

TOWN OF ANTRIM, NEW HAMPSHIRE
LARGE SCALE WIND ORDINANCE

- 1.0 **Title.** This ordinance shall be known as the Town of Antrim Large-scale Wind Ordinance.
- 2.0 **Purpose.** The purpose of this Ordinance is to provide for the development and use of wind power as an alternative energy source, benefiting both the economy and the environment, while protecting public health, safety and general welfare, preserving environmental, historic and scenic resources, controlling noise levels and preventing electromagnetic interference. This ordinance provides a permitting process to insure compliance with requirements and standards established therein.
- 3.0 **Authority.** This Ordinance is adopted pursuant to the enabling provisions of NH RSA 674:16 and NH RSA 674:1, V. In addition, pursuant to the provisions of NH RSA 674:21, the Antrim Planning Board is hereby granted the authority to issue Conditional Use Permits for the construction or operation of Large-scale Wind Energy Facilities, including meteorological towers within the Town of Antrim, subject to these provisions.
 - 3.1 **Conflicts with Other Ordinances and Regulations.** If there is a conflict between provisions in this Ordinance or between a provision in this Ordinance and a provision of any other ordinance or regulation, this Ordinance shall apply.
 - 3.2 **Validity and Severability.** Should any section or provision of this Ordinance be declared by the courts to be invalid, such a decision shall not invalidate any other section or provision of the Ordinance.
- 4.0 **Effective Date.** This Ordinance shall become effective on the date of its passage.
- 5.0 **Applicability.** Large-scale Wind Energy Facilities (LWEFs) and meteorological towers (met towers), as defined below are allowed to be constructed or operated in any district in the Town of Antrim after the effective date of this Ordinance, subject to all applicable federal, state, and local ordinances and regulations.
 - 5.1 Meteorological towers, whose purpose are to analyze the environmental factors needed to assess the potential to install, construct or erect a LWEF, are subject to the same process as LWEFs if the intent is to leave the towers in place permanently . If the tower is intended to be temporary and will be removed within three years, only 7.1.1 (Design, Manufacture) 7.2.1 (Setbacks), 7.1.2.1 (Height), and 7.1.6 (Color) of this ordinance shall apply.
- 6.0 **Definitions.**
 - 6.1 Ambient Noise – Intermittent noise events present for at least 90% of the time.
 - 6.2 Blade Glint – The intermittent reflection of the sun off the surface of the blades of a wind turbine.
 - 6.3 dBA – “A-Weighting” means a frequency response adjustment of a sound level meter with an American National Standards Institute (ANSI) defined A-weighting filter. The A-weighting filter approximates the human ear’s response to various frequencies. Measurements made with this weighting are designated dBA.
 - 6.4 dBC – “C-Weighting” means a frequency response adjustment of a sound level meter with an ANSI defined C-weighting filter. The C-weighting filter analyses the signal with approximately equal weight to all frequencies. Measurements made with this weighting are designate dBC.
 - 6.5 Large-scale Wind Energy Facility (LWEF) – An electricity-generating facility, with a generating capacity of over 100 kilowatts, consisting of one or more wind turbines, including

any substations, met towers, cables/wires, and other structures accessory to the facility.

- 6.6 Met tower – A meteorological tower used for the collection of wind data associated with a LWEF.
- 6.7 Repowering – To retrofit a LWEF to the latest technology in order to improve efficiency and capacity. Generally this involves the installation of a new generator or turbine.
- 6.8 Setbacks – The distance a LWEF is set back from abutting property lines, structures, or other features.
- 6.9 Shadow Flicker – The effect when the blades of an operating wind turbine pass between the sun and an observer, casting a readily observable, moving shadow on the observer and the immediate environment.
- 6.10 Total Height – When referring to a wind turbine or a LWEF, the height measured from the finished grade at its location to the top of the blade extended to its highest point.
- 6.11 Tower Shadowing – The outline created on the surrounding area by the sun shining on a wind turbine.
- 6.12 Wind Turbine – A wind energy conversion system that converts wind energy into electricity through the use of a wind turbine generator, including the turbine, blade, tower, base, and pad transformer, if any.

