

# PROJECT UPDATE

August 2005

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## Project Participants

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## Project Location

Statewide



<http://www.rocairport.com/org36.asp?storyID=2158>  
The combined-heat-and-power (CHP) cogeneration plant for the Rochester International airport.

## Contact Information

For more information on this project see:

<http://www.nyserra.org/programs/environment/emep>

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## Keywords

- Cap-and-trade programs
- Combined heat and power (CHP)
- Emission reduction credits (ERCs)
- Energy efficiency
- NO<sub>x</sub> and SO<sub>2</sub> allowance set-asides



New York State Energy Research  
and Development Authority  
Environmental Monitoring, Evaluation,  
and Protection Program



## Analysis of New Pollution Control Strategy Utilizing Emission Reduction Credits and Small-Scale Combined Heat and Power Units

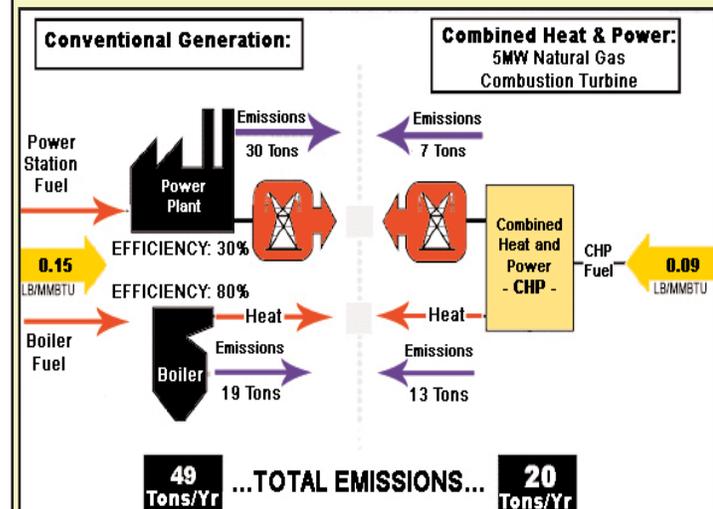
### PROJECT FOCUS

This project involves the development of an emission reduction credit (ERC) guidebook that is intended to assist smaller combined-heat-and-power (CHP) systems in applying for and securing ERCs from the New York State (NYS) Department of Environmental Conservation (DEC). ERCs can be granted for reductions in emissions of nonattainment pollutants that result from the deployment of small-scale CHP applications in New York State. In addition, the project team will assess how CHP units could be incorporated into the DEC nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) emission allowance set-aside programs now in effect. Information emerging from these findings will be presented in a NO<sub>x</sub> and SO<sub>2</sub> Allowance Set-Aside Report. By receiving ERCs and/or set-aside allowances, CHP projects can tap into significant incremental sources of market value. These incentives may help to promote the installation of additional CHP systems, benefiting the environmental and economic health of New York State.

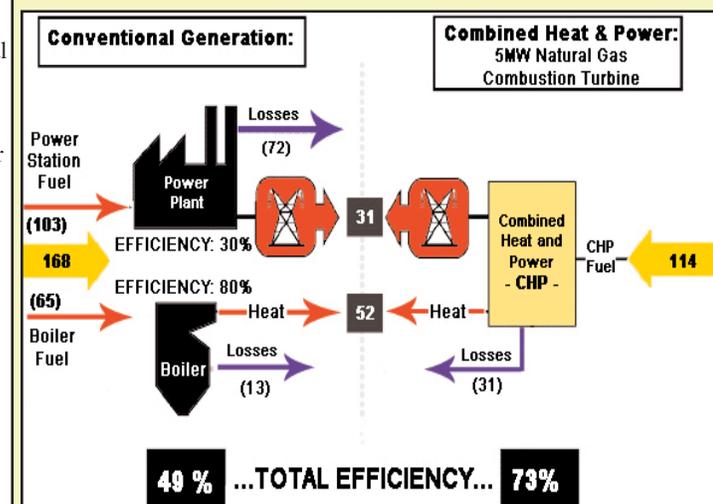
### CONTEXT

CHP, which involves the coincident production of heat and electrical/mechanical power from a single process and fuel source, may be a suitable option in industrial, institutional, commercial, municipal, and residential applications. CHP can be cleaner and more efficient and reliable than conventional methods of separately generating heat and power, as heat that is normally wasted in generating central-station electricity is instead used near the CHP system. By taking advantage of this otherwise wasted heat, CHP significantly increases overall energy efficiency. In addition, because CHP is located at the end-user's site, there are virtually no transmission and distribution line losses, which typically diminish the amount of power delivered from central power plants to the consumer by 5%-10%. The installation and operation of CHP units can also partially displace or enable the retirement of existing inefficient, high-emission, on-site customer boilers, producing additional efficiency and air-quality improvements. While there is significant technical potential in New York State for thousands of smaller CHP projects (<15 megawatt (MW)) at commercial and institutional facilities, the economic rationale for such projects has not been compelling to date, and there are few such facilities in existence.

