

NYSERDA
Acquisition of Stationary Fuel Cells
September 2007



NYSERDA

New York State Energy Research and Development Authority

- **A Public Benefit Corp established in 1975 by State Legislature.**
- **Mission: To identify solutions to State's energy challenges in ways that benefit the State's economy and environment.**
- **Forge public/private partnerships with businesses, municipalities, residents, and other energy stakeholders to accomplish this goal.**

NYSERDA

NYSERDA provides Co-Funding to Eligible Recipients to help:

- **Evaluate Options for Energy Efficiency Improvements.**
- **Purchase and Install Premium-Efficiency Equipment.**
- **Invent New Products to Grow NYS Manufacturing Jobs.**
- **Pioneer Process Changes to Improve Manufacturing Process.**
- **Conduct Technology Transfer to Spur Marketplace.**

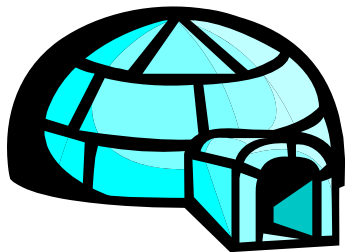
Modernization of cooling for food preservation

THEN:

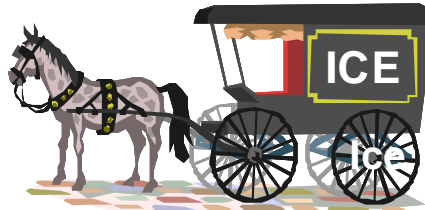
Ice produced at remote location

+

transported long distances to your home



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NOW:

Cooling produced by appliance at home



Modernization of cooling for food preservation

THEN:

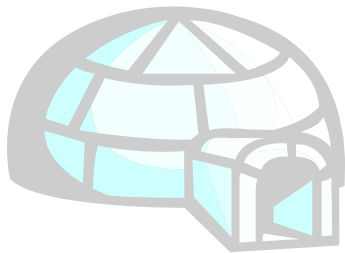
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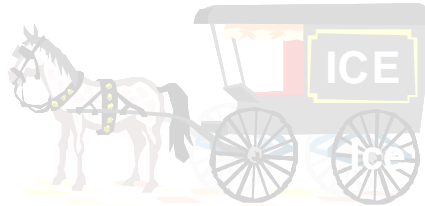
transported long distances to your home

NOW:

Cooling produced by appliance at home



+



Modernization of electricity infrastructure

NOW:

Electricity produced at remote location

+

transported long distances to your home

WHEN:

Electricity produced by appliance at home



+



Program:	R&D Demo Program	Mini-Fleet: Demonstrate, Improve Design, -then- Deploy	E-CIPP: Commercial Institutional Performance Program	Residential Energy Efficiency Affordability Program	RPS CST Fuel Cells and RPS CST ADG	Total
Historic To Date	\$55 Million 95 projects 48 operating @ 26 MW Full-build @ 130 MW		\$16 Million 18 projects Full-build @ 63 MW			\$71 Million 113 projects Full-build @ 193 MW
Future thru 12/31/09	\$22 Million Full-build @ 53 MW	\$5 Million Full-build @ 12 MW	\$11 Million Full-build @ 45 MW	\$5 Million Full-build @ 5 MW	\$22 Million Full-build @ 7 MW	\$65 Million Full-build @ 122 MW
Total Historic thru 12/31/09	\$77 Million Full-build @ 183 MW	\$5 Million Full-build @ 12 MW	\$27 Million Full-build @ 108 MW	\$5 Million Full-build @ 5 MW	\$22 Million Full-build @ 7 MW	\$136 Million Full-build @ 315 MW

Additionally, \$22 million of NYSERDA funding has been invested in nearly 70 projects for power system technologies development since 2000, and NYSERDA has funded and continues to fund numerous projects for DG/CHP Feasibility Studies and Technology Transfer.

