

New Jersey Clean Energy Program

Technical Worksheet – Wind Equipment Information

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 Equipment, as well as the New Jersey Clean Energy Program Pre-Installation Application Form.

GENERAL TERMS AND CONDITIONS

Rebates will be processed based on the date the New Jersey Board of Public Utilities (NJBPU) approves the Final Application Form, 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, Applicant must comply with all Program Eligibility Requirements, Terms and Conditions, and Installation Requirements, and submit a completed Pre-Installation Application Form. For more information about the New Jersey Clean Energy Program, or for assistance in completing applications or forms, please see www.njcleanenergy.com or call 866-NJSMART

The pre-application wind worksheet is only an evaluation tool and is could be used as the first step in the evaluation process. In order to determine eligibility for a REIP rebate a Technical Worksheet for Wind Equipment should be submitted. The date of this Technical Worksheet will determine eligibility for the REIP rebate and the order in which rebates will be approved.

Currently the rebate calculation is determined using a New Jersey Clean Energy Program licensed calculation tool that is not available for general use. The Pre-application Wind Worksheet provides site specific wind resource information that has standard system derate factors. These derate factors will be used for all rebate calculations and can only be changed with input from a certified wind assessor, or based on the evaluation from a certified engineering company.

INSTALLATION REQUIREMENTS

Equipment installation must meet the following minimum requirements in order to qualify for payment under the provisions of the New Jersey Clean Energy Program; proposed changes to the requirements will be considered, but they must be documented by the Applicant or Installation Contractor and approved by the NJBPU. 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 and all other applicable local, state and federal codes or practices.
2. All required permits must be properly obtained and posted.
3. The NJBPU 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 Codes, 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. Only approved turbines less than or equal to 1 MW listed in the Frequently Asked Questions section of the NJ Clean Energy Program website will be accepted for rebates.
2. All wiring must conform to the National Electric Code. 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 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
 - 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.

New Jersey Clean Energy Program

Technical Worksheet – Wind Equipment Information

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.

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.

The following turbines are approved for rebates in New Jersey

MANUFACTURER	MODEL	MANUFACTURER	MODEL
Abundant renewable energy	ARE 110	Proven Engineering	WT6000
Abundant renewable energy	ARE442	Proven Engineering	WT15000
Bergey Windpower	BWC XL.1	Southwest Windpower	Skystream
Bergey Windpower	BWC EXCEL – R	Southwest Windpower	Whisper 100
Bergey Windpower	BWC EXCEL – S	Southwest Windpower	Whisper 200
EWP	Endurance	Southwest Windpower	Whisper 500
Enertech	E-48	* Ventera	VT 10
Fuhrlander	FL600	Vestas	V15 1ph
GAIA Wind	11kW	Vestas	V15 3ph
Entegrity Wind Systems	EW15	Vestas	V17
Energie	PGE 20/35 1 phase	Wind Energy Solutions	WES 5
Energie	PGE 20/35 3 phase	Wind Energy Solutions	WES 18
Energie	PGE 20/50	Wind Energy Solutions	WES 30
* Eoltec	Scirocco 6kW	Wind Turbine Industries (Jake)	23-10
Northern Power Systems	North Wind 100 (19m)	Wind Turbine Industries (Jake)	23-12.5
Northern Power Systems	North Wind 100 (20m)	Wind Turbine Industries (Jake)	26-15
Northern Power Systems	North Wind 100 (21m)	Wind Turbine Industries (Jake)	26-17.5
Proven Engineering	WT2500	Wind Turbine Industries (Jake)	31-20

New Jersey Clean Energy Program

Technical Worksheet – Wind Equipment Information

Customer Name: _____ Application Number: _____
 (Corresponding to Rebate Application Form and Pre-application) (Assigned by the NJBPU)

A: 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)

B: 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. The NJBPU 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.

C: ***For NJ REIP Staff Use*** INCENTIVE REQUEST CALCULATION

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 NJ REIP Market Manager Staff, 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*

Estimated turbine performance from Pre-application or alternative calculated method _____

Incentive Calculation:

- Small Systems –**
- a. (0-16,000 kWh/year estimated annual output) _____ X \$3.20/kWh = \$ _____
- Large Systems –**
- b. (16,000 to 750,000 kWh/year estimated annual output) = (_____ -16,000 kWh) X \$.5/kWh + \$51,200 = \$ _____

4. Total Installed System Cost: \$ _____
 (Eligible installed system cost includes all equipment, installation, and applicable interconnection costs before the New Jersey Clean Energy Program incentive.)

5. Requested Incentive (Enter the appropriate value from C2. a, b or c): \$ _____

D: WARRANTY INFORMATION

1. Wind Turbine: _____ Years 2. Inverter: _____ Years 3. Installation: _____ Years Revised January 2009