NC CLEAN ENERGY TECHNOLOGY CENTER

SOUTHEASTERN WIND COALITION

Carolinas Development Assistance and Siting Hub

NOVEMBER 2026

CAROLINAS UTILITY-SCALE WIND MODEL ORDINANCE



Disclaimer & Acknowledgements

This material is based upon work supported by the U.S. Department of Energy Office of Critical Minerals and Energy Innovation's (CMEI) Integrated Energy Systems Office through the Reliable Energy Siting through Technical Engagement and Planning (R-STEP) program. R-STEP is administered with support from the Partnership Intermediary Agreement (PIA) that the U.S. Department of Energy (DOE) has established with ENERGYWERX.

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This material was prepared as part of the Carolinas Development Assistance and Siting Hub (DASH), which provides education and technical assistance on reliable energy siting and permitting issues for local governments and communities in North and South Carolina. The NC Clean Energy Technology Center leads the initiative in collaboration with the NC Cooperative Extension, the Southeastern Wind Coalition, the South Carolina Energy Office, and the Center for Energy Education.



Carolinas Utility-Scale Wind Model Ordinance

Introduction

The Carolinas Development Assistance and Siting Hub (DASH), a program led by the NC Clean Energy Technology Center (NCCETC), developed a wind model ordinance in collaboration with the Southeastern Wind Coalition (SEWC).

As of the most recent update to the Carolinas DASH local ordinance database in early 2026, 38% of North Carolina counties and 15% of South Carolina counties have specific regulations on wind permitting. Though North Carolina has a statewide Wind Energy Facility (WEF) permitting process, adoption of a wind ordinance at county or municipal levels can help to increase transparency and efficiency by proactively defining local standards and addressing community concerns and priorities.

This model ordinance provides consensus input on best practices that balance the responsible development of wind energy resources with local county considerations and needs. It is intended to be used as a resource template rather than a one-size-fits-all solution. In this way, this model ordinance provides valuable guidance and best practices while still allowing flexibility for local governments that may need to address other local interests. This model ordinance is provided for informational and advisory purposes only. It is not intended as legal advice, and users should not rely on it as such. The provisions contained herein may not be suitable for adoption without modification. Local government officials are strongly encouraged to consult with their legal counsel before considering or enacting any ordinance regulating utility-scale wind energy. Each locality should carefully evaluate how the language in this model ordinance may need to be adapted to reflect local conditions, including comprehensive plans, existing land use and zoning regulations, and community priorities.

This document also includes appendices that address additional topics and resources relevant to communities and other WEF stakeholders but which were not deemed appropriate for inclusion in the body of the model template ordinance.

The drafting process for this model ordinance included revisions based on stakeholders' written feedback and a virtual session where stakeholders convened for discussion and feedback. The stakeholders included representatives from government and planning, agricultural and environmental sectors, academia, wind energy

developers, and utility-scale energy advocacy organizations. This model ordinance was drafted, developed, and vetted with the help of our stakeholders, named in Appendix A.

Recommended Ordinance Adoption Protocol

This template is not law, but rather carefully crafted guidance for municipalities and counties to consider when adopting ordinances specific to wind development in their jurisdiction. The authors of this template emphasize that the standards must be tailored to local land development ordinances. Sections within the template that include ***values in brackets*** are intended to present possible options and items that are jurisdiction-specific. The template ordinance may also be applied in non-zoned jurisdictions upon the modification and approval of the authorizing agency. Furthermore, the adoption of an ordinance will not supersede any existing federal, state, or local rules pertaining to the development of a project.

This document also includes appendices that address additional topics and resources relevant to communities and other WEF stakeholders, but which were not deemed appropriate or expanded upon for inclusion in the body of the template ordinance. These topics include, for example, local benefit mechanisms and community engagement.

Living Document

As with previous model ordinance iterations, this model ordinance, as a living document, will continue to evolve with the regional policy landscape and new information. The document is no longer in the working document stage; however, readers may contact NCCETC and/or the Southeastern Wind Coalition by emailing either ccflanag@ncsu.edu or dsire-admin@ncsu.edu (NCCETC) or jocelynj@sewind.org (SEWC) with feedback for potential consideration and incorporation.

Stakeholders Available for Contact*

*List indicates stakeholders available for contact surrounding the model ordinance and wind development. A stakeholder organization's inclusion in the list does not necessarily indicate endorsement of the ordinance or its provisions.