Upcoming RPS CST Fuel Cell Program

- First-come/first-served funding format.
- \$11.2 million through 2009.
- Capacity payment when equipment installed/commissioned.
- Performance payments at end of years 1, 2, and 3.
- Stationary power: small and large fuel cells.
- “Mature” fuel cells, ANSI certification, warrantee.
- PON 1150, anticipate available in October 2007.

http://chp.nyserda.org

DG/CHP Integrated Data System

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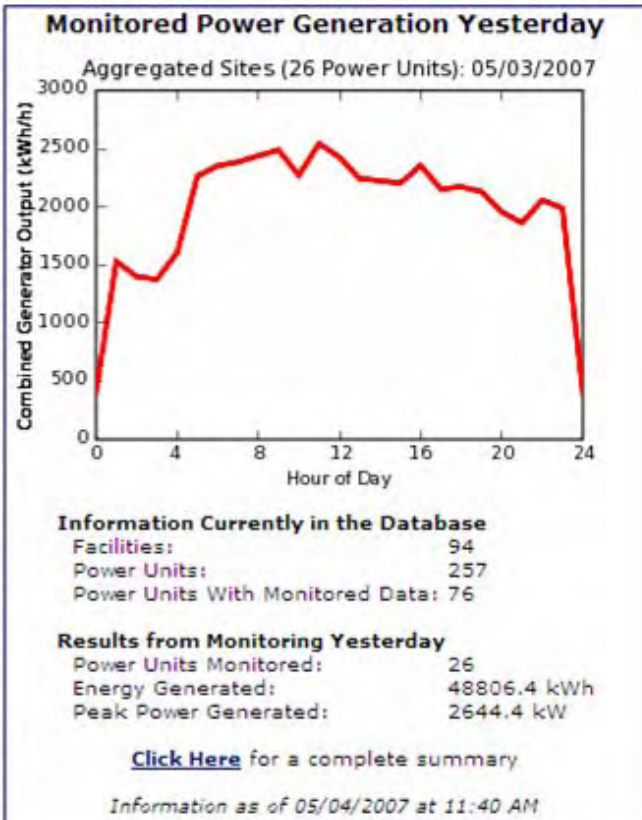
Welcome to the NYSERDA web-based DG/CHP data system. This system includes monitored performance data and operational statistics for NYSERDA's Distributed Generation (DG)/Combined Heat and Power (CHP) demonstration projects.

The integrated database includes the following:

- Monitored Hourly Performance Data
- Operational Reliability and Availability Data
- Characteristics of Each Facility and its Equipment

DG/CHP systems offer the potential to reduce operating costs for end users as well as to improve reliability of the electric distribution and transmission system. NYSERDA's objective is to accelerate the deployment of these technologies in the market to create benefits for the state of New York. To accelerate market acceptance, NYSERDA is supporting efforts to demonstrated DG/CHP systems that show the economic, technical, and environmental benefits of these systems in a variety of commercial, institutional, and industrial applications. This database provides access to the measured performance and reliability data collected on NYSERDA's demonstration sites.

The Monitored Hourly Performance Data portion of the database allows users to view, plot, analyze, and compare performance data from one or several different DG/CHP sites in the NYSERDA



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DG/CHP Integrated Data System

[▶ Home](#)
[▶ Facilities](#)
[▶ Reports](#)
[▶ Links](#)
[▶ Help](#)
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The following facilities are currently in the database. Click on a column heading to re-sort by that column. Click on a facility name to view details about that facility. [Click Here](#) to see a map showing all of the facilities.

