of a new conditional use permit.

Changes may include:

- Expansion of the project area;
- Increase in turbine height;
- Additional turbines than approved;
- Changes which may adversely affect the adjacent non-participating property owner(s);
- All major changes must be approved by the BoCC subject to public notice standards.



# C-WECS Abandonment, Decommissioning, & Reclamation



A decommissioning and reclamation plan shall be required to ensure that facilities are properly removed and the land is reclaimed at the appropriate time. This plan shall be revisited and evaluated every five years unless otherwise specified by the Board of County Commissioners.

Such Security shall be in the form of a letter of credit, a cash escrow account, a performance bond, or other form of Security which is acceptable to the County.

The Security shall be in an amount equal to 100% of the estimated decommissioning and reclamation costs and shall be adjusted for inflation.

The Security must be written so as to survive any sale or transfer of the C-WECS project.

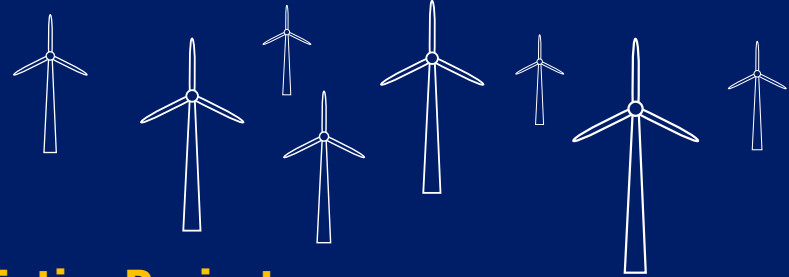


# C-WECS Abandonment



## Individual Turbine

Considered abandoned when the turbine is incapable of producing at least 20% of the average amount of electricity it has produced previously for at least six consecutive months and there is no demonstrated viable plan to restore the equipment to operating condition.



## Entire Project

Considered abandoned when 50% or more of the individual turbines in any Wind Farm are abandoned, and there is no demonstrated viable plan to restore the equipment to operating condition within one year, except in the case of an Extraordinary Event subject to a County approved schedule of completion.



# C-WECS Reclamation



Required to commence reclamation proceedings within 90-days of the date of abandonment

Two ways reclamation can be initiated:

- Initiated by Operator.
- Initiated by the County with notice to Operator.

If the Operator fails to remove the C-WECS and reclaim the site, the Governing Body may remove or cause the removal of the C-WECS and the reclamation of the site. The County may recover the cost of decommissioning and reclamation from the Operator, the Participating Landowner, and the Security.



# Timeline



Date	Action
12/7/22	Publish Revised Draft Regulations
12/14/22	Mid-Month Study Session with Planning Commission
12/19/22	Planning Commission receive Text Amendment. <b>Public hearing opens.</b>
1/12/23	Community Meeting (Greenbush School, 6pm-9pm)
1/23/23	Planning Commission receive update on text amendment. <b>Public hearing continues.</b>
1/30/23	Staff to host open house in Riverfront City Hall (2pm-7pm)

**TODAY**  
→





# Timeline



Date	Action
2/5/23	Public Comment on Revised Wind Regulation Text will close (11:59PM)
2/20/23	Planning Commission receive update on text amendment. Staff to present analysis and summary of “what we heard” throughout 60-day public comment period. <b>Public hearing continues.</b>
3/8/23	Tentative Planning Commission Mid-Month meeting. Staff to present new revised regulations from previous guidance and changes made as a response to public comment.
3/20/23	Planning Commission consider recommending approval to Board of County Commissioners. <b>Public hearing closes.</b>



## Staff Recommendation



Receive staff report and draft text language,  
provide comment/feedback on proposed language.

Dedicated email address: [windregs@lawrenceks.org](mailto:windregs@lawrenceks.org)

[www.lawrenceks.org/windregs](http://www.lawrenceks.org/windregs)