### An Illustrative Comparison Between the NO<sub>x</sub> Emissions and the Total Efficiency of Separate Heat and Power (Conventional) and Combined Heat and Power Applications



The conventional generation units are assumed to operate on gas or No. 2 fuel oil and are typical of older, existing fossil units.



Fuel input, heat output, electrical output and losses are all shown in the same (unspecified) unit of measure for illustrative purposes.

Credit: Andrew Greene

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<http://www.energyprojects.co.uk/chp.htm>  
CHP heat exchanger.

## Project Status

- Initiated 2003
- Project ongoing



Since 1975, the New York State Energy Research and Development Authority (NYSERDA) has developed and implemented innovative products and processes to enhance the State's energy efficiency, economic growth, and environmental protection. One of NYSEDA's key efforts, the Environmental Monitoring, Evaluation Protection (EMEP) Program, supports energy-related environmental research. The EMEP Program is funded by a System Benefits Charge (SBC) collected by the State's investor-owned utilities. NYSEDA administers the SBC program under an agreement with the Public Service Commission.

## METHODOLOGY

This project focuses on how CHP units can be treated within the context of existing regulations for ERCs and the DEC's "cap-and-trade" allowance programs. To date, smaller CHP units have not actively participated in the DEC's ERC or emission allowance programs. While this project is not intended to result in new DEC regulations, the application of existing rules and regulatory practices to smaller CHP units introduces new questions of regulatory interpretation. This project aims to identify the ways in which existing rules and practices may leave some uncertainties with regard to the role of smaller CHP units and to suggest possible approaches for consideration by the DEC. While the intended audience for the ERC Guidebook is the end-user and/or CHP system developer, the Allowance Set-Aside Report is meant to inform policymakers on issues pertaining to smaller CHP systems within the fairly broad language of existing cap-and-trade rules, in particular the allowance set-aside provisions.

### ERC Guidebook Development for Smaller CHP Systems

ERCs are issued when an air pollution source, such as an end-user's boiler, makes real, quantifiable, surplus, and verifiable reductions in its emissions of nonattainment pollutants. Once issued by the DEC, ERCs are bankable for current or future use and can be bought and sold in established emission trading markets.

In developing the ERC Guidebook, the project team is:

- Conducting research to determine existing federal and state ERC regulations, assessing current ERC markets, and identifying existing DEC practices;
- Reviewing the status of emissions certification procedures of CHP manufacturers, whereby costly site-specific stack testing or emissions monitoring procedures may potentially be avoided;
- Clarifying and illustrating the process for smaller CHP system owners/operators to apply for and receive ERCs from the DEC; and
- Sharing findings with the DEC to assist in the development of regulations for emissions from small distributed-generation (DG) units, including CHP units.

### NO<sub>x</sub> and SO<sub>2</sub> Allowance Set-Aside Report

The DEC currently has three cap-and-trade emission rules that are designed to reduce the overall level of emissions from electric generators of 15<sup>+</sup> MW and large industrial sources:

- 6 NYCRR Part 204 (ozone season NO<sub>x</sub> emissions [May-September])
- 6 NYCRR Part 237 (non-ozone season NO<sub>x</sub> emissions)
- 6 NYCRR Part 238 (year-round SO<sub>2</sub> emissions)

Each of these rules includes an identical "set-aside" provision, which would reserve 3% of the total allowance cap as economic incentives awarded to qualifying renewable-energy and energy-efficiency (EE/RE) projects. Upon receipt of set-aside allowances, EE/RE projects would be able to sell them in established emission markets and thereby realize additional value.

The Set-Aside Report will suggest specific ways in which smaller CHP units can participate in the DEC cap-and-trade programs. Although small CHP units are not regulated sources under these rules, they stand to benefit through voluntary participation, which yields surplus emission allowances that can be sold. In developing the Set-Aside Report, the project team is:

- Conducting a survey to identify and assess set-aside policies and programs in other states and at the federal level;
- Developing potential allowance set-aside protocols for CHPs;
- Investigating policy considerations; and
- Analyzing the benefits of set-aside allowances in comparison with ERCs and determining whether the two approaches are complementary for smaller CHP systems.

## PRELIMINARY FINDINGS

Preliminary draft documents are pending review by the Project Advisory Committee and will be released in early 2005.

## PROJECT IMPLICATIONS

Although there is currently ~5000 MW of installed CHP capacity at 210 sites in New York State, approximately 78% of this capacity is produced by a few large CHP (15+ MW) units located predominantly at industrial facilities. A recent NYSEDA study found that of the 8500 MW of technical potential for new CHP installations, 74% is for small systems of less than 5 MW that could be located primarily at commercial and institutional facilities. Despite this significant technical potential, the market penetration of small CHP units has been minimal to date. The findings of this project will contribute significantly to the development of market incentives in New York State that facilitate the transition to cleaner and more efficient technologies with environmental and economic benefits.