



2009 PAY FOR PERFORMANCE PROGRAM COMBINED HEAT & POWER APPLICATION PACKAGE

Commercial & Industrial Market Manager Contact Information:

TRC Energy Services
Pay for Performance (CHP)
900 Route 9 North, Suite 104
Woodbridge, NJ 07095

Phone: (732) 855-0033

This Pre-Installation Application Form includes the Requirements, Instructions and Terms and Conditions for Combined Heat & Power projects eligible under the Pay for Performance Program. Before completing the forms and the related technical worksheets, please carefully read all of the information associated with A) Incentive Qualification Requirements, B) Instructions for Completing the Incentive Forms, and C) Important Terms and Conditions beginning on the following page.

A. INCENTIVE QUALIFICATION REQUIREMENTS:

Incentives will be awarded on a case by case basis. The Office of Clean Energy has the right to change/modify or discontinue the program without notice. The program will cease when commitments exhaust allocated funding.

1. The Applicant must be participating in the Pay for Performance Program or be certified as an ENERGY STAR Building. In cases where the project facility is not eligible for the ENERGY STAR Building designation, the LEED EB approach will be used to determine eligibility
2. The system must be installed in New Jersey. The applicant must be contributors to the Societal Benefits Charge fund. Only CHP equipment installed on the customer side of the meter is eligible. Equipment must be sized to serve all or a portion of the electrical load at the customer site. The above described generating system is sized to meet the customer's electrical loads (a) for demand-metered customers – no more than 100% of historical annual consumption or peak demand; b) for non-demand metered customers – no more than 125% of historical annual consumption.
3. System must be installed in accordance with requirements specified in New Jersey's Clean Energy Program Technical Worksheets for that type of equipment (i.e., gas micro turbines, gas engines, gas turbines, heat recovery equipment, or fuel cells), and it must come with owner's manuals and warranty documentation.
4. New installations with new equipment are eligible for Incentives; expansions of an existing facility with new equipment are also eligible for incentives. However only the incremental expansion would be eligible for the incentive.
5. Heat recovery or other mechanical energy recovery equipment used to generate electricity is eligible.
6. The system must achieve annual system efficiency of at least 60%, based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.
7. System warranty must be all-inclusive for at least 5 years, or a five year service contract (with the exception of fuel cell stacks, for which warranties against normal decline in output are not required). The cost of five year warranty may be considered as part of the cost of the project.
8. Incentives will not be processed without a Federal Tax Identification number, Proof of Purchase (receipt), and authorized signatures from the Applicant and Installer.
9. Projects that have met the minimum qualification requirements described above will be evaluated for funding according to the following criteria:
 - System efficiency
 - Environmental performance
 - Economic viability
 - Projected system startup date
 - Annual system utilization
 - General programmatic goals
 - Project clarity

Also considered:

- Local marginal pricing, as determined by the PJM interchange for the electric service area in which the project is located
- Islanding capability
- Smart Growth
- Emergency Management Center

B. INSTRUCTIONS FOR COMPLETING THE INCENTIVE FORM:

1. Complete all of Sections A through E of the Pre-Installation Application Form, all sections of the Technical worksheets, and a detailed feasibility analysis. All information is necessary for processing applications and incentives. Illegible or incomplete Application Forms and/or Technical Worksheets will be returned to the Applicant.
2. Mail completed Pre-Installation Application Form, appropriate Technical Worksheets, and a detailed feasibility analysis to the Commercial/Industrial Market Manager (see "Contact Information for address). Retain a copy for your files.
3. Once your Pre-Installation Application Form has been reviewed and approved, the Market Manager will send you a conditional commitment letter. To be eligible to receive a program incentive, you must receive this incentive conditional commitment letter from the Market Manager prior to equipment installation. You will also be sent a Final Application form to be submitted after the installation is completed.
4. Applicant must purchase a qualifying system and have it installed according to Program Installation Requirements within 18 months of the application approval date. Any changes between the initially proposed system and the installed system must be fully documented and are subject to Office of Clean Energy and the Market Manager's approval.
5. After the approved system is installed, the Applicant (or Installation Contractor) must submit the following to the Market Manager: a completed Final Incentive Application form; proof of purchase; proof of warranty; completed W9 Taxpayer ID and certification form; a copy of the Electrical Code Inspection Certificate; and a completed Interconnection Application.
6. After the installation is completed and all necessary inspections are performed, the incentive will be processed by the Market Manager.