<u>Facility</u>	<u>Category</u>	<u>Developer</u>	<u>Primary Fuel</u>	<u>Units</u>	<u>Installed Capacity</u>	<u>Commission</u>	<u>Monitoring</u>
10 West 66th Street Corp. New York, NY	Multi-Family Residence	DSM Engineering	Natural Gas	1	70 kW	07/01/2004	11/17/2005 - current
26th Ward Water Pollution Control Plant Brooklyn, NY	Wastewater Treatment	New York Power Authority	Digester Gas	2	400 kW	07/31/2003	-
4C Foods Brooklyn, NY	Food Processing	Energy Concepts	Natural Gas	3	450 kW	06/24/2004	-
A.A. Dairy Candor, NY	Dairy Farm	RCM Digesters	Digester Gas	1	130 kW	02/01/2000	-
Allenwaite Farms Schaghticoke, NY	Dairy Farm		Digester Gas	1	140 kW		-
Allied Converters, Inc. New Rochelle, NY	Plastics Processing	Advanced Power Systems	Natural Gas	2	60 kW	07/07/2003	-
Allied Energy Storage			Natural				

List of NYSERDA Fuel Cell Demos

- **Four (4) Wastewater Treatment Plants in NYC = 1,600 kW.**
- **Verizon's Garden City Switching Office = 1,400 kW.**
- **Sheraton Hotel in NYC = 250 kW.**
- **SUNY ESF in Syracuse = 250 kW.**
- **Rochester Central School District = 200 kW.**
- **NYSERDA HQ in Albany = 10 kW.**

----- in development cycle -----

- Grand Central Terminal = 400 kW.
- Bronx Zoo = 200 kW.
- Hilton Hotel in NYC = 200 kW.
- Suffolk County State Office Building = 200 kW.

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Sheraton New York Hotel and Tower

811 Seventh Ave
New York, NY 10019

[Map It](#)

DG/CHP Developed by



Category: Hotel

SIC: 70 - Hotels, Rooming Houses, Camps, and Other Lodging Places

ISO Zone: J - New York City

Electric Utility: Consolidated Edison

Gas Utility: Consolidated Edison Co-NY Inc

Primary Fuel: Natural Gas

Number of Power Units: 1

Total Installed Capacity: 250 kW

Unit	Installation	Fuel	Prime Mover	Heat Recovery	Use	Technology Group	Installed Capacity (kW)
1	06/14/2005	Natural Gas	Fuel Cell	Hot Water	Domestic Hot Water	<300 kW Fuel Cell (MCFC)	250

Facility Details

[Show Complete Details](#)

Facility Documentation

[Sheraton New York NYSERDA CHP Details](#)
[Sheraton NY Online Database Notes](#)

Project Webpages

Online Monitored Data Reports

[Monitored Data - Plots and Graphs](#)
[Monitored Data - Download \(CSV file\)](#)
[Utility Rate Calculation](#)

Standardized Monitored Data Reports

[Generator, Facility, and Meter Power](#)
[Generator Status, Gas Use, and Heat Recovery](#)

Fuel Cell at Sheraton Hotel in NYC



- 250 kW Molten Carbonate Fuel Cell.
- Heat Recovery for DHW.
- Hoisted into place (rooftop setback) November 2004.
- Status: Fully Operational.



<http://chp.nyserda.org>

National Fuel Gas

4671 Porter Center Rd.
Lewiston, NY 14092

[Map It](#)

DG/CHP Developed by



National Fuel

Category: Single-Family Residence

SIC: 99 - Nonclassifiable Establishments

ISO Zone: A - West

Electric Utility: National Grid - New York

Gas Utility: National Fuel Gas

Primary Fuel: Natural Gas

Number of Power Units: 1

Total Installed Capacity: 5 kW

Unit	Installation	Fuel	Prime Mover	Heat Recovery	Use	Technology Group	Installed Capacity (kW)
1		Natural Gas	Fuel Cell	Hot Water	Boiler Feedwater Pre-heat	<300 kW Fuel Cell (PEM)	5

Facility Details

[Show Complete Details](#)

Facility Documentation

- [Fuel Cell Picture](#)
- [National Fuel CHP Schematic](#)
- [National Fuel NYSERDA CHP Details](#)
- [National Fuel Online Database Notes](#)

