FY2014 *Renewable Energy Incentive Program* (REIP)
Sustainable Biopower Competitive Solicitation
Appendix C – Biopower Technical Worksheet

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

Program Terms and Conditions

To qualify for an incentive, the applicant must comply with all *Renewable Energy Incentive Program* (REIP) eligibility requirements, terms and conditions, installation requirements and submit all completed forms. All applications are evaluated by the Solicitation Evaluation Committee on the basis of the criteria set forth in the Solicitation. If approved by the Committee, projects requesting an incentive of $500,000 or greater will require an additional approval by the New Jersey Board of Public Utilities.

Equipment installation must meet the following minimum requirements in order to qualify for payment under the provisions set by NJCEP. Proposed changes to the requirements will be considered, but they must be documented by the applicant or installation contractor and approved by NJCEP. These requirements are not all-encompassing and are intended only to address certain minimum safety and efficiency standards. NJCEP incentives are contingent upon the applicant meeting all other program requirements, including but not limited to compliance with the host Electric Distribution Company's interconnection requirements and compliance with all applicable local state and federal laws, permit requirements and regulations.

Program Installation Requirements

1. The installation must comply with the provisions of the National Electrical Code (NEC) and all other applicable local, state, and federal codes and permit requirements or practices, including the National Standard Plumbing Code, the International Fuel Gas Code, and the New Jersey Bureau of Boiler and Pressure Vessel Compliance.
2. All required permits must be properly obtained and posted.
3. NJCEP inspection must be performed after the local building code enforcement office has inspected the project.
4. All required inspections must be performed (Electrical/NEC, local building codes enforcement office inspection, etc.). Note: In order to ensure compliance with provisions of the NEC, an inspection by a state-licensed electrical inspector is mandatory.
5. The installation must comply with manufacturer's instructions and with the interconnection and protection requirements of the local electric distribution company.
6. Generators must be properly installed according to manufacturer's instructions.
7. The installation must comply with provisions of IEEE 519 - Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems, as appropriate. Input and output protection functions should be in compliance with ANSI C37.2 Device Function Number specifications.
8. The installation of Combined Heat and Power (CHP) systems must also comply with provisions of NFPA 853 – Stationary Fuel Cell, and all codes governing the installation of Combined Heat and Power equipment; and ANSI Z21.83-1998 Fuel Cell Power Plants, as appropriate.
9. The system should be equipped with the following capabilities, indicators and/or controls:
   - On/off control on site
   - Operating mode setting indication - parallel vs. stand-alone
   - AC and DC overcurrent protection or equivalent
   - Operating status indicator
   - Remote control and data acquisition capability
   - Electric load-following capability
10. 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.
11. 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.)
12. System wiring must be installed in accordance with the provisions of the NEC.
13. All wiring splices must be contained in UL-approved workboxes.
14. Operating instructions must be posted on or near the system, or on file with facilities operation and maintenance documents.
15. All projects regardless of size must have a revenue grade kilowatt hour production meter that has been certified to the ANSI C12.1-2008 standards.

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A: Site Host Contact / Applicant Information

The name that appears on the REIP Application Form (Appendix A) must be the name that appears on this form. Please include applicant company name for non-residential projects.

B: Proposed Equipment Information (Power only)

Note: Complete <u>either</u> Section B (for Power only equipment) <u>or</u> Section C (for Combined Heat and Power equipment)

1. The equipment listed in this section of the REIP Biopower Technical Worksheet must be a true representation of the equipment proposed to install at the site covered by this submittal.
2. To determine the total system rated net continuous output, multiply the capacity rating per generator by the number of generators. This number must be calculated accurately to process the REIP application.

C: Proposed Equipment Information (CHP)

1. The equipment listed in this section of the REIP Biopower Technical Worksheet must be a true representation of the equipment proposed to install at the site covered by this submittal.
2. CHP systems with waste heat utilization must achieve annual system efficiency of at least 65%, based on total energy input and total utilized energy output. Mechanically-developed energy may be included in the efficiency evaluation.

D: Incentive Request and System Cost Information

Applicants **must** supply cost information that is accurate and has been updated to reflect the total installed cost of the proposed system as of the date of this submittal. REIP applications will not be processed without system cost information. Cost data will also be required with any revised worksheets submitted. Cost data can be submitted for protection under New Jersey's Open Public Records Act (OPRA) by following the Board's procedures found at www.nj.gov/bpu.