C. IMPORTANT TERMS AND CONDITIONS:

1. To receive an incentive, Applicant must agree to an inspection by the Market Manager, a Market Manager representative, or a Market Manager-designated contractor. The applicant must also agree to allow the Market Manager to monitor the facility's energy usage to verify savings i.e., install metering.
2. The New Jersey Board of Public Utilities Office of Clean Energy reserves the right to modify or withdraw this program. Program procedures and incentive levels are subject to change or cancellation without notice. Approved projects will be honored under the terms stated in the conditional commitment letter.
3. Installation must comply with the host utility's Interconnection Requirements, which are available from the respective electric utility. These include Operation/Disconnection Procedures, Liability/Indemnity and Insurance Requirements according to the size of the project.
4. All required permits must be properly obtained and posted.
5. For information on Net Metering, please contact your electric utility.
6. Incentives are intended to enhance the affordability of clean energy generation systems. Systems should be installed according to manufacturer's instructions. For systems installed inconsistent with such requirements, the Rated System Output may be de-rated.
7. Equipment must be new, commercially available and permanently installed. The following are **not eligible** for incentives: portable and emergency backup power systems; used, refurbished, temporary, pilot, or demonstration equipment; systems that use diesel fuel, other types of oil or coal for continuous operation. Incentives for renewable fueled CHP projects are currently being developed. This application will be revised when the incentive levels are finalized.

Pay for Performance – Combined Heat & Power Pre-Installation Application Form

A. CUSTOMER INFORMATION:

Electric Utility: Atlantic City Electric Jersey Central Power & Light PSE&G Rockland Electric Company
Gas Utility: Elizabethtown Gas New Jersey Natural Gas PSE&G South Jersey Gas

Electric Utility Account Number: _____ Gas Utility Account Number: _____

Federal Tax I.D. Number: _____

First Name: _____ Last Name: _____

Company Name (if applicable): _____

Daytime Phone Number: _____ Email: _____

Installation Address: _____

City: _____ State: _____ Zip Code: _____

Mailing Address (if different from above): _____

City: _____ State: _____ Zip Code: _____

Will the Combined Heat and Power Project be used as an Emergency Management Facility? (Please check one):

Yes No (If yes, please provide appropriate documentation.)

B. INCENTIVE RECIPIENT - If Incentive check is to be issued to a company other than above, issue Incentive check to:

First Name: _____ Last Name: _____

Company Name (if applicable): _____

Daytime Phone Number: _____ Email: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Federal Tax I.D. Number: _____

Customer Signature: _____

C. CONTRACTOR/INSTALLER/DESIGN PROFESSIONAL - All fields must be completed:

First Name: _____ Last Name: _____

Company Name (if applicable): _____

Daytime Phone Number: _____ Email: _____

Address: _____

City: _____ State: _____ Zip Code: _____

D. EQUIPMENT INFORMATION:

Equipment Type:

Gas Microturbines Gas Engines Gas Turbines Heat Recovery Equipment Fuel Cells

Manufacturer: _____ Model: _____

Installed Capacity (in kW, as calculated in the Technical Worksheets): _____

E. CUSTOMER AND INSTALLER INFORMATION:

The undersigned warrants, certifies and represents that as part of the design study requirement; 1) the information provided in this entire application is true and correct to the best of my knowledge; 2) the Installer/Contractor will explain and provide manuals related to the system operation and maintenance to the customer (Applicant); and 3) the installation will meet all of New Jersey's Clean Energy Program requirements.

Customer (Applicant)

Contractor/Installer

Signature: _____ Signature: _____

Print Name: _____ Print Name: _____

Date: _____ Date: _____

Pay for Performance – Combined Heat & Power

Technical Worksheets for Combined Heat and Power (CHP) Equipment

Before completing the attached New Jersey's Clean Energy Program Technical Worksheets for Combined Heat and Power, please carefully read all of the information in Sections A, B and C below.

A. INSTALLATION REQUIREMENTS:

Equipment installation must meet the following requirements in order to qualify for payment under the provisions of New Jersey's Clean Energy Program such as:

1. A minimum overall system efficiency rating of 60% based on total energy input and total energy output.
2. An expected completion date. Due to program funding limitations, the expected completion date will be used as an award criteria. The Applicant should submit documentation from manufacturers and contractors which state the expected equipment delivery and installation dates.
3. Equipment must be new, commercially available and permanently installed. The following are **not eligible** for incentives: portable and emergency backup power systems; used, refurbished, temporary, pilot, or demonstration equipment; systems that use diesel fuel, other types of oil or coal for continuous operation.
4. The installation must comply with manufacturer's instructions.
5. The installation must comply with the interconnection and protection requirements of the local electric distribution company.
6. The installation must comply with provisions of these standards, as appropriate: NFPA 853 – Stationary Fuel Cell, and all codes governing the installation of Combined Heat and Power equipment; Power Plants, IEEE 519 – Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems; ANSI Z21.83-1998 Fuel Cell Power Plants, and input and output protection functions should be in compliance with ANSI C37.2 Device Function Number specifications.
7. 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 & DC overcurrent protection or equivalent
 - Operating status indication
 - Remote control and data acquisition capable
 - Electric load-following capable
8. 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.
9. 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.)
10. All wiring splices must be contained in UL-approved workboxes.
11. Operating instructions must be posted on or near the system, or on file with facilities operation and maintenance documents.