7.0 Standards.

7.1 Design, Manufacture, and Construction Standards

- 7.1.1 The design and manufacture of all meteorological towers, all wind turbines, and all other components of a LWEF shall conform to applicable national, state, and local standards for the wind industry, such as those established by the American National Standards Institute (ANSI), Underwriters Laboratories, and similar certifying organizations.
- 7.1.2 Height. Consideration shall be given to the scale of the turbines in relation to the surrounding landscape, but in no case shall the height of a LWEF tower exceed 500 feet, as measured from the finished grade at the tower base to the highest tip of turbine blade.
 - 7.1.2.1 The maximum height allowed for any Met tower is 200 feet, and the tower must be designed so as not to require lighting in compliance with FAA regulations. Guy wires are allowed, but must be designed so as to limit environmental hazards to wildlife, especially birds and bats.
- 7.1.3 All collector lines and interconnect lines shall be below the tree line except where tied into existing transmission lines. Underground power and transmission lines shall be buried at a depth consistent with State public utility engineering standards to prevent transient ground currents and stray voltage.
- 7.1.4 LWEFs shall be equipped with a redundant braking system that includes both aerodynamic over-speed controls (including variable pitch, tip, and other similar systems) and mechanical brakes. Mechanical brakes shall operate in fail-safe mode. Stall regulation shall not be considered a sufficient braking system for over-speed protection.
- 7.1.5 LWEF towers, not including met towers, shall be mounted on monopole towers with no guy wires.

- 7.1.6 The color of LWEF towers and met towers shall be off-white or grey or some other unobtrusive color approved by the Planning Board.
- 7.1.7 LWEFs shall not be used to display signs or advertising except for signs at ground level identifying the turbine manufacturer, the LWEF Owner/Operator, emergency contact information, and appropriate warnings as required by national, state, and local laws.
- 7.1.8 **Blasting.** All blasting shall be in accordance with the appropriate sections of “the New Hampshire Department of Transportation’s Standard Specifications for Road and Bridge Construction”.
- 7.1.9 **Modification During Construction.** If at any time it appears necessary or desirable to modify the approved plans before or during construction of the LWEF, the Planning Board’s designated agent is authorized to approve minor modifications due to unforeseen circumstances such as encountering hidden outcrops of bedrock or groundwater. The Board’s agent shall issue any approval under this section in writing and shall transmit a copy of the approval to the Planning Board. Revised plans shall be filed with the Planning Board for the record. For major modifications such as relocation of rights-of-way or of LWEF towers, changes in grade by more than 2% for roadways and 5% for other changes, the Applicant shall submit to the Planning Board an amended plan for review, approval, or ratification.

7.2 Public Health and Safety Standards

- 7.2.1 **Setbacks.** LWEFs must be sited so as to satisfy the setbacks for the following: tower or turbine collapse, debris and ice throw, shadow flicker, and blade glint. Setbacks shall be no less than 1.5 times the maximum height of the wind turbine from the nearest property line. Wind turbines must be sited no less than five (5) times the turbine height from occupied buildings. The Planning Board shall waive this provision if the waiver request in 13.2.1 is supported by the affected property owner(s). The Planning Board shall waive the setback if it meets the acoustic standards set forth in section 7.2.2. Additional setbacks may be required to meet noise standards in 7.2.2.

- 7.2.1.1 The applicant shall submit a graph of the required setback for each hazard as a circle for a single unit or as a series of connected arcs for multiple units centered on each turbine and submitted with the required setback graphically superimposed to scale on town maps identifying lot owners, structures, and lot property lines.

- 7.2.2 **Acoustics.** Sound pressure levels due to the operation of the LWEF shall not exceed levels set forth herein at occupied structures in the Town of Antrim identified through the application process; additional consideration may be given to day, night and summer levels, as well as impact on residences within the sound study area as determined in 7.2.2.2.

- 7.2.2.1 Sound pressure levels at occupied structures shall not exceed 5 dBA above preconstruction ambient levels with a maximum of 45 dBA daytime, (6:00 am to 8:00 pm), and 43 dBA nighttime, (8:00 pm to 6:00 am). DBC levels shall not be more than 25 dB above the preconstruction ambient dBA level. Preconstruction ambient levels shall be assumed to be 25 dBA and 30 dBC. The Planning Board shall waive this provision if it is supported by the affected property owner as per 13.2.1.

