

Appendix C

**Wind Electric Systems
Renewable Energy Grant**

RENEWABLE ENERGY GRANT

Technical Worksheet for Wind Electric Systems – Instructions

Please carefully read all of the following information. With the help of your Installation Contractor, fully complete Sections A through D of the attached Technical Worksheet for Wind Electric Systems.

Installation Requirements

Installation Requirements:

Equipment installation must meet the following minimum requirements in order to qualify for the provisions of the NOFA; proposed deviations from the requirements will be considered, but they must be documented by the Applicant or Installation Contractor and approved by the Ohio Energy Office. These requirements are not all encompassing and are intended only to address certain minimum safety and efficiency standards.

A. Code Requirements

1. The installation must comply with the provisions of the National Electrical Code (NEC) and all other applicable local, state or federal codes or practices.
2. All required permits must be properly obtained and posted.
3. All required inspections must be performed (i.e., Electrical/NEC, Local Building Code Offices, etc).

B. Wind Turbine and Tower

1. All wiring must conform to the NEC. Overcurrent protection must be provided in accordance with the provisions of the NEC.
2. The wind turbine tower must be well-grounded and bonded in accordance with the provisions of the NEC and any other applicable codes.
3. Appropriate lightning protection and surge suppression must be installed in accordance with the provisions of the NEC and any other applicable codes.

C. Inverter and Controls

1. The inverter and controls must be properly installed according to the manufacturer's instructions.
2. The inverter must be certified as compliant with the requirements of IEEE 929 (including anti-islanding) and also compliant with UL 1741.
3. The system should be equipped with the following visual indicators and/or controls:
 - On/off switch
 - Operating mode setting indicator
 - AC/DC over current protection
 - Operating status indicator
4. Warning labels must be posted on the control panels and junction boxes indicating that the circuits are energized by an alternate power source independent of utility-provided power.
5. Operating instructions must be posted on or near the system.

D. Control Panel to Wind Turbine Wire Runs

1. Areas where wiring passes through ceilings, walls or other areas of the building must be properly restored, booted and sealed.
2. All interconnecting wires must be copper.
3. Thermal insulation in areas where wiring is installed must be replaced to "as found or better condition." Access doors to these areas must be properly sealed and gasketed.
4. Wiring connections must be properly made, insulated and weather-protected.
5. All wiring must be attached to the system components by the use of strain reliefs or cable clamps, unless enclosed in conduit.
6. All outside wiring must be rated for wet conditions and/or encased in liquid-tight conduit.
7. Wiring insulation located in areas with potential high ambient temperature must be rated at 90° C or higher.
8. All wiring splices must be contained in UL-approved workboxes.

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Technical Worksheet for Wind Electric Systems

Customer Name: _____ Application Number: _____
(Assigned by the ODOD)

A: Equipment Information

1. Wind Turbine Manufacturer: _____ Turbine Model Number: _____
2. Average Annual Wind Speed at Hub Height: _____ miles per hour, or _____ meters per second
3. Wind Turbine Power Output: _____ AC kW (from turbine power curve at average annual wind speed for site)
4. Number of Turbines: _____
5. Total Annual Wind System Output: _____ AC kWh [power output rating (line 3) x no. of turbines (line 4) x 8760hrs]
6. Inverter Manufacturer: _____ Inverter Model Number: _____
7. Inverter's Continuous AC Rating: _____ AC kW Number of Inverters: _____
8. Total Inverter Output: _____ AC kW (Inverter Continuous AC Rating x Number of Inverters)
9. Inverter's Peak Efficiency: _____ (refer to manufacturer's peak efficiency rating) (not applicable if manufacturer included inverter efficiency in performance ratings, e.g., performance rated in AC kW)
10. System Rated Output (for utility interactive systems): _____ AC kW (total wind system output (DC kW) x inverter peak efficiency, or total wind system output (AC kW))
11. Wind Tower Manufacturer: _____ Height: _____ Feet, or _____ Meters
12. Wind Tower Type: _____ Method of Anchoring: _____

B: Proposed Installation/Interconnection Information

1. Wind Turbine Location: _____
2. What percent (%) of the total annual load is the wind system designed to offset? _____
3. What is the topography within a ¼-mile radius of the proposed wind system? Check all that apply:
Terrain: Flat Shallow Variations Rolling Hills Steep Slopes Other (specify _____)
4. Wind Obstructions: Over 50-foot Trees Thirty- to 50-foot Trees
 One-story Structures Two-plus-story Structures
5. Wind Turbine Rotor Hub Height: _____ Feet, or _____ Meters
6. Wind Turbine Rotor Diameter: _____ Feet, or _____ Meters
7. Inverter Location: Indoor Outdoor Location: _____
8. System Type and Mode of Operation:
 utility interactive (parallel/capable of backfeeding the meter)
 utility interactive with battery backup (capable of backfeeding the meter)
9. A one-page site map must accompany this application. The map must indicate the location of the wind turbine(s), the inverter, batteries (if any), lockable disconnect switch and point of connection with the utility system.
10. A copy of the Interconnection and Net Metering Agreements must be sent to OEO before the grant will be issued.
11. What, if any, local zoning or siting restrictions may effect the project installation? (zoning approval documentation must be attached) _____
12. What, if any, local permits or licensed contractors will be required (attach all supporting documentation if required)? _____

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Technical Worksheet for Wind Electric Systems

Customer Name: _____

Application Number: _____
(Assigned by the ODOD)

C. Incentive Request Calculation

1. Total wind system output (Section A, line 5 above): _____ AC kWh x \$2.00/kWh = \$ _____

2. Wind turbine cost: \$ _____
Balance of system equipment cost: \$ _____
Installation cost: \$ _____
Interconnection related cost: \$ _____

Total Installed System Cost: \$ _____ x 0.4 = \$ _____

3. Maximum incentive allowed: \$200,000

4. Requested Incentive (Enter the SMALLEST number from C1, C2 or C3): \$ _____

D. Warranty Information

1. Wind Turbine: _____ Years

3. Inverter: _____ Years

2. Tower: _____ Years

4. Installation: _____ Years