Proposed changes to the requirements will be considered, but they must be documented by the Applicant or Installation Contractor and approved by the Office of Clean Energy. These requirements are not all-encompassing and are intended only to address certain minimum safety and efficiency standards.

B. 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. All required inspections must be performed (i.e., Electrical/NEC, Local Building Codes Enforcement Office, etc.).

In order to ensure compliance with provisions of the NEC, an inspection by a state-licensed electrical inspector is mandatory.

C. INSTRUCTIONS:

The information below must be supplied in the detailed feasibility analysis. Provide a brief narrative describing the facility and the project including (but not limited to) the following.

System Type and Mode of Operation:

Grid-connected Operating mode (parallel/capable of synchronizing with the electric grid; capable of automatically reducing load to prevent backfeeding the meter)

1. Grid-connected/grid-independent operating mode (parallel/capable of synchronizing with the electric grid and capable of switching automatically to independent, load-following operation when the grid is unavailable; automatic operation and synchronization of multiple power plants connected in parallel)
2. Stand-alone load-following operation (system confined to an independent circuit, no utility backup)
3. Battery interactive capabilities, if applicable

Continued next page

Pay for Performance – Combined Heat & Power

Technical Worksheets for Combined Heat and Power (CHP) Equipment

C. INSTRUCTIONS (continued from previous page)

System Information:

1. Complete Form #1 in its entirety.
2. The type and rating of the prime mover and an energy balance around the prime mover. The energy balance must be applied to a schematic of the system showing all major components, including the uses for the recovered heat. Annual totals for each energy input/output must be shown along with maximum, minimum, and average instantaneous values. Temperatures for each waste heat transfer fluid and sink must also be indicated.
3. Fuel conversion efficiency (FCE) for the prime movers must be provided. 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.
4. The description of the proposed system must include a floor plan indicating equipment location and tie-in to existing building systems. Any structural modifications must be included in the capital cost of the system. This document must indicate the location of the Combined Heat and Power system, batteries (if any), lockable disconnect switch (unless otherwise approved by the electric utility, the disconnect switch shall be installed at the electric utility meter location), and point of connection with the utility system. The installation address, current account number at that address (gas and electric), and the installer's name and telephone number must also be included on the site map.
5. The pressure and availability of gas must be described in the study.
6. An operational sequence must be included that specifies the control system to be used along with a discussion of its integration with other on-site controls systems and who will have the responsibility for system operation.
7. A construction schedule that includes engineering, permitting, construction, start-up and commissioning must be provided.

Economic Evaluation: Complete Form 3 and Form 3a in their entirety

CHP System Economic Evaluation Requirements:

Simple payback, 10 year cash flow analyses, and IRR analysis are required for purposes of this application. Although the format of these analyses is at the discretion of the applicant, the following inputs must be considered and shown within these analyses:

1. Total CHP system capital cost (from Form 3)
2. CHP system operating hours, load factor, and availability factor
3. Total service and maintenance costs (from Form 3a)
4. CHP system heat rate/ fuel consumption
5. Efficiency of current boiler plant, chiller plant, etc. for which recovered waste heat will supplement.
6. Clearly state energy savings or increased use of energy; and the demand savings. The savings, or the increase, should be stated in terms of KW, kWh and in MMBtu.
7. Fuel cost – commodity and delivery
8. Offset electricity quantity and value – customer charge, demand charge, commodity charge, TOU where applicable, any unavoidable charges
9. Offset thermal energy quantity and value – commodity and delivery
10. Changes to tariffs due to CHP, including supplemental electricity tariffs, standby rates and exit fees
11. Fuel and electricity escalation rates for cash flow analysis
12. Financing options and assumptions, such as the discount rate and interest rate for cash flow analysis
13. Any additional costs or credits, including incentives, the value of reliability, emission credits, HVAC equipment offsets, etc.