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S.C. Coastal Conservation League Taylor Allred taylora@scccl.org	**Southern Alliance for Clean Energy** Stacey Washington stacey@cleanenergy.org

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Utility-Scale Wind Model Ordinance

1. Purpose

a. The purpose of this ordinance is to facilitate the construction, installation, and operation of utility-scale WEFs in the [County/Municipality] of _____ in a manner that promotes economic development and ensures the protection of public health, safety, and general welfare while also preserving the character of the community. It is the intent of this ordinance to encourage the development of utility-scale WEFs that bolster local economic development and job creation, support the diversification of the state's energy portfolio, strengthen energy and grid security, reduce local air and water pollution, and reduce reliance on foreign and out-of-state energy resources. This ordinance is not intended to abridge safety, health, or environmental requirements contained in other applicable codes, standards, or ordinances. The provisions of this ordinance shall not be deemed to nullify any provisions of local, state, or federal law.

b. This model ordinance provides standards for the siting, design, construction, operation, and decommissioning of utility-scale WEFs within [County/Municipality]. These standards are intended to provide a clear, predictable, and transparent framework for reviewing and permitting WEFs in a manner that can be adopted by the [County/Municipality]. It seeks to balance the benefits of wind energy development with the interests of landowners, neighboring properties, and the broader community by establishing reasonable, objective standards for project development, operation, and long-term stewardship.

2. Definitions

a. "Aircraft Detection Lighting System (ADLS)" is a sensor-based system that detects aircraft approaching a WEF and automatically activates the facility's aviation obstruction lights when needed for aircraft safety, allowing the lights to remain off when aircraft are not within the system's designated detection or activation area, consistent with applicable Federal Aviation Administration requirements.

b. "Applicant" is the person or entity filing an application under this Ordinance.

c. “Meteorological Tower” (“MET Tower”) means a Tower used for the measurement and collection of wind data that supports various types of equipment, including but not limited to anemometers, data recorders, and solar power panels. MET Towers may also include wildlife-related equipment such as acoustic bat detectors, bird diverts, and wildlife entanglement protectors.

d. “Nonparticipating Residence” means a residence that is located on nonparticipating property and that is existing and occupied on the date that an application for a permit to develop the WEF is filed with the [County/Municipality].

e. “Nonparticipating Property” means real property that is not a participating property.

f. “Operator” means the entity responsible for the day-to-day operation and maintenance of the WEF.

g. “Occupied Community Building” means any one or more of the following buildings that are existing and occupied on the date that the application for a permit to develop the WEF is filed with the [County/Municipality]: a school, place of worship, childcare facility, public library, or community center.

h. “Participating Residence” means a residence that is located on participating property and that is existing and occupied on the date that an application for a permit to develop the WEF is filed with the [County/Municipality].

i. “Participating Property” means real property that is the subject of a written agreement between a WEF owner and the owner of the real property that provides the WEF owner an easement, option, lease, or license to use the real property for the purpose of constructing a WEF, or ancillary equipment.

j. “Shadow Flicker” means alternating changes in light intensity caused by the movement of Wind Turbine blades casting shadows on the ground or a stationary object.

k. “Tip Height” means the distance measured from the surface of the tower foundation to the highest point reached by the tip of a rotor blade when the blade is in a fully vertical position.

l. "Wind Energy Facility" ("WEF") means an electric generating facility of 1 MW or more, whose main purpose is to supply electricity, consisting of one or more Wind Turbines and other accessory structures and buildings, including substations, meteorological towers, electrical infrastructure, transmission lines, and other appurtenant structures and facilities.

m. "Wind Energy Facility Owner" ("WEF Owner") means the entity or entities with an equity interest in the WEF, including their respective successors and assignees.

n. "Wind Turbine" means a wind energy conversion system that converts wind energy into electricity through the use of a Wind Turbine generator and includes the nacelle, rotor, tower, and pad transformer, if any.

3. Applicability

a. This ordinance applies to all utility-scale WEFs or any major modification to an existing utility-scale WEF for which a complete permit application or complete permit modification, as applicable, was submitted after the effective date of this Ordinance.

b. Changes to an approved application for a WEF that do not materially alter the initial site plan may be administratively approved by the [Zoning Administrator]. Major modifications that would materially alter the impact of the WEF project under the approved [Special Use/Conditional Use Permit] will require a [permit/permit modification] under this ordinance and approval in the same manner as the original permit. A major modification is defined as an expansion of the project boundary [by more than 10%]; an increase in the size, number, or rated capacity of turbines or other WEF components; or a change in the location of turbines or other WEF components. A decrease in the number of turbines or the relocation of any turbine on the site plan within the project boundary is not a Major Modification so long as the turbine locations conform to development standards of the ordinance.

c. This Ordinance shall not apply to stand-alone Wind Turbines constructed primarily for residential or agricultural use or to offshore WEFs.

d. This Ordinance shall not apply to routine maintenance, repair, or like-kind replacement of equipment.

e. This Ordinance is not intended to supersede regulations from local, state, and federal agencies.

f. WEFs may be permitted under this ordinance with a [Special Use Permit/Conditional Use Permit] as designated in [County/Municipality's Use Table], subject to the following standards:

