

NYSERDA's Approach to the Promotion of Distributed Generation and Combined Heat & Power

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NYSERDA's Overall Mission

- Public Benefit Corporation and a Component Unit of the State of New York
- Goals:
 - Promote Energy Efficiency
 - Encourage Economic Development
 - Expand the Use of New York State's Indigenous and Renewable Energy Resources
 - Reduce or Mitigate Adverse Environmental Effects Associated with Energy Production and Use

NYSERDA DG/CHP Strategy

- Implement a program that supports:
 - Feasibility analyses to evaluate project potential and viability
 - Develop and demonstrate enabling technologies
 - Product development, testing, and evaluation
 - Demonstrate the effectiveness of DG/CHP applications

DG/CHP Assessment Activities

The following projects are co-funded by DOE:

Characterizing New York DG/CHP Market and Benefits:

- **Summarize current status of DG/CHP in New York**
- **Provide review of market impediments**
- **Educate community and develop policy strategy for DG/CHP market acceptance**
- **Funding NYSERDA \$100,000 – total cost \$315,000 (unsolicited)**

DG/CHP Assessment Activities

Promoting DG/CHP in New York's Industrial Sector:

- Review all siting and permitting processes
- Develop a streamlined process
- Integrate utility Districts' available Geographic Information Systems (GIS) information to identify areas that would benefit most from DG/CHP
- Evaluate impact of power quality interruptions and how DG/CHP could be a cost-effective solution
- Funding NYSERDA \$120,000 – total cost \$437,000 (unsolicited)

DG/CHP Assessment Activities

Assessment of Operational Reliability and availability of industrial on-site generation:

- **Develop a database on operational reliability and availability for industrial on-site generation systems to allow DG managers to better evaluate their unit**
- **Funding NYSERDA \$30,000 – total cost \$350,000 (unsolicited)**

DG/CHP Assessment Activities

The following project is co-funded by U.S. EPA and other sponsors

Environmental performance of distributed generation – balancing energy and environmental objectives:

- **Evaluate the environmental implications of DG**
- **Provide technical input for the State Energy Plan**
- **Center for Clean Air Policy is conducting the study**
- **Funding NYSERDA \$14,900 – total cost for work done in New York \$35,130 (unsolicited)**

DG/CHP Assessment Activities

This project is solely funded by NYSERDA

Integrating assessment of CHP in New York State:

- **Evaluate the potential for CHP in New York State**
 - **Evaluate possibilities for repowering existing boilers in the more than 500 industrial, commercial, and institutional facilities**

Funding NYSERDA \$80,000 – total cost \$80,000 NYSERDA solicitation PON509

Applications, Demonstrations and Evaluation

Eight projects involving use of anaerobic digestion of farm manure to produce energy:

- **Prime mover technology either microturbines or reciprocating engines**
- **Funding NYSERDA \$2,000,000 – total cost \$5,000,000**

Applications, Demonstrations, and Evaluation

- **Aggregating Distributed Generators**
 - Demonstrate the aggregation of backup generators by adding controls to make them immediately dispatchable from a single control point to provide spinning reserve, interruptible load, and peak power to the utility grid
 - Evolved into a Joint NYSERDA/DOE effort
 - Culminates in a 30 MW demonstration

Contractor: Electrotek Concepts Inc.

Base Year Funding: NYSERDA \$250,000

DOE \$110,000 – total cost \$583,265

Applications, Demonstrations and Evaluation

- **Numerous microturbine demonstration and evaluation projects**
 - **Capstone, Honeywell and Ingersoll-Rand**



Applications, Demonstrations and Evaluation

- **PEM Fuel Cell Demonstration**
 - **3 Phase project to build, test, evaluate and demonstrate 80 Plug Power 7 kW fuel cells**
 - **Deploy units at publicly-owned and accessible facilities across the state**
 - **Verify the clean, environmentally friendly nature of PEM fuel cells and garner public support for their early introduction**
 - **Accelerate wide scale commercialization**

Applications, Demonstrations and Evaluation

- **PEM Fuel Cell Demonstration (cont'd)**
 - **Phase 1 - Laboratory evaluation of 24 pre-production prototypes (Completed 1999)**
 - **Phase 2 – Initial field evaluation of 6 pre-production prototype units (Completed 2000)**
 - **Phase 3 – Demonstration of 50 advanced design units (commenced in November 2000 and scheduled to be complete December 2001)**

Equipment Design, Development & Testing

Phase 2



Phase 3



plug power
FROM CLEAN ENERGY
Energy for a Clean Earth...

Applications, Demonstrations and Evaluation

Static Inverter Type Testing

- **Develop and demonstrate a procedure for type and verification testing of static inverters for use in utility grid interconnections**
 - **Will have applications for numerous emerging technologies which utilize static inverters such as fuel cells, photovoltaics, microturbines and wind power**

Contractors - Plug Power /UL

**Funding NYSERDA \$28,168 – total cost \$116,586
(solicitation 493-99)**



NYSERDA's DG/CHP Demonstration Projects

- Showcase successful DG/CHP applications in New York State
- Identify implementation hurdles and illustrate real world examples of how they can be overcome
- Collect and report performance data on a wide variety of DG/CHP installations
- Reduce electric grid demand
- Reduce the risk of installing good innovative or underutilized DG/CHP applications



DG/CHP Product Development/ Demonstration Projects

- Two solicitations Fall of 2000 and Spring of 2001 (latter included DG/CHP demonstrations plus R&D/product development)
- NYSERDA has committed a total of approximately \$21 Million to 50 CHP projects in Industrial, Institutional, Commercial, and Residential Sectors plus \$3.6 for 17 R&D projects
- Total installed electricity generating capacity will be approximately 45 MW



PEM Fuel Cell

- National Fuel Gas
- Plug Power 5kW Fuel Cells at two residences in their service area – will operate for 1 year
- Identify the process and issues surrounding installation of fuel cells for residential applications
 - Evaluate initial planning, site selection and preparation, permits, grid interconnection, and operation and maintenance from a gas utility perspective
- “Best Practices” Guide for installation, operation and maintenance of fuel cells will be produced by contractor
- Status: Units have shipped and start up will be completed by mid-December 2001



Geothermal Heat Pump/Microturbine

- RJ Dooley & Associates
- Office space, 2 restaurants, retail space & day spa
- Capstone 60 kW Microturbine with 180 Ton Geothermal Heat Pump
- Heat recovery from microturbine added to heat pump loop for space heating and DHW
- Estimated 48% COP efficiency improvement in HVAC system during heating operation
- Funding: NYSERDA: \$448,000; Total=\$896,000



DG/CHP Demonstrations

- Round Three (Fall/Winter 2001/2002)
- \$10 Million in funding assistance, up to:
- \$100,000 for feasibility studies
- \$500,000 for product development
- \$1,000,000 for demonstrations
 - Expected December 2001 release
 - Proposals will most likely be due mid-to-late February 2002

SUMMARY

- New York State Holds Significant Potential for DG and CHP
- Currently Active NYSERDA Projects Demonstrate Excellent Potential Across All End-Use Sectors
- Grid Interconnection, Siting & Permitting, and Natural Gas Price & Availability are the Key Hurdles
- \$10 Million in cost-sharing available this winter for demonstration projects and product development