Tariff Impacts and Interconnections:

1. In addition to inclusion in the economic analysis described above, a detailed description of the relationship between the proposed CHP facility and the customer's existing energy tariffs must be included. Contract dates and dates of potential tariff rule changes must be included. In the case where such future changes would significantly impact the economics of the project, sensitivity analysis must be presented assuming the potential tariff or contract changes occurred.
2. Site-specific grid interconnection issues and costs must be discussed. A brief, clear plan for if and how the system will be properly interconnected to the grid and/or natural gas pipelines must be presented.

Permitting:

1. A brief description of the necessary environmental and building permits or certificates that the customer needs to obtain must be provided. The permit determination should be based on a detailed emissions inventory developed from the hourly spreadsheet based model. A schedule of realistic permit receipt dates must be included in the schedule described above.

System Reliability and Availability:

1. The reliability and availability of the CHP system must be quantified (e.g. number of hours the system would be available at less than full capacity).

Supporting Documentation Should Include the Following:

1. Self-generation and waste heat recovery equipment specifications
2. New and existing facility equipment (both thermal and electric) annual operating schedules
3. At least twelve months of the most recent electric bill(s) for the facility served by the CHP system
4. At least twelve months of the most recent bills for natural gas, fuel oil and/or other fuels used in the facility served by the CHP system.

If you plan to use an absorption chiller to offset cooling load, provide cooling load calculations.

Pay for Performance – Combined Heat & Power

Technical Worksheets for Combined Heat and Power (CHP) Equipment

With the help of your installation contractor, fully complete the technical worksheets for combined heat and power equipment, as well as New Jersey's Clean Energy Program Pre-installation Application form. *Emission Standards will be considered

FORM 1: Proposed CHP System Performance

Proposed System overview (Annual)

Prime Mover Type		
Energy Input	(MMBtu)	
Electric Output	(kWh)	
	(MMBtu)	
Recoverable Thermal Output	(MMBtu)	
Utilized Thermal Output ¹	(MMBtu)	
Annual System Efficiency ²	(%)	

1 kWh =
0.003412
MMBtu

Rated System Information

Prime Mover Model Info		
Energy Input	(MMBtu)	
Rated Electric Output	(kW)	
	(MMBtu/h)	
Total Thermal Output	(MMBtu/h)	
Recoverable Thermal Output	(MMBtu/h)	
Fuel Conversion Efficiency ³	(%)	

1 - Heat used from the CHP systems for the purpose of heating and cooling

2 - Annual System efficiency = (Electric output + Utilized Thermal Output)/Energy Input

3 - Fuel Conversion Efficiency = (Rated Electric output + Recoverable Thermal Output)/Energy Input

Proposed System Overview

Month	Anticipated operating hours	Input Fuel (MMBtu)	Output Electricity (MMBtu)	Recoverable Thermal output (MMBtu)	Utilized Thermal output (MMBtu)	Electric Efficiency (%)	Thermal Efficiency (%)	Annual Efficiency (%)
Jan								
Feb								
Mar								
Apr								
May								
Jun								
Jul								
Aug								
Sep								
Oct								
Nov								
Dec								
Total								

Breakdown of Recovered Thermal Output (Indicate in the detailed feasibility analysis the fuels that are being displaced and the respective equipment efficiency)

Month	Process Heating (MMBtu)	Process Cooling (MMBtu)	Space Heating (MMBtu)	Space Cooling (MMBtu)	Domestic Hot Water (MMBtu)	Other (MMBtu)	Total (MMBtu)
Jan							
Feb							
Mar							
Apr							
May							
Jun							
Jul							
Aug							
Sep							
Oct							
Nov							
Dec							
Total							

Unit Cost of Gas		
Unit Cost of Electricity		
Rate Schedule	Electricity	
	Gas	

Pay for Performance – Combined Heat & Power

Technical Worksheets for Combined Heat and Power (CHP) Equipment

With the help of your Installation Contractor, fully complete the Technical Worksheets for Combined Heat and Power Equipment, as well as New Jersey's Clean Energy Program Pre-Installation Application Form.

FORM 2: Air Emissions Data

This form reports anticipated annual emissions of the six (6) pollutants due to the CHP System. The first table should include vendor supplied data on the emissions from the prime mover to be installed. The second two sections will show what fraction of those new emissions is displacing current system emissions.