4. Design

a. Height restrictions
    i. Each Wind Turbine shall not exceed the height allowed under the Determination of No Hazard for that turbine from the Federal Aviation Administration (FAA) Obstruction Evaluation / Airport Airspace Analysis under 14 CFR Part 77.
b. Setbacks
    i. Setbacks are related to the tip height of the Wind Turbine.
        1. Occupied Community Buildings: 2.1 x maximum tip height
        2. Participating Residences: 1.1 x maximum tip height
        3. Nonparticipating Residences: 1.5 x maximum tip height
        4. Participating Property Lines: setbacks between participating property lines are commonly waived.
        5. Nonparticipating Property Lines: 1.1 x maximum tip height
        6. Public Road Rights-of-way: 1.1 x maximum tip height
    ii. Setback provisions may be waived if the following conditions are met: 1) Property owners may waive the setback requirements by signing a waiver of their rights. 2) The written waiver shall notify applicable property(s) of the setback required by this Ordinance, describe how the WEF is not in compliance, and state that consent is granted for the WEF to waive the setback as required by this Ordinance. 3) Any such waiver shall be signed by the applicant, the Participating Property and/or Non-Participating Property, and recorded in the Deeds Office where the property is located.
    iii. The WEF shall comply with [County/Municipality] [wetland protection ordinance/wetland buffer ordinance/critical line and setback ordinance] as applicable.
c. Visual Appearance
    i. A Wind Turbine shall not be lighted artificially, except to the extent consistent with Federal Aviation Administration (FAA) recommendations or other applicable authority that regulates air

safety or as is otherwise required by another governmental agency with jurisdiction over the WEF.

1. The [County/Municipality] may encourage the WEF applicant to submit an application to the FAA for an Aircraft Detection Lighting System (ADLS) or other appropriate lighting mitigation technology, concurrently with the application for a determination of no hazard to air navigation for the proposed WEF.

ii. A Wind Turbine shall not be used to support signs and shall not display advertising except for reasonable and incidental identification of the turbine manufacturer, WEF owner and operator, and for warnings.

d. Sound & Shadow Flicker
   i. Audible sound from a WEF, as measured at the nearest outer wall of any Participating Residence, shall not exceed any auditory limits established for the applicable land use zone. In the absence of underlying noise standards, audible sound from a WEF shall not exceed fifty-five (55) dB, as measured at the nearest outer wall of any Participating or Nonparticipating Residence and Occupied Community Building. Where setback and noise requirements conflict, the more stringent requirement shall apply. In the case that a project is found to be noncompliant, the WEF applicant shall submit a noise mitigation plan to [County/Municipality].
   ii. Shadow flicker shall be limited to thirty (30) hours per year at non-participating residences or occupied community buildings.
   iii. Noise and/or shadow flicker provisions may be waived if the following conditions are met: 1) Property owners may waive the noise and/or shadow flicker provisions of this Ordinance by signing a waiver of their rights. 2) The written waiver shall notify applicable property owner(s) of the noise and/or flicker limits required by this Ordinance, describe how the WEF is not in compliance, and state that consent is granted for the WEF to waive noise and/or flicker limits as required by this Ordinance. 3) Any such waiver shall be signed by the applicant and the Non-Participating Property Owner(s) and recorded in the Deeds Office where the property is located.

e. Security and safety standards
   i. Wind Turbines and accessory equipment and facilities must comply with the National Electrical Safety Code 11 and other applicable

standards as outlined by the [County/Municipality] ordinances. Fencing[1] should provide security around associated facilities such as an O&M building and substation to prevent unauthorized access. A security fence must be equipped with a minimum of one gate and a locking mechanism on the primary access side. Security fences, gates, and warning signs must be maintained in good condition until the WEF is decommissioned and removed from the site. Fencing shall not be required around Wind Turbines that are secured by a locked turbine tower door.

5. Permit

a. Permit Application
   i. Wind Energy Permit Application: Before a building permit may be submitted for a WEF, a [Special Use/Conditional Use Permit] Application for the facility must first be approved by the [Planning Commission/other designated body].
   ii. Application timeline should adhere to the following timeline or the [County/Municipality] review timeline:
      1. Completeness determination within [30] calendar days, public hearing within [45] days of completeness, and approval or denial within [120] days of receipt, extendable by up to [120] days by joint agreement of the applicant and the [County/Municipality].

b. Community Meeting:[2]
   i. Before a WEF application for a [Special Use Permit/Conditional Use Permit] is accepted as complete, the applicant shall conduct a community meeting.
   ii. Meeting Guidelines:
      1. Time and place: A community meeting shall be held at a place that is convenient and generally accessible to community members that reside in proximity to the land subject to the application, such as a public library, school, community center, town hall, or other public or commonly used venue within the county or municipality where the

[1] Local jurisdictions may have specific zoning laws and/or building codes that dictate fencing requirements, including height, materials, and setback distances from property lines, which should be taken into consideration for consistency. "National Electric Safety Code" (NESC) is a set of safety standards that set the ground rules and guidelines for practical safeguarding of utility workers and the public during the installation, operation, and maintenance of electric supply, communication lines and associated equipment. Per regulations, a fence of at least 6 ft (with 3-strand barbed wire) or 7ft in height must enclose the electrical components of a wind facility. Common fencing is chain link or wildlife/gamefencing where appropriate.

