



New Jersey Clean Energy Program

Technical Worksheet – Wind Equipment

Please read carefully all of the following information. With the help of your installation contractor, fully complete sections A through E of this Wind Equipment Technical Worksheet.

GENERAL TERMS AND CONDITIONS

Rebates will be processed based on the date *New Jersey's Clean Energy Program™* (NJCEP) approves the final paperwork packet, not on the purchase date of the equipment. Program procedures and rebates are subject to change or cancellation without notice. To qualify for a rebate, the applicant must comply with all *Renewable Energy Incentive Program* (REIP) eligibility requirements, terms and conditions, installation requirements and submit all completed forms. For more information about NJCEP or for assistance in completing applications or forms, please see NJCleanEnergy.com or call 866-NJSMART.

In order to determine eligibility for a REIP rebate this Wind Equipment Technical Worksheet must be submitted. The date this technical worksheet is received will determine eligibility for the REIP rebate and the order in which applications will be approved for rebates. The rebate calculation is determined using a NJCEP licensed calculation tool that is not publicly available. The rebate will be calculated by the program administrators.

Applicants considering turbines not listed on the approved list can participate in the program through the Innovative Wind Technology Incentive.

INSTALLATION REQUIREMENTS

Equipment installation must meet the following minimum requirements in order to qualify for a rebate. These requirements are not all-encompassing and are intended only to address certain minimum safety and efficiency standards. **All projects regardless of size must have an output meter that meets ANSI C.12 standards.**

A: CODE REQUIREMENTS

1. The installation must comply with the provisions of the National Electrical Code (NEC) and all other applicable local, state and federal codes or practices.
2. All required permits must be properly obtained and posted.
3. NJCEP inspection must be performed before the local Building Code Enforcement Office. If not, this may delay the processing of the rebate.
4. All required inspections must be performed (i.e., Electrical/NEC, Local Building Code, etc.). Note: In order to ensure compliance with provisions of the NEC, an inspection by a state-licensed electrical inspector is mandatory.

B: WIND TURBINE, ANEMOMETER AND TOWER

1. Approved turbines listed in this technical worksheet will be accepted for rebate. Applicants considering turbines not shown on the approved list can complete the Wind Alternative Calculation Method (WACM) for consideration by the program administrators.
2. All wiring must conform to the NEC. Overcurrent protection must be provided in accordance with the provisions of the NEC.
3. The wind turbine tower must be well-grounded and bonded in accordance with the provisions of the NEC and any other applicable codes.
4. Appropriate lightning protection and surge suppression must be installed in accordance with the provisions of the NEC and any other applicable codes.
5. An anemometer will be installed one rotor length below the swept area of the turbine and will face the direction of the predominant wind direction at the turbine location based on the wind rose data.
6. The output of the anemometer will have a data logger system that can be accessed to show instantaneous and average wind speed.
7. The data logger output can be transmitted either by card reader, a dedicated land line or web based system that can provide reporting information on the system.

C: INVERTER AND CONTROLS

1. The inverter and controls must be properly installed according to manufacturer's instructions.
2. The inverter must be certified as compliant with the requirements of IEEE 929 (including anti-islanding) and with UL 1741.
3. The system should be equipped with the following visual indicators and/or controls:
 - On/off switch
 - Operating mode setting indicator
 - Operating status indicator
 - AC/DC overcurrent protection
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 or on file with facilities operation and maintenance documents.
6. Systems must have monitoring capability that is readily accessible to the owner. This monitor (meter or display) must at minimum display instantaneous and cumulative production.



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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. (Some provisions may be made for aluminum wiring; approval must be received from utility engineering departments prior to acceptance.)
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. Insulation on any wiring 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.

E: BATTERIES (IF APPLICABLE)

1. The batteries must be installed according to the manufacturer’s instructions.
2. Battery terminals must be adequately protected from accidental contact.
3. DC-rated overcurrent protection must be provided in accordance with the provisions of the NEC.

APPROVED TURBINES FOR REBATES*

MANUFACTURER	MODEL	NAMEPLATE CAPACITY (kW)	MANUFACTURER	MODEL	NAMEPLATE CAPACITY (kW)
Abundant Renewable Energy	ARE 110	2.5	GE Energy	GE 1.6 xle	1600
Abundant Renewable Energy	ARE 442	10	Northern Power Systems	North Wind 100 (21m)	100
Aerostar	6 meter	10	Proven Engineering	WT6000	6
Bergey Windpower	BWC XL.1	1.0	Proven Engineering	WT15000	15
Bergey Windpower	BWC EXCEL - S	10	Southwest Windpower	Skystream	2.4
Endurance Wind Power	S-343	5	Cascade Engineering	Swift	1.5
Endurance Wind Power	G-3120	35	Turbowinds	T400-34	400
Endurance Wind Power	E-3120	50	Wind Energy Solutions	Tulipo	2.5
Enertech	E-44	40	Wind Energy Solutions	WES 18	80
Entegrity Wind Systems	EW15	50	Wind Energy Solutions	WES 30	250
GAIA Wind	11kW	11	Wind Turbine Industries (Jacob)	26-15	15
GE Energy	GE-1.5 sl/sle/xle	1500	Wind Turbine Industries (Jacob)	31-20	20

*Applicants must include with the application package the third party certified power curve for the turbine if the turbine proposed is not listed in the approved turbine list. All projects that include a turbine not on the approved list will participate in the Innovative Wind Technology Incentive Program. Rebates will be paid quarterly for the first year of installation on actual production from the turbine.



