



New York State Energy Research and Development Authority

# Hazel Towers

## Engine Generators Provide Hot Water

DG/CHP Program

Project Profile

# Combined heat and power for Apartment Building



### Overview

Hazel Towers is a 286 unit, multi-family residential building located in Bronx, NY. Electricity consumption peaks in winter; the electrical demand can exceed 450 kW. Residents are encouraged to conserve energy since the individual apartments are submetered.

Two 60 kW engine-generator sets were installed in the building to produce electricity and domestic hot water (DHW). The generators operate in parallel with the utility and produce more than a third of the site's electricity. The generators run continuously at an average CHP efficiency of 52% HHV.

### Quick Facts

**Location:**  
Bronx, NY (Con Edison)

**Installation Date:**  
May 2004

**Operating Experience:**  
20 months (as of January 2006)

**CHP Equipment:**  
Two 60 kW IC Engines

**Generating Capacity:**  
120 kW

**Heat Recovery Application:**  
Domestic Hot Water (600 MBtu/h peak)

**Design CHP Efficiency:**  
~75% HHV (peak)

**Type of Fuel:**  
Natural Gas

**Annual Utility Savings:**  
\$50,000 per year (estimated)

**Simple Payback:**  
10 years (estimated)

### The Application

Like many similar buildings, Hazel Towers was master metered for electricity. Energy costs were passed through in the rent without regard to usage. The building was converted to submetering but retained the master meter; tenants now pay the landlord for electricity based on their consumption. This is advantageous because residents pay for their own usage while still obtaining energy on a bulk rate. The CHP system can also offset electricity for the entire facility rather than just common areas as would have been done if the apartments were direct metered by the utility. This allows a larger capacity CHP system to be used.

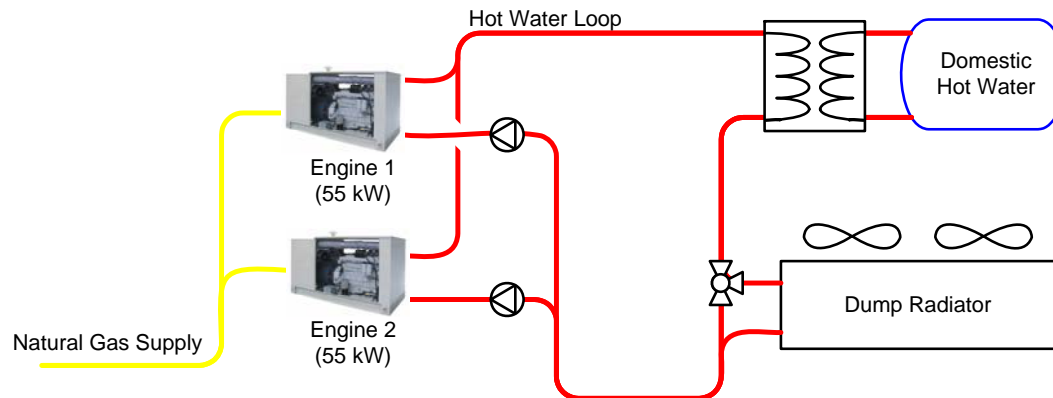
Two packaged engine-generator sets were installed in the building. The engines were selected to match the site's heating requirements and the modular design provides additional reliability. The output of one unit is sufficient to meet the nominal thermal load though both generators are normally operating.



Installed CHP Modules

## CHP System and Equipment

The CHP system is configured on two, 60 kW natural gas fired engine-generator sets. Electricity is produced in parallel with the utility grid; the output can be modulated to follow the thermal load though more electricity can be generated when desired. Waste heat from the engine jackets and exhaust is recovered as hot water that is circulated through a heat exchanger on the return side of the DHW distribution system. The flow of potable water and any required make-up is thus preheated and the fuel consumption of the existing heater is proportional reduced. Any excess heat produced by the engines is rejected to atmosphere through an external radiator.



## Economics and Environmental Benefits

Monitored data are being collected from the site by Connected Energy and are available in an hourly format on NYSERDA's DG/CHP website starting from October 2006. The CHP system produced more than 730,000 kWh in 2007. The peak electrical demand at the site has been reduced by an average of 100 kW per month. A payback period approaching ten years is expected based on estimated annual energy savings of \$50,000. The system offsets 60,000 therms of fuel than would be otherwise be consumed in the site's conventional DHW heater. The greater efficiency of the CHP system as compared to using separate electric and thermal utilities should yield significant reductions in carbon dioxide emissions.



Engine Coolant to DHW Heat Exchanger



External Dump Radiator

## Summary of Benefits

- Modular configuration simplifies installation
- Multiple units provide redundancy
- Indirect submetering allows use of larger capacity system

“Indirectly, we all have a stake in this. It’s good to know the energy we’re using is produced in an efficient and environmentally friendly way.”

- Anonymous

## Web Links and Further Information:

DSM Engineering Associates, P.C. – Developer/Engineer

## Equipment Manufacturer

[www.coastintelligen.com](http://www.coastintelligen.com)

## Other DG/CHP Resources

[chp.nyserda.org](http://chp.nyserda.org)

Prepared for NYSERDA by:  
CDH Energy Corp.  
Cazenovia, NY 13035  
315-655-1063  
[www.cdhenergy.com](http://www.cdhenergy.com)  
[dgchp\\_data@cdhenergy.com](mailto:dgchp_data@cdhenergy.com)