

## Proposed Changes to NJCEP 2011 Budgets

The Office of Clean Energy, Honeywell and TRC are proposing the following changes to the Board approved 2011 NJCEP budgets:

1. Transfer \$445,000 from the CORE program budget to the Sustainable Jersey budget line: In 2010 the Board approved a budget of \$445,000 for Sustainable Jersey that was embedded in the budget for the Community Partners Initiative. In 2011 the Community Partners Initiative was terminated and the Board approved a separate budget of \$625,000 for Sustainable Jersey. Invoices for services provided by Sustainable Jersey in 2010 will be paid in 2011. However, the carry over from the 2010 Community Partners Initiative was inadvertently not transferred to the new budget line for Sustainable Jersey. Therefore, Staff is proposing to transfer \$445,000 to the Sustainable Jersey budget line to pay expenses for services provided in 2010 that will or have been invoiced in 2011. Staff is proposing to transfer the funds from the CORE program. The CORE program has been closed since 2008 and the funds are no longer required due to the cancellation of projects that previously received and rebate commitment.
2. Honeywell is proposing to transfer \$495,000 from the Rebate component of the REIP budget to the Rebate Processing, Inspections and Other Quality Control component of the REIP budget. The proposed increase in the processing fees is a result of the large increase in the quantity of new SRP applications that have been received and approved thus far with the expectation that this level of activity will continue into the last quarter of 2011. Project completions have also increased resulting in an increase in the number of onsite REC verifications (SRP inspections) and SREC referrals (issuance of NJ Certification #). The total REIP budget remains unchanged at \$41,612,455.10. The budget for "Rebate Processing, Inspections and Other Quality Control" is proposed to increase by \$495,000.00 from \$2,325,666.05 to \$2,820,666.05. The additional funds for processing applications are available as a result of REIP project cancellations.
3. TRC is proposing to transfer \$50,000 from the Rebates, Grants and Other Direct Incentives budget category to the Training and Technical Support budget category of the TEACH program. The TEACH program was closed to new applicants in 2010 and the 2011 budget is for completing projects that submitted applications in 2010. The number of professional development workshops and end of year meetings is expected to exceed the number estimated when budgets were developed in 2010. Sufficient funds remain in the Rebates, Grants and Other Direct Incentives budget category to meet anticipated expenses. The overall TEACH budget remains unchanged.

**From:** ee-bounces@njcleanenergy.com **On Behalf Of** Linda Wetzel  
**Sent:** Wednesday, July 20, 2011 11:44 AM  
**To:** ee@njcleanenergy.com; renewables@njcleanenergy.com  
**Subject:** NJCEP Fuel Cell Proposal

All:

As discussed at the July meeting of the EE Committee, OCE has been coordinating with TRC and others to develop incentives for certain fuel cells that do not utilize waste heat recovery. Attached please find TRC's proposal for a new incentive for fuel cells without heat recovery as well as a modification to the current incentive for fuel cells with heat recovery. Staff is requesting comments on the proposal prior to submitting it to the Board for its consideration.

Comments should be directed to Mike Winka, Director, Office of Clean Energy and are due by COB Friday July, 29, 2011. Comments should be submitted to:

[publiccomments@njcleanenergy.com](mailto:publiccomments@njcleanenergy.com)

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# Fuel Cell Incentive Proposal: 07-18-2011

## Background

The purpose of the following is to propose incentives for fuel cells that do not utilize waste heat recovery and to propose changes to the existing incentives for fuel cells that operate as a traditional CHP system, i.e., with heat recovery. New Jersey’s Clean Energy Program (NJCEP) was approached by a solid oxide fuel cell (SOFC) manufacturer requesting a reevaluation of the current incentives for fuel cell systems. Based on the current 60% combined efficiency threshold (electric & gas) for CHP systems, a fuel cell producing only electricity would not meet the current program requirement. In addition, fuel cells without waste heat utilization do not meet the definition of a CHP system and therefore do not meet the current program requirements. Currently, fuel cells either operating with waste heat recovery as a CHP unit or without waste heat recovery as a generator cannot net meter under the current net metering statutes (NJSA 48:3) and regulations (NJAC 14:8). In addition, while the NJBPU interconnection requirements as set forth at NJAC 14:8 may be applicable to fuel cell CHP and generators it would be up to the individual Electric Distribution Company (EDC) as well as the Municipal Electric Utilities and the Sussex Rural Electric Coop to develop specific interconnection requirements.

A number of potential methods were presented to incorporate these types of fuel cells into the program. However, a more in-depth analysis was performed to first assure the technology is well suited to meet the goals of the NJCEP. TRC consulted not only its internal technical resources but the experts at the U.S. Department of Energy, U.S. Environmental Protection Agency, and the Rutgers Center for Advanced Energy Systems to obtain additional information relative to these fuel cell systems.

## Points of Discussion

The major concern of fuel cell installations is the maintenance costs, specifically regarding stack replacement which can represent up to 80% of the installed system cost. Stack replacement occurs approximately every 4-8 years<sup>1</sup>, but has been known to occur in as little as 3 years. This can result in a large investment for the customer a few years down the road. For this reason, a five year service contract (which covers stack replacement) or an all-inclusive five-year system warranty should be required. This will help in achieving the anticipated savings by the NJCEP.

In a meeting with Rutgers Center for Advanced Energy Systems, a major concern regarding stack replacement was discussed. For them, this is the single most important issue to consider and evaluate when investing in fuel cells. The benefits of these types of systems are the relative ease of modular installation, silent operation and improved emissions over micro turbine and reciprocating prime movers.