- 7.2.2.2 Prior to permit approval, a pre-construction sound measurement study shall be conducted at occupied structures within one (1) mile of any proposed wind

turbine if requested by the property owner and/or the Planning Board. Testing outside of one(1) mile may be required by the Planning Board if unique conditions of the surrounding topography or other factors exist that reasonably appear to affect sound propagation. The Planning Board shall give consideration to a property owner's timely request as to where on the property the tests will be conducted. Tests shall be conducted using both A-weighted (dBA) and C-weighted (dBC) scales. A 5 dBA penalty shall be applied for tonal noise. This is a single tone or limited frequency noise (vs. broadband noise) associated with mechanical noise artifacts (i.e. high-pitched whining, screeching, buzzing).

- 7.2.2.3 All sound measurements shall be made by a professional acoustical engineer approved by the Planning Board who is a Full Member of the Institute of Noise Control Engineering (INCE) or who possesses some comparable qualification.
- 7.2.2.4 Except as specifically noted otherwise, sound measurements shall be conducted in compliance with the latest version of the American National Standards Institute (ANSI) Standard S12.18-1994 "Outdoor Measurements of Sound Pressure."
- 7.2.2.5 Sound level meters and calibration equipment shall comply with the latest version of ANSI Standard S1.4 "Specifications for General Purpose Sound Level Meters," and shall have been calibrated at a recognized laboratory within one (1) year before the sound measurements are carried out.

7.3 Environmental Standards

- 7.3.1 **Environmentally Sensitive Areas.** An application for a LWEF permit shall demonstrate appropriate measures for protecting, minimizing, and/or mitigating impacts to wetlands, vernal pools, seeps or springs, steep slopes (equal to or greater than 15%), watersheds, flood plains, significant habitat for wildlife, fish, and plants during both construction and operation of the LWEF.
- 7.3.2 **Ground Water Quality Protection.** LWEFs shall be designed, constructed, and maintained so as to avoid adverse impacts to groundwater, including sand and gravel aquifers.

7.4 Visual Impacts.

All available mitigation techniques to reduce the visual impacts of the wind energy project to neighboring residential, cultural resource areas, public recreational and scenic areas shall be considered using methods prescribed by Clean Energy States Alliance Clean Energy Program Guide Visual Impact Assessment Process for Wind Energy Projects, May 2011 or subsequent updates.

8.0 Requirements

- 8.1 **Hazardous Materials.** The Owner/Operator of any LWEF shall be responsible for compliance with all ordinances, regulations, and laws applicable to the generation, storage, cleanup, and disposal of hazardous materials resulting from the LWEF.
- 8.2 **Public Utility Impact.** The Planning Board may consult the New Hampshire Public Utility Commission, a transmission owner, and/or the regional grid operator concerning impacts on the existing infrastructure.