[2] Authors have included optional community meeting requirement language for jurisdictions that would like to encourage early community engagement in their ordinance. Please refer to Appendix B: Explanation Guide for further detail.

project is proposed, and at reasonable times that allow for sizeable community attendance, such as between 5:30 p.m. and 8:00 p.m. on a weekday or between 9:00 a.m. and 5:00 p.m. on a weekend day, but not during a federal or state holiday.

   a. Attendance levels, or the absence of any particular resident, shall not affect the validity of the meeting or the completeness of the application.
   b. The location shall comply with applicable accessibility requirements.

2. Notification:
   a. An applicant shall provide notification of the community meeting a minimum of 10 days, but not more than 25 days, in advance of the meeting, by mail, to all residents within [1 mile] of the tract subject to the WEF application and [County/Municipality] staff.
   b. The notification shall state the time and place of the meeting, include a vicinity map and short description of the project, a proposed site plan for the proposed project, and state the purpose of the meeting.
   c. At least one sign shall be placed by the applicant, at least 10 days in advance of the meeting, so that it may be seen from an abutting street. If the sign is placed on a property that has two street frontages, a sign shall be posted on both frontages. The sign shall state the time, place, and purpose of the meeting.
3. Information provided: The applicant shall provide the following information to those attending the meeting:
   a. The purpose of the community meeting;
   b. A description of the proposed development;
   c. The development review procedure(s) the application would follow;
   d. The potential for changes in the development proposal as it proceeds through the review process;
   e. Sources of further information about the development review process; and
   f. Any additional information that would promote understanding of the development proposal.

4. Conduct of meetings: At the community meeting, an applicant shall explain the development proposal and application, answer any questions, and respond to concerns community members have about the application and proposed ways to resolve conflicts.
5. Staff attendance: [County/Municipality] staff shall not attend a community meeting in a professional capacity to afford an opportunity for the meeting to focus on the merits of the project and the dialogue between the applicant and the community meeting attendees.

iii. Written summary: The applicant shall provide the [County/Municipality clerk] an affidavit certifying at least one community meeting was held.

iv. Applicant actions: If an applicant is required or requested to conduct a community meeting and does not do so or does not demonstrate a reasonable effort was made in the notification of such meeting, that fact shall be noted in the staff report on the application and may be just cause for the denial of the application.

c. General Information

i. MET Towers may be erected to test the wind conditions at that site and do not require approval of a Wind Energy Permit Application. However, each such temporary pole or tower shall comply with the dimensional requirements of this Article plus any other applicable ordinances. A copy of an FAA determination report as a result of filing the FAA Form 7460-1, Notice of Proposed Construction or Alteration of an Object that may Affect the Navigable Airspace, shall be submitted prior to submission of any building permits for such a temporary pole or tower.

1. The temporary pole or tower may be any height, but it must be set back by a distance at least equal to its height, allowing setbacks to be waived by the participating property owners.
    a. Setback provisions may be waived if the following conditions are met: 1) Property owners may waive the setback requirements for Participating Residences and/or Non-Participating Residences by signing a waiver that sets forth the applicable setback provision(s) and the proposed changes. 2) The written waiver shall notify the applicable property(s) of the

setback required by this Ordinance, describe how the MET Tower is not in compliance, and state that consent is granted for the meteorological tower to waive the setback as required by this Ordinance. 3) Any such waiver shall be signed by the applicant, the Participating Property, and/or the Non-Participating Property and recorded in the Deeds Office where the property is located.

2. The temporary pole or tower may not have any signs; may not be illuminated, except as required by the FAA or Department of Defense; and must be removed within the end date of the [County/Municipality] [Special Use Permit/Conditional Use Permit] time period, unless the [Planning Commission/relevant body] grants a [1-year] extension.

6. Application

a. WEF Permit Application Information: Any application for a utility-scale WEF will contain the following information. Where a utility-scale WEF requires a [Special Use Permit/Conditional Use Permit], the general requirements for such a permit outlined in [County/Municipality] zoning code will also apply:

   i. Project summary:

      1. A narrative describing the proposed WEF, including an overview of the project;
      2. Identification and location of the properties on which the proposed WEF will be located;
      3. A description of the applicant, WEF owner, and operator, including their respective business structures; including the names, addresses, and phone numbers of the applicants, owners, and operators, and all property owners;
      4. The proposed total rated capacity of the WEF;
      5. The proposed number, representative types, and height or range of heights of Wind Turbines to be constructed, including their generating capacity, dimensions, and respective manufacturers, and a description of ancillary facilities.

   ii. Site plan:

1. A site plan showing the planned location of all Wind Turbines, anchor bases (if any), primary structures, property lines (including identification of adjoining properties), setback lines, access roads and turnout locations, substation(s), electrical cabling from the WEF to the substation(s), ancillary equipment, building(s), and transmission and distribution lines. The site plan must also include the location of all structures and properties, demonstrating compliance with the setbacks.
2. A vegetation management plan for construction and operations.

iii. Letters of consent to construct from all surface property owners on which the WEF is located.