Online Monitored Data Reports

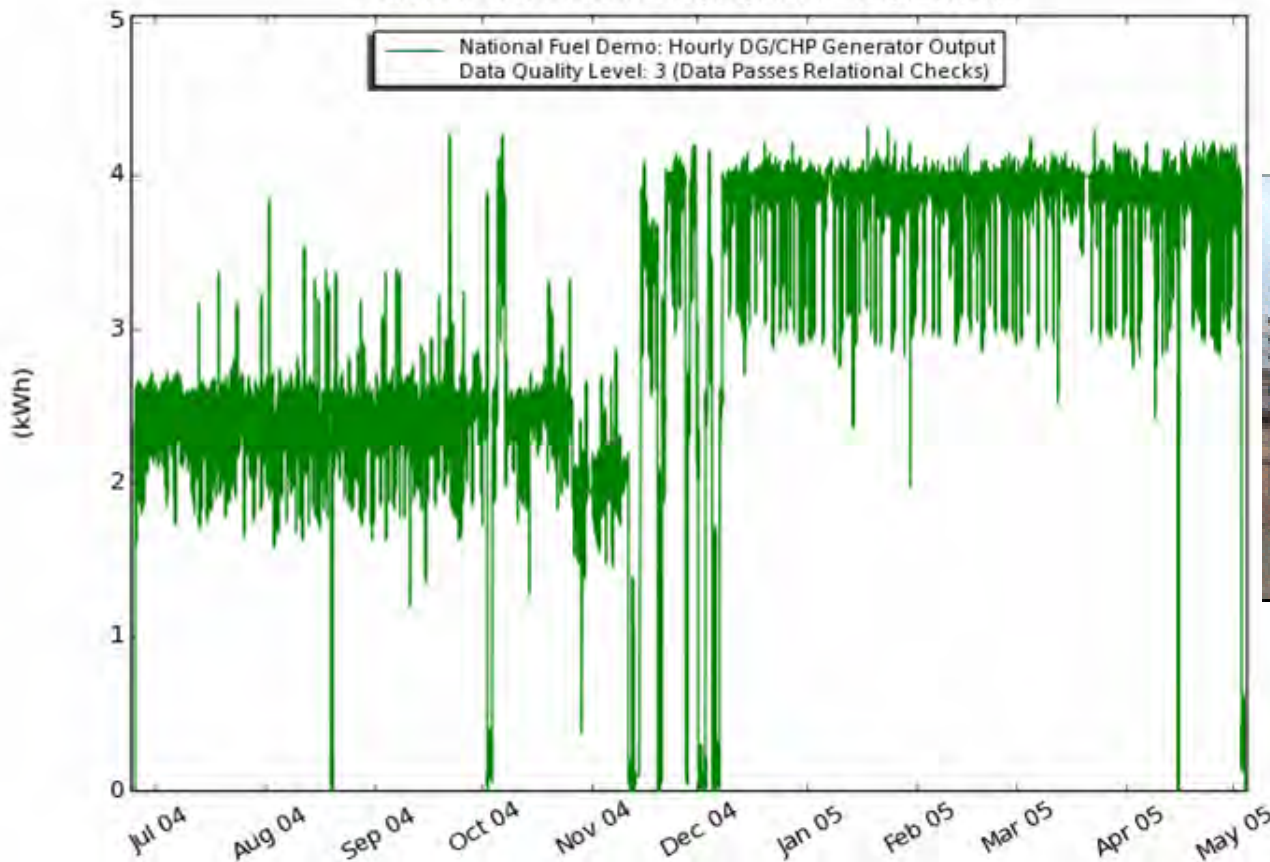
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Standardized Monitored Data Reports