- 8.3 **Shadow Flicker.** LWEFs shall be designed and sited in a manner that does not result in shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on neighboring or adjacent uses.
- 8.4 **Fire Prevention Plan.** The Application for a LWEF shall include a Fire Prevention and Firefighting Plan prepared by a licensed Fire Protection Engineer in consultation with the Antrim Fire Chief, and approved by the Planning Board.
- 8.4.1 The plan shall include the incorporation of self-contained fire protection system in the turbine nacelle.
- 8.4.2 The plan shall include a response plan to address all potential LWEF fire scenarios and include a list of hazardous materials that may be encountered, and provisions for any additional firefighting or rescue personnel, services, training, materials, and vehicles as may be required to deal with any emergency related to the LWEF that is beyond the current capabilities of the Antrim Fire Department. Any associated costs to meet identified needs shall be fully borne by the Owner/Operator.
- 8.5 **Road and Property Risk Assessment.** Applications for a permit to construct a LWEF shall include a Road and Property Risk Assessment prepared by a licensed engineer. The assessment shall document road conditions prior to the construction of the LWEF, and again within thirty (30) days after construction is complete. Any road damage determined by the engineer to have been caused by the Applicant or his contractors shall be promptly repaired at the Applicant's expense. The Town may bond the roads in compliance with state regulations, and the bond is to be paid by the Applicant prior to the transport of LWEF components.
- 8.6 **Wildlife Protection.** Applications for a LWEF shall include a Wildlife Protection Plan based on pre-construction field studies designed and carried out by a qualified wildlife biologist approved by the Planning Board. Such studies shall describe the possible adverse effects of the LWEF on birds, bats, animals and their habitats, and shall propose remedies for these effects, all consistent with the studies recommended in the US Fish and Wildlife Service's "Wind Turbine Guidelines Advisory Committee Recommendations," dated March 4, 2010 or subsequent updates. The Owner/Operator shall implement the Wildlife Protection Plan.
- 8.7 **Hazardous Wastes.** The Owner/ Operator shall be responsible for compliance with all state and federal regulations applicable to the use and disposal of hazardous wastes involved in or generated by the LWEF's construction and operation. This responsibility shall extend to safe and lawful disposal of the by-products of any Acid Rock Testing and Mitigation Plan.
- 8.8 **Hazardous Lighting Mitigation.** All LWEFs shall be designed and sited to minimize nighttime light pollution and shall not exceed the minimum requirements by the Federal Aviation Administration. Red lights shall be used in place of white whenever possible and shall be shielded to the greatest extent possible from viewers on the ground. The Applicant shall provide a lighting plan showing all exterior building and ground lighting pertaining to the LWEF project. At the time of turbine upgrade for any other reason, and at such time that better, less intrusive hazard lighting technology becomes available, the Planning Board may require the Owner or Operator to upgrade the LWEF to such standards.
- 8.9 **Visual Impact Assessment.** Whenever a LWEF is proposed for a site that is visible from any of Antrim's scenic or special resources as identified in the Town's Master Plan and Open Space Plan, the Applicant shall provide a Visual Impact Assessment as presented in the Clean Energy State Alliance Program Guide: A Visual Impact Assessment Process for Wind Energy Projects May 2011 or subsequent issues or replacement documents.
- 8.10 **Post Construction Studies.** Following completion of construction of a LWEF, studies to

ascertain its actual effect on environmental resources shall be conducted by qualified professionals, approved by the Planning Board, including but not limited to those described below. The Planning Board may waive these requirements according to 13.2.1.

8.10.1 Wildlife Protection Field Study. Within three (3) years of completion of a LWEF, a field study to ascertain any actual effects on wildlife shall be conducted by a qualified wildlife biologist, approved by the Planning Board, consistent with the US Fish and Wildlife Service’s “Wind Turbine Guidelines Advisory Committee Recommendations,” dated March 4, 2010, or subsequent updates. If these studies demonstrate adverse effects on wildlife caused by the LWEF, the Owner/Operator shall design and implement an appropriate mitigation plan to be approved by the Planning Board.

8.10.2 Groundwater Quality Study. Within two (2) years after completion of construction of a LWEF, a Water Quality study shall be designed and carried out by a water quality professional licensed by the State of New Hampshire. If degradation or contamination is found to have occurred, the Owner/Operator shall design and implement an appropriate mitigation plan to be approved by the Planning Board. The study shall include groundwater, including sand and gravel aquifers, , and public water sources identified during the Application process.

8.11 Communication Interference. LWEF’s shall be designed and sited to prevent the disruption or loss of emergency or private radio, telephone, television, microwave, or similar signals. Any property owner in Antrim who believes that they are experiencing interference from the LWEF shall present their concerns to the Planning Board, who will meet with all parties in an effort to resolve the issues, based on the Resolution Plan submitted with the Application.

8.12 Notification of Extraordinary Event. The Owner/Operator of the any LWEF shall notify the Select Board and Planning Board of any “extraordinary event” immediately or at the latest within 24 hours after that event. Extraordinary events shall include but not be limited to tower collapse, catastrophic turbine failure, fires, leakage of hazardous materials, unauthorized entry into a tower base, thrown blade or hub, injury caused by the LWEF, and any other event that affects public health and safety.

9.0 Decommissioning. The Owner/Operator of the LWEF shall be fully responsible for the complete decommissioning of the LWEF within twelve (12) months after it ceases to generate electricity or its permit to operate has been revoked, subject to the following, unless the Owner/Operator continues to pay its financial obligations to the Town and fully maintains the LWEF in such a way that will allow the LWEF to begin operation again in the future, as determined by an engineer approved by the Planning Board.

9.1 Decommissioning shall include removal and disposal off-site of all parts of the LWEF (including foundations to two feet below grade) in accordance with local, state and federal laws and regulations, and the re-vegetation with native vegetation of the area according to a Site Restoration Plan.