iv. Environmental Compliance:
   1. An applicant shall comply with, and receive the necessary permits for, relevant local, state, and federal environmental and wildlife laws prior to commencing construction and operating the utility-scale WEF.[3]
   2. An applicant shall notify and consult with relevant local, state, and federal environmental jurisdictions and agencies regarding the proposed project and potential protected resources that may be present before submission of a site plan application. An applicant shall describe any avoidance, minimization, and/or mitigation measures for protected resources incorporated into the project plan.

v. Certifications and Further Compliance:
   1. An applicant shall provide certification of compliance with applicable local, state, and Federal regulations, such as FAA and FCC regulations, including but not limited to:
      a. Written certification that the FAA Obstruction Evaluation forms have been submitted to the FAA in accordance with FAA requirements (FAA Form 7460-1, Notice of Proposed Construction or Alteration).
   2. Any other information required by the [County/Municipality] as part of its zoning regulations, including all studies, reports, certifications, and approvals demonstrating

[3] North Carolina statute requires an environmental assessment for large WEFs, which shall be provided for review by the applicant to the agency point of contact and to the state clearinghouse for distribution. The applicant must also present a certification of distribution of the Environmental Assessment. South Carolina statute requires a Stormwater NPDES [CZMA compliance] permit to be obtained from the South Carolina Department of Environmental Services.

compliance with the provisions of all applicable federal, state, and local regulations. This may include, but is not limited to, a noise analysis or shadow flicker analysis to ensure compliance.[4]

3. All relevant permits must be granted before commencing construction.

vi. Decommissioning plans consistent with the requirements of Section 7(b) that describe the anticipated life of the WEF, the estimated decommissioning costs in current dollars, the method for ensuring that funds will be available for decommissioning and restoration, and the anticipated manner in which the WEF will be decommissioned and the site restored.

vii. Signature of the Applicant.

b. Throughout the permit process, the Applicant shall promptly notify [County/Municipality] of any proposed changes to the information contained in the permit application that would alter the impact of the WEF.

c. Changes to the approved application that do not materially alter the size, type, location, rated capacity, or number of Wind Turbines or other major equipment in the site plan will be considered a minor modification and may be adopted administratively.

7. Decommissioning

a. Ending Commercial Operations and End of Useful Life:

i. Failure to generate electricity from a WEF for a continuous period of twelve (12) months shall constitute the ending of commercial operations and the end of the useful life of the WEF. This twelve (12) month period may be extended if the WEF owner provides a showing of good cause to the [Planning Commission/relevant body] or if substantial evidence is provided to the [Planning Commission/relevant body] of the intent to maintain and reinstate operation of the facility, with such evidence updated every three (3) months following the initial twelve (12) months of non-operation.

ii. The WEF owner shall have twelve (12) months to complete decommissioning of the WEF upon ending commercial operations and at the end of its useful life. This period may be extended by the

[4] Note that North Carolina General Statute Chapter 143 Article 21C requires a noise analysis and shadow flicker analysis to be submitted as a part of state-level utility-scale wind permitting. Accordingly, accepting such analyses, rather than requiring separate analyses, is likely sufficient.

[County/Municipality] if evidence is provided that the delay is due to circumstances beyond the WEF owner's reasonable control.

b. Prior to construction, the Applicant shall prepare a written decommissioning plan, which shall be prepared, signed, and sealed by a professional engineer licensed in [North Carolina/South Carolina], that provides the steps to be taken to decommission the WEF and restore the site. At a minimum, a decommissioning plan shall include all of the following steps:
    i. Remove Wind Turbines, buildings, fencing, cabling, electrical components, roads, and any other associated facilities down to thirty-six (36) inches below grade. Any agreement for removal to a lesser depth or for no removal shall be recorded with the [County/Municipality] and shall show the locations of all such foundations.
    ii. Recycle all of the components thereof that are practicably capable, including consideration of commercial reasonableness, of being recycled. Components that will not be shipped for reuse, are incapable of being recycled, and do not meet the definition of hazardous waste shall be properly disposed of in (i) an industrial landfill or (ii) a municipal solid waste landfill.
    iii. Restore the property (i) as nearly as practicable to its condition before the WEF was sited or (ii) to an alternative condition agreed upon in a written contract or lease agreement between the property owner and the system owner; this may include a property owner request that access roads or other land surface areas not be restored. The condition of the property shall otherwise comply with any applicable statutory requirements, rules adopted thereunder, and requirements in local ordinance.

c. Prior to construction, the Applicant shall provide financial assurance, which shall take the form of a bond or irrevocable letter of credit in favor of the [County/Municipality] in an amount equal to [100%] of the estimated decommissioning cost of the WEF, less the salvage value of the equipment. Estimates shall be determined by a third party [North Carolina/South Carolina]-licensed professional engineer. If the WEF owner elects to use a letter of credit, it shall be issued by a federally chartered bank.
    i. The bond or letter of credit shall remain in full force and effect until any necessary site restoration is completed to restore the site to a condition comparable to that which existed prior to the issuance of

the Permit or an alternative condition agreed upon per Section 7(b)(ii), as applicable.