The table below includes a summary of fuel cell incentives offered by New York and California.

## Other Utility Incentive Offerings

State	System Type	Incentive Levels	Caps	Min Elec Efficiency	Notes
CA	Non-Renewable	0-1MW.....\$2.50/watt >1MW–2MW.....\$1.25/watt	Max system size 5MW; Max incentive size 3MW	40%	Categorized under Renewable

<sup>1</sup> Information derived from a study done by Energy and Environmental Analysis, Inc for the Environmental Protection Agency’s Combined Heat and Power Partnership Program.

	Fuel Cells	>2MW– 3MW...\$0.625/watt			Energy Program
NY	Fuel Cells	>25kW+ .....\$1.00/watt Bonus #1 \$0.50/watt for select sectors. Bonus #2 \$0.15/kWh for high performance in operation	\$200k base incentive (#1) \$100k for bonus (#2) \$300k/year for up to 3 years for bonus Max \$1 Million	n/a	Categorized under Renewable Portfolio Standards

### Emissions Profile

The following table presents emission characteristics for four different fuel cell technologies<sup>2</sup>. Further research may need to be done to verify accuracy of the values presented below:

Emissions Analysis <sup>24</sup>	System 1	System 2	System 3	System 4	System 5	System 6
Electricity Capacity (kW)	200	10	200	300	1200	100
Electrical Efficiency (HHV)	33%	30%	35%	43%	43%	43%
Fuel Cell Type	PAFC	PEM	PEM	MCFC	MCFC	SOFC
Emissions						
NOx, (lb/MWh)	0.035	0.06	0.06	0.02	0.02	0.05
CO, (lb/MWh)	0.042	0.07	0.07	0.10	0.10	0.04
VOC, (lb/MWh)	0.012	0.01	0.01	0.01	0.01	0.01
CO2, (lb/MWh)	0.035	0.06	0.06	0.02	0.02	0.05

\* Electric only, for typical systems available or under development in 2007. Estimates are based on fuel cell system developers' goals and prototype characteristics. All estimates are for emissions without after-treatment and are adjusted to 15 percent O<sub>2</sub>.  
Source: Energy Nexus Group

In a meeting with Rutgers Center for Advanced Energy Systems, they did not feel that emissions were of any concern for fuel cell technology as long as natural gas was the source of fuel. Landfill gas, on the other hand, was seen as a “dirtier” fuel source, which must undergo a number of cleaning procedures before being used in a fuel cell. In particular, a number of fuel cell types are expected to offer significant emissions reductions over reciprocating engines and micro turbines.

### Current NJCEP Offerings

Fuel cell incentives are currently available under the Combined Heat and Power (CHP)/Pay for Performance (P4P) program but only for CHP applications. Fuel cells must be installed with waste heat recovery capability, and must demonstrate a minimum combined electric and thermal efficiency of 60%. Existing incentives and incentive caps are below.

Incentive: \$4.00 per watt

Cap: 60% of total project cost or \$1million (whichever is less)

This incentive for fuel cell CHP, as well as the full range of CHP incentives, was set when the natural gas market was at a high point. Given the changing economics for natural gas the OCE is in the process of right sizing the CHP incentives to match the significant reduction in natural gas price over the last couple of years.

<sup>2</sup> Information derived from a study done by Energy and Environmental Analysis, Inc for the Environmental Protection Agency's Combined Heat and Power Partnership Program.

### Potential Proposed NJCEP Offerings

TRC is proposing to offer a new stand-alone incentive for fuel cells without waste heat utilization and to lower the current incentives for fuel cells that utilize waste heat recovery. The proposed fuel cell incentives will remain under the Pay-for-Performance program consistent with the current CHP program. The proposed changes to the existing incentives for fuel cell CHP systems are based on market research and comparison with other energy efficiency programs offering CHP incentives. The proposed incentive levels are shown in the following table:

<b>Application Type</b>	<b>Minimum Efficiency</b>	<b>Incentive</b>	<b>Cap</b>
Fuel Cell w/ waste heat utilization	60% (combined electric and thermal)	\$2.00/watt	60% of total project cost or \$1million (lesser of)
Fuel Cell	45% (electric only)	\$1.00/watt	60% of total project cost or \$1million (lesser of)

Average installed cost of fuel cells range from \$5-\$9/watt<sup>3</sup>. Incentives of \$2.00/watt would provide for 22-40% of installed cost, while \$1.00 would provide for 11-20% of installed cost. It is important to note that fuel cells installed in a cogeneration application will likely have a significantly higher installed cost than fuel cells installed strictly for distributed generation. The cost difference is due to the avoided material, labor and engineering associated with connecting to the existing facilities heating and/or cooling systems (air, water, air/water).

Incentives for stand-alone fuel cells shall only be available for fuel cells powered by natural gas. Consistent with the current policy for CHP projects, no renewable fuel option shall be made available at this time for fuel cells under the Commercial and Industrial EE Program. However, renewably powered fuel cells are eligible for incentives under the Renewable Energy Incentive Program (REIP) contingent on meeting the definition of a Class I renewable energy system. The EE stand-alone Fuel Cell incentives shall maintain existing P4P pre-requisites. All other CHP application/incentive levels for other technology types (i.e. micro turbine, engine, etc.) within the P4P program will remain unchanged at this time. However, staff has directed TRC to evaluate other CHP incentive/financing options for future inclusion in the C&I EE programs.

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<sup>3</sup> Information derived from a study done by Energy and Environmental Analysis, Inc for the Environmental Protection Agency's Combined Heat and Power Partnership Program. Supplemental opinion provided by Rutgers Center for Advanced Energy Systems.