9.2 A New Hampshire-licensed Professional Engineer approved by the Planning Board and paid by the Applicant shall estimate the total cost to decommission the LWEF without consideration of the salvage value of the parts, materials, or equipment. The amount of this estimate shall be the dollar amount of the bonding required at or prior to the date of issuance of formal approval by the Planning Board.

9.3 No approval will be granted nor permit issued for a LWEF until such time as a Decommissioning Fund, in form and amount acceptable to the Planning Board and Select Board, has been established. Decommissioning Funds may take the form of cash, a

Reclamation Bond issued by an insurance company with a Best Rating acceptable to the above stated municipal boards, or an Irrevocable Letter of Credit issued by a bank authorized to conduct business in the State of New Hampshire and acceptable to the above stated municipal boards.

- 9.4 Estimates of decommissioning expense shall be updated at least every five years subsequent to the anniversary date of the granting of a LWEF Permit, and the Owner/Operator of the LWEF shall be required to maintain Decommissioning Funds that are at least equal to the most recent estimate. Failure to update the cost of decommissioning shall constitute a default under the terms of approval.
- 9.5 If the Owner/Operator of the LWEF does not complete Decommissioning within the timeframe prescribed, the Town of Antrim may institute such legal action as may be allowed (including court action) to gain control of the Decommissioning Fund and to ensure to the extent that the Fund balance may allow, to complete or substantially complete, the Decommissioning requirement.
- 9.6 The Select Board and Planning Board, as joint Escrow Agents, may not release or reduce the amount of an established Decommissioning Fund where the Town is listed beneficiary of said Fund, without an affirmative vote, properly conducted and noticed, by both Boards. A detailed written request with a well-defined justification must be submitted by the Owner/Operator prior to the vote. The decision on the request will be provided to the Owner/Operator in writing within sixty (60) days of receipt of said request.

10.0 Application Procedure.

- 10.1 Applications for new and replacement LWEFs shall be filed and processed in accordance with the Town of Antrim Subdivision and Site Plan Review Regulations. The application for a Conditional Use Permit may be filed and processed concurrently with the Site Plan Review.
- 10.2 A LWEF is deemed to have regional impacts, therefore the procedure shall include notification as per NH RSA 36: 54-57.
- 10.3 Submission Requirements. In addition to the submission requirements for a Site Plan Review, applicants for a LWEF shall submit the following:
 - 10.3.1 Plans prepared and stamped by a New Hampshire-licensed professional engineer showing the location, shape, size, design and height of all proposed components of met towers and LWEF, including the proposed access to the project site and associated transmission lines.
 - 10.3.2 A location map to scale of current and planned land uses within the project boundary; and a line denoting a one-mile radius beyond the project boundary prepared by a New Hampshire-licensed land surveyor.
 - 10.3.3 A site grading and clearing plan that shows all areas to be cleared and all grade changes; the plan shall include details on the collector lines, locations and heights of poles, clearing limits for above-ground lines, substations, transmission line details, and upgrades or changes to existing power lines.
 - 10.3.4 Historical, Cultural, Archeological Resource Map prepared by New Hampshire-licensed land surveyor.
 - 10.3.5 Environmental Resource Map prepared by a qualified New Hampshire-licensed land surveyor.
 - 10.3.6 Intended period of data collection for the met tower.