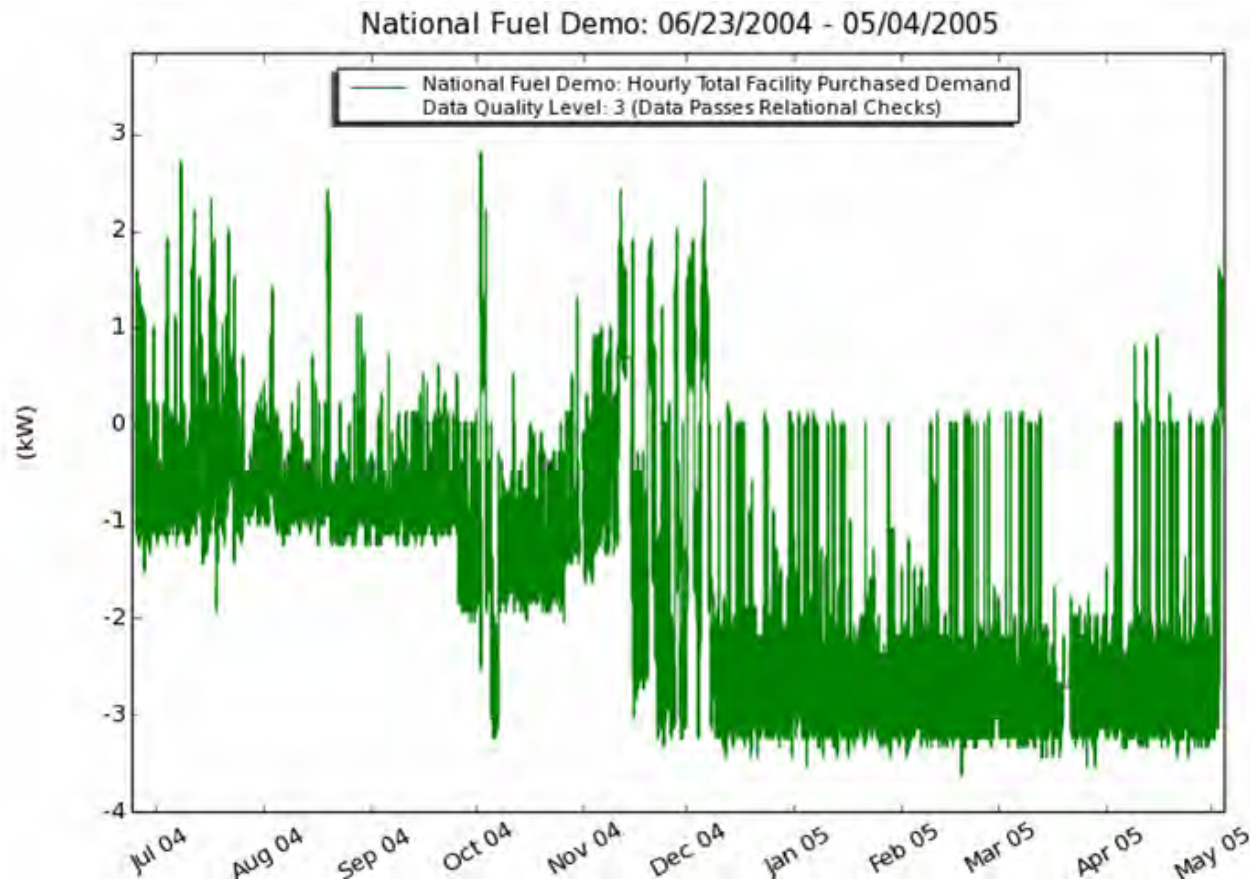
- [Generator, Facility, and Meter Power](#)
- [Generator Status, Gas Use, and Heat Recovery](#)
- [Generator Power Quality](#)

