CHP System Lowers Hospital's Carbon Footprint

HEALTHCARE

Company Name
Rome Memorial Hospital

Location
Rome, NY

Installation Date
2011

Operating Experience
Began June 2011

CHP Equipment
Four Capstone model C65ICHP microturbines

Generating Capacity
260 kW

Heat Recovery Application
Space heating, domestic hot water

Type of Fuel
Natural Gas

Annual Utility Savings
Approximately 30%

"By installing a CHP system designed to meet the thermal and electrical base loads of a facility, CHP can increase operational efficiency and decrease energy costs, while reducing emissions of greenhouse gases that contribute to the risks of climate change."

- EPA's CHP Partnership website

BACKGROUND

Rome Memorial Hospital in Rome, NY

Rome Memorial Hospital (RMH) in Rome, NY, was looking for a way to reduce operating costs and avoid the fluctuating costs of fuel oil and natural gas. The goal was to do that and to reduce the hospital's carbon footprint. Another priority was that the system be simple, reliable and not require a large amount of maintenance and upkeep. RMH ultimately decided to install four microturbines to install a partial-distributed generation Combined Heat and Power (DG-CHP) system.

THE APPLICATION

The CHP system is made up of four Capstone model C65ICHP Microturbines. Each microturbine produces 65 kW for a total of 260 kW for the full system. The plant supplements the hospital's thermal and electrical loads and is located in the hospital's "Old Boiler Room." The system is sized/arranged to operate at peak thermal and electrical performance and at full capacity 24hrs/day, 365days/year. The hospital's hot water reheat system(s) provide the most significant year-around thermal load, which drove the sizing of the DG-CHP system. The electricity generated as a result of providing the reheat energy is always needed, as it accounts for less than 30% of the facility's total demand.

CHP SYSTEM AND EQUIPMENT

Capstone model C65ICHP microturbines

The design of the DG-CHP system comprises four Capstone model C65ICHP micro-turbines with integral heat recovery modules. All four units operate simultaneously producing AC power. Each turbine produces 205° F hot water via their on-board heat recovery heat exchangers; approximately 1.6 MMBtu/hour. This heat is piped to the hospital's existing terminal reheat systems for which there are consistent, year-around base loads. The micro-turbines operate in parallel with the grid, but are sized for a small fraction of the facilities demand; therefore, there is no potential to export power at the point of service entry; production is approximately 2 million kW.

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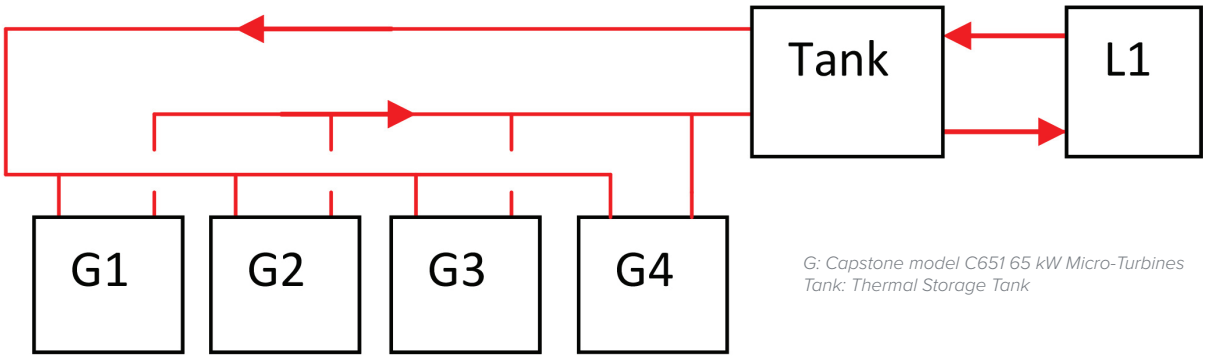
Combined Heat and Power for a Healthcare Facility



G: Capstone model C651 65 kW Micro-Turbines
Tank: Thermal Storage Tank

ECONOMICS AND ENVIRONMENTAL BENEFITS

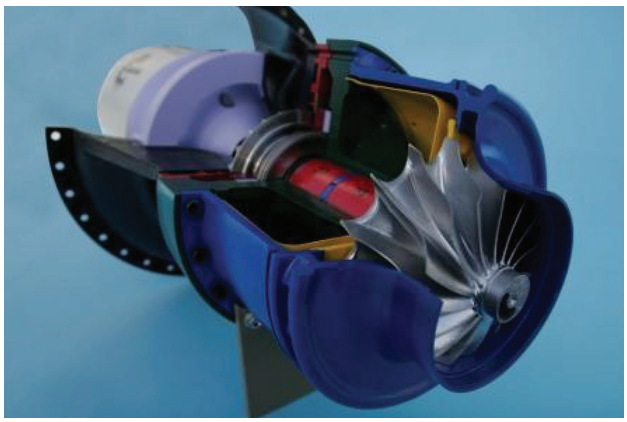
As a result of the four microturbines, electrical demand was reduced thereby reducing costs. Recovered heat is used for domestic hot water (DHW) and also reduced costs usually associated with that. The overall carbon footprint of the Rome Memorial Hospital has also been reduced, realizing one of the original goals of installing the DG-CHP system.

SUMMARY OF BENEFITS

- Reduced costs for energy needs.
- Recovered heat used for DHW and other heat requirements.
- Reduced carbon footprint.

ADDITIONAL RESOURCES

- **Developer/Engineer:** www.ipdengineering.com
- **Equipment Manufacturer:** www.capstoneturbine.com
- **DG Integrated Data System:** chp.nyserda.org, www.northeastchp.org



Interior Views of Capstone Microturbines

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