- 10.3.7 Manufacturer’s certification of the non-reflecting properties of the external surfaces of the LWEF.
 - 10.3.8 Calculations and supporting data for all setbacks for each turbine.
 - 10.3.9 List of property owners whose property wholly or in part falls within the setback areas.
 - 10.3.10 Studies and reports as required by the Planning Board, including but not limited to the following. The cost of any required study, report, plan, mitigation effort, or other work required to be done by the Planning Board is the full responsibility of the applicant.
 - 10.3.10.1 Ambient Noise Level Study
 - 10.3.10.2 Fire Protection Plan
 - 10.3.10.3 Road and Property Risk Assessment
 - 10.3.10.4 Wildlife Protection Plan
 - 10.3.10.5 Groundwater Quality Studies
 - 10.3.10.6 Visual Impact Assessment
 - 10.3.11 A Resolution Plan to address any complaints from affected parties during construction and over the life of the operation. The Plan shall identify a contact person and a process for mediation.
 - 10.3.12 A Site Restoration Plan.
 - 10.3.13 Any other information deemed necessary by the Board in order to make an informed decision.
- 11.0 **Repowering.** When a LWEF is planned for a retrofit, the Owner/Applicant must apply to the Planning Board for approval before the LWEF may be repowered.
- 12.0 **Permit to Operate.**
- 12.1 Following construction of a LWEF, before commencing operation, the Owner/Operator shall apply to and receive approval from the Planning Board for a Permit to Operate. The application shall include the following:
 - 12.1.1 An Inspection Report prepared and signed by a New Hampshire licensed structural engineer certifying the structural and operational integrity of the LWEF, and completion of construction in accordance with all submitted and approved building, road, and lighting plans, and any other plans submitted to the Planning Board as required.
 - 12.1.2 Decommissioning Bond.
 - 12.1.3 A signed statement that the Applicant has read this Ordinance, understands all its provisions, and agrees to abide by them.
 - 12.2 A Permit to Operate shall be valid for twenty (20) years. Application for renewal requires Planning Board review and approval at a public hearing.
 - 12.3 Applications for a Permit to Operate or a Renewal Permit will be heard at the next regularly-scheduled Planning Board meeting for which adequate legal notice has been posted.

- 12.4 A Permit to Operate is not transferable to a new Owner/Operator. Prior to or upon transfer of the property/LWEF, the new Owner or Operator shall apply to the Planning Board for a new Permit to Operate.
- 12.5 All conditions of approval shall be reviewed by the Planning Board annually.
- 12.6 A Permit to Operate shall be revoked and the LWEF required to cease operations if the Select Board determines that there is a violation of any provision of this ordinance or other applicable regulations. The Permit shall not be reinstated until the Select Board is assured at a duly-noticed public hearing that all violations have been corrected.

13.0 Administration and Enforcement

- 13.1 This ordinance shall be administered by the Planning Board and enforced by the Select Board or its designated agent(s).
- 13.2 In the issuance of the Conditional Use Permit, the Planning Board may attach reasonable conditions to an approval that it deems necessary, or to minimize any burden on any person affected by the proposed LWEF. The Planning Board also may waive or modify the standards or requirements of this Ordinance only if the Board finds by majority vote following the public hearing that specific circumstances relative to the proposal or peculiar conditions pertaining to the land in question indicate that the waiver will not be contrary to the public interest and will properly carry out the spirit and intent of this Ordinance.
 - 13.2.1 Any landowner may grant a permanent easement or waiver to the Owner/Operator for any impacts of the LWEF on their property that is inconsistent with this ordinance (for example, setbacks, shadow flicker, etc.). The terms of the easement or waiver shall be part of the public hearing process, and shall be recorded in the Registry of Deeds. Upon receipt of the permanent easement or waiver, the Planning Board shall review such instrument and no construction shall begin until the Planning Board approves the easement or waiver.
- 13.3 **Third Party Review.** Pursuant to NH RSA 676:4-b, the Planning Board is authorized to require an applicant to reimburse the Board for expenses reasonably incurred by obtaining third party review for review and consultation during the review process, or for inspections during the construction phase, or for any post-construction inspections.
- 13.4 **Inspections and Monitoring.** The Planning Board and/or its designee may enter the site of a completed LWEF for the purpose of assuring compliance, investigating complaints, or assessing potential future occurrences or hazards that could arise. In such a case, the Board will provide the Owner/Operator with 48-hour telephone notice, followed by email notification for the record.
- 13.5 **Violations and Penalties.** Upon receipt of any convincing information, either written or verbal, the Select Board or its designated agent may institute appropriate corrective action. The Board or its designated agent will notify the Owner/Applicant in writing of the violation, the action needed to correct it and the timeframe for correction. If the violation is not corrected, the Select Board or its designated agent is authorized to take any action it deems appropriate by the authority provided under NH RSA 676:17.
- 13.6 **Grievances.** In the event an Antrim citizen has a grievance resulting from the construction or operation of a permitted LWEF, the citizen may bring the issue before the Select Board for redress.

- 14.0 **Appeals.** Any person aggrieved by any decision made by the Planning Board in administering this Ordinance may appeal to the New Hampshire's superior court system, as provided in RSA 677:15.