

HOTEL AND HOSPITALITY

Company Name
New York City Marriott -
Midtown Manhattan

Location
New York, NY
(New York County)

Installation Date
April 2010

Operating Experience
Beginning 2010

CHP Equipment
Two Capstone 60 microturbine
arrays (5 and 6 units)

Generating Capacity
715 kW

Heat Recovery Application
Space cooling and heating

Design CHP Efficiency
70% - 80%

Type of Fuel
Natural Gas

Annual Utility Savings
\$80,000

"Because of CHP, the US already annually avoids 1.9 quadrillion British thermal units (Btu) of fuel consumption and 248 million metric tons of carbon dioxide emissions – the equivalent of taking 45 million cars off the road."

- Oak Ridge National Lab

CHP Helps New York City Hotel Decrease Its Energy Consumption

BACKGROUND

The New York City Marriott in midtown Manhattan is a 49-story hotel, with 1,892 rooms and 57 suites. The Marriott Hotel decided to undertake a corporate-wide project of decreasing energy consumption by 25% by 2017. Installing microturbines at their downtown NYC hotel was a step toward meeting that goal.

THE APPLICATION

The NYC Marriott chose to install two arrays of 60 kW microturbines; six in one array and five in the other. Installation of microturbines in certain applications in NYC has been encouraged as a way to decrease the load on the current utilities serving the area. Doing so will also decrease emissions, reducing negative impact upon the environment.

Microturbines capture the heat waste generated by their turbines in producing electricity and transform it into usable energy, making them between 70 and 80 percent efficient (compared with 30 to 35 percent efficiency for most types of power plants). The hotel is the first in the city to use this technology to provide its own heating, cooling and electricity on site.

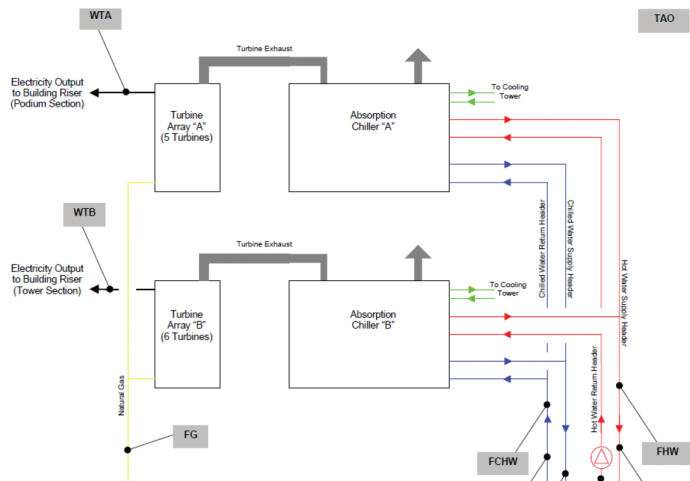
CHP SYSTEM AND EQUIPMENT

The Carrier PureComfort CHP system installed at the New York Marriott Downtown consists of two Carrier PureComfort systems that utilize several Capstone 60 Microturbines and a Carrier exhaust fired absorption chiller on each system. The first CHP system (System "A") uses five (5) 60 kW microturbines to produce more than 239 kW of electrical output and 149-tons of chilled water output. The second system (System "B") uses six (6) 60 kW microturbines to produce more than 285 kW of electrical output and 173-tons of chilled water output. Both chillers have the capability to act as heat exchangers during the heating season to provide hot water.



New York City Marriott - Midtown Manhattan

Combined Heat and Power for Hotel and Hospitality Building



ECONOMICS AND ENVIRONMENTAL BENEFITS

The system is estimated to reduce annual carbon emissions by 1,700 tons and nitrogen oxide emissions by more than 10 tons. The Marriott is trying to maximize savings by reducing its reliance on the local utility, which will also result in more power available on the grid for other customers during peak use times. It is anticipated that the Marriott will significantly reduce annual electric power usage from the utility, resulting in a savings of about \$80,000 annually. Each year the system will offset 5,800 megawatt hours of electricity, enough to power 700 homes. Additional benefits include reduction of electric line losses, reduction in fuel use and cost for heat, reduction in pollutant emissions, and improved power quality.

SUMMARY OF BENEFITS

- Reduces carbon footprint.
- Decrease in energy use from the grid.
- Significant reduction in energy costs.

ADDITIONAL RESOURCES

- **Equipment Manufacturer:** Capston Turbine Corporation®, <http://capstoneturbine.com/>
- **DG Integrated Data System:** chp.nyserda.org