ii. The decommissioning plan shall be reviewed and updated at least once every five (5) years to reflect current estimated decommissioning costs. The bond or letter of credit shall be renewed in increments of five (5) years, with the amount of financial security adjusted annually in accordance with changes in the Consumer Price Index (CPI) and updated as necessary based on revised decommissioning cost estimates to ensure sufficient funds are available to cover decommissioning costs until the project is decommissioned. A copy of the updated decommissioning plan shall be provided to the [County/Municipality].

d. The transfer or assignment of ownership of a WEF, construction permit, or project shall not be effective unless the new owner or assignee assumes all obligations under the approved Decommissioning Plan and provides evidence of adequate decommissioning financial security, as required by the [County/Municipality]. The terms of the decommissioning plan shall be binding upon the owner, operator, and their respective successors, assigns, and heirs.

Ordinance created using original language and language from American Clean Power's Utility Scale Wind Model Ordinance (2026); Carteret County, North Carolina Ordinance Meteorological Tower provisions; Chowan County, North Carolina Land Use Regulations Section 19.110: Wind Energy Facilities (2026); City of Wilmington, North Carolina Ordinance Section 18-566: Pre-application meeting; Conservation Voters of South Carolina et al.'s South Carolina Solar and Storage Model Ordinance (2025); NC Clean Energy Technology Center's North Carolina Utility-Scale Solar and Storage Model Ordinance (2026); North Carolina G.S. Chapter 143 – Article 21C: Permitting of Wind Facilities; and North Carolina Wind Working Group's Model Wind Ordinance for Wind Energy Facilities in North Carolina (2008).

Appendices

Appendix A: Stakeholder Organization List*

* List represents organizations contacted for feedback and/or invited to stakeholder feedback sessions.

- American Clean Power Association
- Apex Clean Energy
- Avangrid Renewables
- Audubon North Carolina
- Cape Fear Council of Governments
- Chowan County
- Clemson University
- Clean Carolinas
- Coastal Conservation League
- Conservation Voters of South Carolina
- Dare Strategies
- Dominion Energy North Carolina
- Duke Energy
- Environmental Defense Fund
- Freese and Nichols
- Georgetown County
- Interfaith Power & Light
- Kairos Government Affairs
- Midlands Council of Governments
- Municipal Association of South Carolina
- National Wildlife Federation
- National Laboratory of the Rockies
- North Carolina Coastal Federation
- North Carolina Conservation Network
- North Carolina Department of Agriculture and Consumer Services
- North Carolina Department of Commerce
- North Carolina Farm Bureau
- North Carolina Sustainable Energy Association
- Parker Poe
- Perquimans County
- Pivot Generation
- Renewable Energy Farmers Association
- Santee Cooper
- ScottMadden
- Sierra Club
- South Carolina Association of Counties
- South Carolina American Planning Association
- South Carolina Environmental Law Project
- South Carolina Energy Office
- Southern Alliance for Clean Energy
- Southern Environmental Law Center
- Sustaining Way
- SWCA Environmental Consultants
- Waccamaw Council of Governments

Appendix B: Explanation Guide

1. **Blade Color:** Blade color is largely set by federal aviation rules. The FAA calls for turbines to be painted white, with light gray as the darkest acceptable shade. Local color requirements could conflict with that standard, so the model ordinance does not set its own and leaves the color to FAA requirements. Jurisdictions that want a non-reflective finish can address it through a condition of approval, as long as the finish remains FAA-compliant.

2. **Blade Tip Height vs. Hub Height**: A turbine is most commonly measured to the hub (nacelle) or to the blade tip at its highest point. These definitions matter for requirements on a given project; for example, the FAA evaluates each turbine based on tip height, the highest possible measurement above ground. Because hub height is always lower than tip height, a setback keyed to hub height would be shorter and less protective. This ordinance therefore uses maximum tip height for all setbacks to allow it to change appropriately with taller technology.

3. **Community Notification Alignment:** In the case of utility-scale WEFs, which are commonly subject to Special Use Permits or Conditional Use Permits, community notification of a project is commonly addressed through the existing Special Use Permit/Conditional Use Permit processes. Specifically, applicants are often required to notify property owners adjacent to the proposed project or within a certain radius of the proposed project about the project application as a part of the process.

The authors have included in ordinance section 5(b) optional community engagement provisions that place an emphasis on community notification. These provisions stipulate that applicants must hold and file records of a community meeting before they submit their application. Jurisdictions may consider including such community meeting requirements, as well as pre-application meetings with planning staff, for utility-scale wind projects to encourage community engagement before an application is finalized.[5] Additional examples from the following jurisdictions may help inform key requirements such as (1) how far in advance a community meeting should be held, (2) who should be notified and how, and (3) how evidence of a community meeting should be recorded:

a. Chatham County, North Carolina, requires applicants to hold a community meeting prior to submission of a Special Use Permit application and to submit a record of the meeting with their application. Applicants must include certification that written notice was given by first-class mail to adjacent property owners.