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A: APPLICANT INFORMATION

Original Application Date: _____ Or Revised Application Date: _____
 Customer Name: _____ Application Number: _____ (Only if revising an already approved application. This corresponds to REIP application form and is assigned by the program administrator.)

B: EQUIPMENT INFORMATION

1. Wind Turbine Manufacturer: _____ Turbine Model Number: _____
2. Wind Turbine Power Output: _____ AC Watts or _____ DC Watts (Peak output at 11 m/s) _____
3. Number of Turbines: _____
4. Inverter Manufacturer: _____ Inverter Model Number: _____
5. Inverter's Continuous AC Rating: _____ AC Watts Number of Inverters: _____
6. Total Inverter Output: _____ AC Watts (Inverter continuous AC rating x number of Inverters)
7. Inverter's Peak Efficiency: _____ (Refer to manufacturer's peak efficiency rating)
8. Will this project participate in the Innovative Wind Incentive Program? Yes No

C: PROPOSED INSTALLATION/INTERCONNECTION INFORMATION

1. Wind Turbine Location: _____ Latitude _____ Longitude _____
2. Average Annual Wind Speed at 50 meters: _____ MPH or m/s (Please include print out from wind resource maps)
3. Wind Turbine Rotor Hub Height: _____ feet, or _____ meters
4. Wind Turbine Rotor Diameter: _____ feet, or _____ meters
5. Inverter Location: Indoor Outdoor Location: _____
6. Utility-Accessible AC Disconnect Switch Location: _____
7. System Type and Mode of Operation:
 - Utility interactive (parallel/capable of back feeding the meter) with battery backup
 - Dedicated circuit, utility power as backup (transfer switch) with battery charging
 - Stand-alone (system confined to an independent circuit, no utility backup) with battery charging
8. A one-page site map must accompany this application. If this has already been provided in the pre-application than it is not necessary to provide an additional site map unless there have been changes. This document must indicate the location of the wind turbine(s) and any obstructions within 500' of the turbine and their associated heights and distance from the turbine, the inverter, batteries (if any), lockable disconnect switch, and point of connection with the utility system. NJCEP requires that the entire rotor diameter be 30' above any obstructions within 500'. If this is not possible, a site assessment may be required to validate the wind resource at the proposed site. The installation address, current account number at that address, and the installer's name and telephone number must also be included on the site map. If site elevation changes more than 10 feet within the 500 foot radius then a site topographical map must also be included.
9. Site pictures must also accompany this application. The best and preferred method is to take a series of photographs from the proposed turbine location. To do this, photograph the landscape view to the north and rotate 360° clockwise taking pictures every 45° until facing north again. This will result in eight photos detailing the installation site.

D: INCENTIVE REQUEST CALCULATION*** FOR NJCEP PROGRAM ADMINISTRATOR USE***

Incentives are based on estimated annual energy production (in kWh) for the proposed turbine at the specific site and hub height. Incentive calculation will be performed by the program administrators, based on wind speed maps as defined in the pre-application worksheet or from wind site assessments. Wind speed maximum for incentive calculation = 120% of reference wind speed, or a maximum of 13.7 MPH average annual wind speed. The Innovative Wind Incentive Program will estimate the annual production but will pay the rebate quarterly for the first year based upon actual production.

1. Estimated turbine performance from pre-application or wind alternative calculated method: _____
2. Incentive Calculation: **Residential systems are capped at a maximum 16,000 kWh**
 - Small Systems –**
 - a. (0-16,000 kWh/year estimated annual output) _____ X \$3.20/kWh = \$ _____
 - Large Systems –**
 - b. (16,000 to 1,000,000 kWh/year estimated annual output) = (_____ -16,000 kWh) X \$0.50/kWh + \$51,200 = \$ _____
3. Total Installed System Cost: \$ _____
 (Eligible installed system cost includes all equipment, installation, and applicable interconnection costs before NJCEP incentive.)
4. **Requested Incentive** (Enter the appropriate value from D2. a or b): \$ _____

E: WARRANTY INFORMATION

1. Wind Turbine: _____ Years
2. Inverter: _____ Years
3. Installation: _____ Years