E: Warranty Information

Behind-the-meter systems must be covered by an all-inclusive warranty for at least five years from the date of installation to protect the purchaser against component or system breakdown. The warranty must cover all major components of the system against breakdown or degradation in electrical output of more than 10% from their originally rated electrical output during the five-year period. The warranty shall cover the full cost of repair or replacement of defective components or systems, including coverage for labor costs to remove and reinstall defective components or systems. The manufacturer and installer may provide the required warranty in conjunction, covering major system components and labor, respectively. An owner's manual, including warranty documentation, must be delivered to the customer on completion of the installation. In the event the system warranty does not meet program requirement, customer must purchase an extended warranty or a five year maintenance/service contract. The cost of the five year warranty or service contract may be considered as part of the cost of the project. ***Note: A copy of the warranty must be submitted with this REIP Biopower Technical Worksheet.***

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A: SITE HOST CONTACT / APPLICANT INFORMATION

Applicant Name: _____
Applicant Company Name: (if applicable) _____

B: PROPOSED EQUIPMENT INFORMATION (POWER ONLY)

Complete <u>either</u> Section B (for Power only equipment) <u>or</u> Section C (for Combined Heat and Power equipment)

1. Electrical Generator Equipment Type (i.e., gas engine, gas turbine, etc.)_____
2. Electrical Generator Manufacturer: _____
3. Model Number:_____
4. Energy Input (MMBtu): _____
5. Capacity Rating of each Electric Generator: _____AC Watts
6. Number of Electric Generators: _____
7. Total System Rated Net Continuous Output: _____ AC Watts (No. of Electric Generators x Capacity Rating)

C: PROPOSED EQUIPMENT INFORMATION (CHP)

1. CHP Equipment Type (i.e., gas engine, gas turbine, etc.) _____
2. CHP Equipment Manufacturer _____
3. Model Number _____
4. Primary use for thermal energy_____
5. Capacity Rating of each CHP system: _____AC Watts
6. Number of CHP systems: _____
7. Total System Rated Net Continuous Output: _____ AC Watts (No. of CHP systems x Capacity Rating)

Rated System Information		
Prime Mover Model		
Energy Input	(MMBtu/h)	
Rated Electric Output	(kW)	
	(MMBtu/h)	
Total Thermal Output	(MMBtu/h)	
Recoverable Thermal Output	(MMBtu/h)	
Fuel Conversion Efficiency (1)	(%)	

Proposed System Overview (annual)		
Prime Mover Type		
Energy Input	(MMBtu)	
Electric Output	(kWh)	
	(MMBtu)	
Recoverable Thermal Output	(MMBtu)	
Utilized Thermal Output (2)	(MMBtu)	
Annual System Efficiency (3)	(%)	

(1) – Fuel Conversion Efficiency (FCE) = (Rated Electric Output (MMBtu/h) + Recoverable Thermal Output)/Energy Input
FCE is defined as the ratio (expressed as a percentage) of the total usable energy produced by a technology to the sum of all fuel or other energy inputs to the technology measured at each fuel's higher heating value.
(2) – Utilized thermal output is heat used from the CHP systems for the purpose of heating and cooling 1kWh = 0.003412 MMBtu
(3) – Annual System Efficiency = (Electric output (MMBtu) + Utilized Thermal Output)/Energy Input

Please attach a separate sheet showing how the calculations in the chart above were made and the source of the data used.

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D: INCENTIVE REQUEST

1. Total system rated net continuous output (Section B or C, line 7 *above):* _____AC Watts

2. Estimated electric production in kWh for first 20 years of operation (from analysis document) _____

3. Projected cost per kWh of electric output for first 20 years of operation (from analysis document) _____

4. Requested Incentive: ***$***_____ ***(Maximum incentive is $750,000 per project and $1,125,000 per entity.)***

5. Requested incentive per kWh of projected electric generation for first 20 years of operation (Line D4 divided by Line D2) _____

6. Total Installed System Cost: $_____
   Eligible installed system cost includes all key system components, installation, and applicable interconnection costs before *New Jersey's Clean Energy Program* incentive, less any other direct incentives. These costs must be documented by invoices from the vendor(s), as well as proof of customer purchase (copy of customer's check, credit card receipt or lease contract and documentation) submitted with the Final As-Built packet.

7. Identification of other incentive(s) applied for or obtained that was subtracted from Total Installed System Cost on Line D6. Please identify the agency, program and dollar amount of each incentive: _____
   _____

8. Maximum allowable incentive (Multiply Line D6 by 30%): $_____

9. Final incentive amount requested (Input the lesser of Line D4 or D8): $_____

E: WARRANTY INFORMATION

1. Power only Equipment: _____ Years 2. Installation: _____ Years 3. Parts and Labor: _____Years

3. CHP Equipment: _____ Years 2. Installation: _____ Years 3. Parts and Labor: _____Years

An all-inclusive 5-year warranty is required for all systems Installed through *New Jersey's Clean Energy Program*. A copy of the warranty must be submitted.