[5] Note that in North Carolina, General Statutes Chapter 143 Article 21C requires WEFs with 1 MW of capacity or greater to adhere to the state permitting process. The state process requires the Department of Environmental Quality to invite parties, including the board of commissioners for each county and the governing body for each municipality in which the proposed facility or facility expansion is located and local governments with jurisdictions over areas where a major military installation is located, to a preapplication scoping meeting. The Department must also hold a public hearing in each county in which the facility is proposed to be located within 75 days of receipt of a completed permit application, with procedures for notice and public comments.

b. Wilmington, North Carolina, requires applicants to schedule a neighborhood meeting prior to submission of a Special Use Permit. Applicants must provide mailed notice to property owners within 300 feet; they must also post signage on property visible to abutting streets.
c. Charlotte, North Carolina, has published community meeting instructions related to conditional rezoning (a separate process not to be confused with a Special Use Permit/Conditional Use Permit). However, community engagement practices from the guide are still broadly applicable.

Please also reference Appendix D: Community Engagement for best practices.

4. **Environmental Assessments:** Developers conduct or commission environmental assessments to identify potential site constraints, including wetlands, protected species, cultural resources, and floodplains. These assessments may involve desktop reviews and field surveys to verify site conditions and identify potential environmental impacts. Findings help developers adjust project layouts to avoid or minimize impacts and determine whether mitigation measures are needed. Developers also use these assessments to identify permitting requirements, prepare technical documentation, and coordinate with relevant agencies.

5. **Fencing**: The ordinance requires fencing around facilities that people could enter and be harmed by: the O&M building and the substation, which contain high-voltage equipment. Fencing is not required around individual turbines secured by a locked tower door, because the door already controls access to the interior, and a fence adds land disturbance without improving safety. Wildlife fencing is always encouraged where appropriate.

6. **Lighting**: The FAA sets marking and lighting for each turbine based on its height. If the FAA determines that obstruction lighting is required for a WEF, the County/Municipality may require the WEF to submit an application for light-mitigating technology, like Aircraft Detection Lighting Systems (ADLS), where applicable. See definition. The FAA decides case by case whether ADLS may be used and appropriate. The ordinance therefore does not require ADLS, but a county can encourage applicants to apply. The system must comply with applicable FAA regulations and any other federal requirements governing the use of aircraft detection lighting systems, including approval for spectrum allocation from the Federal Communications Commission (FCC).

7. **Setback Multiples:** A setback can be a fixed distance or a multiple of turbine height, such as 1.1 times the height. A multiple scale automatically adjusts as turbines get taller, so the ordinance does not need amending when equipment changes.

8**. Shadow Flicker**: Shadow flicker is the alternating light and shadow created when rotating blades pass between the sun and a viewer, usually when the sun is low in the sky. Regulators and developers commonly use a design goal of 30 hours per year of expected flicker at occupied structures. The ordinance adopts the figure because it is widely recognized and gives

applicants a predictable target. A developer can follow simple mitigation measures, such as screening trees at an affected residence or adjusting the layout or programming turbines to shut down during the specific periods when flicker would occur.

9. **Sound**: On average, land-based, utility-scale Wind Turbines produce sounds that fall in the range of 35–45 dB when heard from 300 meters away. That means they are no louder than a typical refrigerator (50 dB). This model ordinance uses “nearest outer wall of a building” because measuring sound from property lines would be highly restrictive for project areas.

10. **Vegetation Management Plans**: Vegetation management plans typically outline how vegetation will be protected, cleared, restored, and maintained throughout a WEF’s lifecycle. Before and during construction, they identify areas to preserve, establish clearing limits, and describe measures to minimize land disturbance. After construction, they guide revegetation of disturbed areas, monitor restoration success, and address erosion and invasive species. During operations, they outline ongoing vegetation maintenance around turbines, access roads, and other infrastructure while considering wildlife habitat and existing land uses.

Appendix C: Local Benefits Mechanisms (LBMs)

Local Benefits Mechanisms (LBMs), an umbrella term that includes Community Benefits Agreements (CBAs), help communities attain specific funding or services. LBMs may provide a wide range of local benefits, including tax revenue and economic growth, education and workforce, community investment, environmental stewardship efforts, and job creation. They also involve a wide variety of defining characteristics and structures. To ensure that LBMs accurately reflect community interests and provide meaningful benefits, it is essential to establish strong, early, and ongoing communication between local government and developers, while also engaging representatives who are directly connected to the community and understand its interests and needs.

CBAs are voluntary agreements between developers and a community group or local government. Language requiring a CBA or consideration of a CBA was not included in the model ordinance due to the authors' understanding that requiring a CBA through an ordinance would not comply with local jurisdictions' authority under North Carolina General Statute § 160D and may not align with the conditions that local South Carolina jurisdictions are able to impose. However, optional language requiring early engagement with communities and planning authorities has been included in ordinance section 5(b). This process may allow community representatives to more effectively negotiate their priorities with developers. Separately, local jurisdictions may consider entering into development agreements to receive public benefits. Local jurisdictions are encouraged to review South Carolina Code of Laws § 6-31-10 and North Carolina General Statute § 160D-1001 for relevant statutory development agreement requirements.