Yearly Grid Supplied Electricity (Pre-Installation) (MWh/year)	
Yearly CHP System Supplied Electricity (MWh/year)	
Yearly Grid Supplied Electricity (Post-Installation) (MWh/year)	

Vendor Supplied CHP System Emissions

NOx		lbs/MWh
SOx		lbs/MWh
PM-10		lbs/MWh
CO2		lbs/MWh
CO		lbs/MWh
VOC		lbs/MWh

Estimates of "Displaced" Emissions

The following two tables should be completed if data or information exists. By reporting on the emissions of the facility both before and after installation of the CHP system, the net impact of the new system can be estimated. If insufficient data exists, leave the tables blank. For systems greater than 2 MW, both tables must be completed prior to the release of the committed incentive.

Calculated Annual Boiler/Furnace Emissions (lbs)

	Pre-CHP Installation	Post Installation D	Difference
NOx			
SOx			
PM-10			
CO2			
CO			
VOC			

Annual Site Emissions (lbs)

	Pre-CHP Installation	Post Installation D	Difference
NOx			
SOx			
PM-10			
CO2			
CO			
VOC			

Pay for Performance – Combined Heat & Power

Technical Worksheets for Combined Heat and Power (CHP) Equipment

With the help of your Installation Contractor, fully complete the Technical Worksheets for Combined Heat and Power Equipment, as well as New Jersey's Clean Energy Program Pre-Installation Application Form.

FORM 3: CHP System Costs Table

Directions: Please enter all CHP system capital costs in the table below. Break out costs should add up to total CHP system turnkey cost. Turnkey line item costs should include any administrative and markup costs. Where a component or construction cost is not included in CHP project design enter "N/A." Where a component or construction cost is provided within another line item, please enter "included."

CHP System Component Cost	(\$)
Prime Mover	
Fuel Compressor	
Black Start Capability	
Generator	
Heat Recovery	
Cooling Tower or other Heat Dump	
Absorption Chiller	
Desiccant	
Controls	
Sound Attenuation	
Inlet Air Handling	
Vibration Isolation	
Emission Controls	

Design/Construction/Labor and Materials Cost	(\$)
Engineering	
Site Preparation	
Buildings	
Construction Labor	
Materials	
Exhaust Stack	
Electrical Tie-in	
Mechanical Tie-in	
Grid Interconnection Devices	
Permitting Fees	
Contingency	

Total CHP System Turnkey Cost	
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Pay for Performance – Combined Heat & Power

Technical Worksheets for Combined Heat and Power (CHP) Equipment

FORM 4: INCENTIVE REQUEST CALCULATION:

1. Total system rated net continuous output (from Form 1): _____ AC Watts.
2. Incentive Calculation (Calculate appropriate incentive based on System Rated Output).

Incentives: Incentives vary based on CHP technology, type, project size and total project cost. See Table 1 for qualifying technologies, and available incentives.

TABLE 1: CHP INCENTIVE PROGRAM TECHNOLOGY AND INCENTIVE LEVELS

Eligible Technology	Incentive (\$/Watt) (up to \$1.0 Million)	Maximum % of Project Cost	Minimum System Size
Level 1 <ul style="list-style-type: none"> • Fuel cells not fueled by Class I renewable fuel 	\$4.00/W	60%	None
Level 2 <ul style="list-style-type: none"> • Microturbines • Internal Combustion Engines • Combustion Turbines 	\$1.00/W	30%¹	None
Level 3 <ul style="list-style-type: none"> • Heat Recovery or Other Mechanical Recovery Electric Generation Equipment 	\$0.50/W	30%	None

1. The maximum % of project cost will go to 40% where a cooling application is used or included with the CHP system. Incentives for renewable fueled CHP projects are currently being developed. This application will be revised when the incentive levels are finalized

2. Requested Incentive (Enter the appropriate value using above table): \$ _____

Example:

- If a level 1 fuel cell, Incentive = (AC watts X \$4.00/watt)
- If a level 2 microturbine, Incentive = (AC watts X \$1.00/watt)
- If a level 3 heat recovery project, Incentive = (AC watts X \$0.50/watt)

3. Total Installed CHP System Turnkey Cost: \$ _____ (from Form 3 CHP System Cost Table), including 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, as well as proof of customer purchase (copy of customer's check, credit card receipt or lease contract) and documentation submitted with the Final Application Form.

4. Maximum allowable incentive (Multiply line 4 by 60% for level 1 systems or 30% for level 2 or level 3 systems. If the level 2 system includes a cooling application then multiply line 4 by 40%): \$ _____

5. Final incentive amount (Input the lesser of line 3 or 5, Funding shall be capped at \$1,000,000 per project): \$ _____

I hereby submit that all of the provided information is true to the best of my knowledge.

Customer Signature: _____ Application Number: _____

(Corresponding to Pre-Installation Application Form)

(Assigned by Market Manager)