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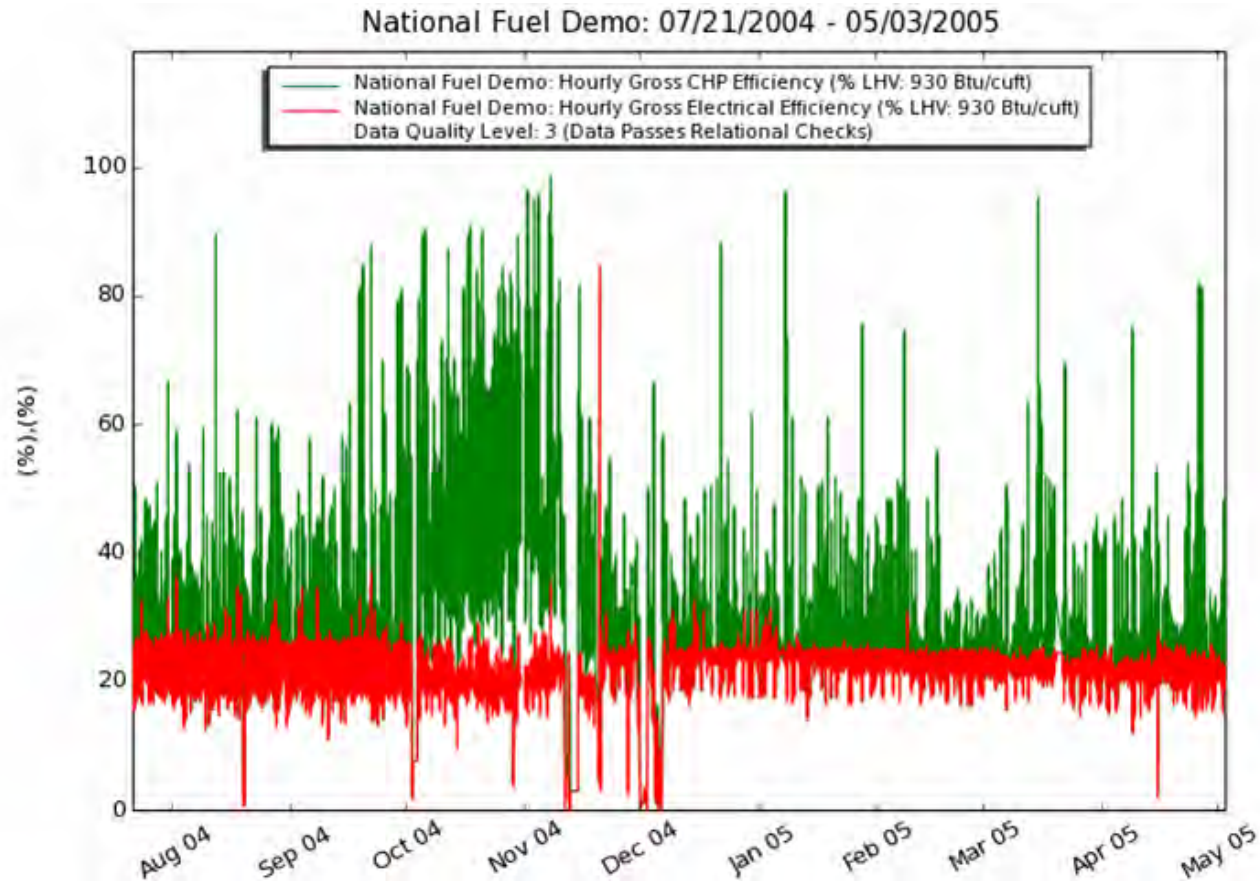
National Fuel Demo: 06/23/2004 - 05/04/2005



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Fuel Cells at WWTP in NYC

- Eight PAFC Fuel Cells at Four Municipal WWTPs in New York City (NYCDEP).
- Heat Recovered to Support Anaerobic Digester.
- Reduced On-site Emissions by Eliminating Flare.
- NYSERDA: \$1,000,000
NYPA: \$12,000,000
- All 8 Fully Operational.



Fuel Cells at NYSERDA Headquarters

Two Plug Power Fuel Cells.

Rated at 5 kW each.

Operates on bottled hydrogen.

Used for back-up power for computer and telecom.

Status: Fully Operational



www.nyserda.org

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