Developers, local government, and community members are also encouraged to review the Carolinas DASH LBM resource: Carolinas DASH Local Benefits Mechanisms Guide

Appendix D: Community Engagement

A guide for developers on best practices for community engagement beyond required community meetings or project notification, pulled from the Utility-Scale Solar and Storage Model Ordinance for South Carolina – an effort that the NC Clean Energy Technology Center participated in, in addition to a number of other conservation and agricultural organizations, developers, and utilities, among others.

Engage Early

1. Begin outreach before permit applications or final route/site selections
2. Explain the purpose and need for the project in plain language to the community
3. Be transparent with the timeline, including decision points and public input opportunities

Prioritize Transparency & Two-Way Communication

1. Give clear, consistent updates (i.e., websites, local media, etc.)
2. Be honest about trade-offs, and be clear about what is and isn't open for negotiation

Respect Local Knowledge & Lived Experience

1. Involve landowners, community leaders, and local organizations from the start
2. Incorporate feedback into design decisions
3. Host listening sessions to understand concerns around land use, health, and equity
4. Consider local benefits mechanisms to support community development

Make Engagement Inclusive & Accessible

1. Schedule events at convenient times and locations
2. Offer language interpretation and ADA accommodations
3. Provide printed materials and virtual participation options for rural or under-connected communities

Stay Engaged After Groundbreaking

1. Designate a community liaison for ongoing communication through construction and operations
2. Provide regular updates on progress and mitigation
3. Establish a system for feedback, complaints, or questions to be heard and addressed promptly

Examples of Successful Engagement Tools

1. Community Advisory Committees
2. Interactive Project Maps & Dashboards
3. Pop-up Info Booths at Local Events
4. Landowner Working Groups

5. Co-hosted town halls with local leaders and developers, in partnership with counties, are encouraged to consult with local soil and water conservation districts and farmland protection boards/advisory committees when reviewing proposed projects to ensure siting decisions align with long-term working land conservation goals.

Based on best practices from the U.S. Department of Energy, the National Laboratory of the Rockies (NLR), Lawrence Berkeley National Laboratory, the Solar Energy Industries Association (SEIA), and the National Association of Regulatory Utility Commissioners (NARUC).

Appendix E: Common Permits for Clean Energy Projects*

Federal

- National Environmental Protection Act Study (NEPA)- covers the entire environmental picture of the site
- Environmental Survey Assessment (Phase I ESA)
- Wetland Delineation
- Agency permits (US Army Corp of Engineers and US Fish & Wildlife Service)

South Carolina State

- Archaeological Study submitted to the State Historic Preservation Office
- Obtain interconnection agreement with utility (takes 2 years for all the studies)
- Obtain a Certificate of Public Convenience and Necessity (CPCN) and/or a Certificate of Environmental Compatibility and Public Convenience and Necessity (CECPCN) from the Public Service Commission (PSC) when applicable
- Obtain NPDES Permit - Stormwater from the SC Department of Environmental Services

North Carolina State

- Obtain a Wind Energy Facility permit from NC Department of Environmental Quality's Division of Energy, Mineral and Land Resources
- Provide an environmental assessment to the agency point of contact and to the state clearinghouse for distribution
- Obtain Certificate of Public Convenience and Necessity (CPCN) from the North Carolina Utilities Commission for any WEF over 2 MW
- Obtain interconnection agreement with utility

Local

- Permitting process with local jurisdiction
- Construction & Electrical Building Permits
- Optional Fee in lieu of tax agreements with the County (or PILOT-Payments in lieu of taxes)
    - South Carolina has a statewide program (see "Fee in Lieu of Tax Simplification Act"), while local North Carolina governments may arrange for PILOT agreements in certain circumstances

*Federal, South Carolina State, and Local details pulled from the Utility-Scale Solar and Storage Model Ordinance for South Carolina – an effort that the NC Clean Energy Technology Center participated in, in addition to a number of other conservation and agricultural organizations, developers, and utilities, among others.

Appendix F: Resources

American Clean Power Utility-Scale Wind Energy Conversion Systems Model Ordinance Framework

Department of Energy WINDExchange

Iowa, Calhoun County, Wind Energy Conversion System Ordinance

Land-Based Wind Energy Guidelines

Maine State Planning Office Model Wind Energy Facility Ordinance

Massachusetts Wind Model Ordinance

National Laboratory of the Rockies Decommissioning, Repurposing, and Recycling

North Carolina General Statute Chapter 143 – Article 21C: Permitting of Wind Facilities

North Carolina Utility-Scale Solar and Storage Model Ordinance

North Carolina Utility-Scale Wind Model Ordinance (2008)

Pennsylvania Wind Model Ordinance

South Carolina Utility-Scale Solar and Storage Model Ordinance

South Dakota, Roberts County, Wind Energy System Ordinance