

Margaret Tietz Center for Nursing and Rehabilitation



- ▶ Building cooling, heating and power (BCHP)
- ▶ 200-bed nursing home
- ▶ Special financing yields quick payback
- ▶ Queens, New York

Nursing Home's New Cogeneration System Cuts Electric Costs While Saving on Cooling and Heating

A not-for-profit Queens, New York nursing home is saving \$113,000 a year in energy costs with a natural gas-fired cogeneration system that supplies nearly all the building's electricity, along with thermal energy for heating, air-conditioning and hot water.

"The savings are incredible," says Ben Messa, Director of Engineering and Security for the Margaret Tietz Center for Nursing and Rehabilitation. "The people from Con Ed (the local power utility) came in and asked, 'What are you doing differently?' I joked, 'We turned the lights off.'"

The nursing home's first venture into cogeneration began in 2000, with the installation of a 60 kW power generator at the nursing home. It provided immediate relief from high electric bills.

"Since the savings were so dramatic, we went to three brand-new Tecogens a year ago in 2006," Messa reports. "They're working perfectly. They are really doing what they're supposed to do."

"At this point, they're working top notch," says Gerald Hart, Executive Director.

The nursing home is now able to produce 95% of its electricity at less expense than it would cost to buy it from the power company. Because the facility operates around the clock, 365 days a year, it has a large thermal requirement for space heating, cooling and hot water, so utilizing heat from the generation process for these purposes yields significant additional savings.

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Comprehensive energy audit shows the way

The expanded cogeneration project was launched when Mike Wilson, Principal Owner of Energy Solutions of NY, LLC, an energy consulting firm, evaluated the facility and determined that it could benefit from energy-saving measures. Wilson arranged for Pathfinder Engineers, LLP, of Rochester, New York, to undertake a comprehensive energy audit of the nursing home.

The firm came up with a plan that involved installation of three 75 kW Tecogen CM-75 cogeneration modules, along with replacement of the boiler system, absorber and domestic hot water heating system, according to Lynn G. Bellenger, P.E., LEED AP, a partner with the firm. A direct digital control system integrated the separate stand-alone devices into a single platform, making it easier to monitor them. In addition, a new emergency generator was installed to provide power for the entire facility in

the event of a blackout.

“We saw the advantages of cogeneration through the installation of the initial unit, and when we decided to upgrade the central plant, we believed that we would see the benefits of a larger capacity,” says Kenneth Brown, retired President and CEO of the facility.

Wilson obtained funding from the New York State Energy Research and Development Authority (NYSERDA) to cover 50% of the cost of the energy study.

“I pre-qualify them and propose solutions – energy conserving capital improvement projects,” explains Wilson. “I leverage savings and grant funds to offset the costs, and try to make it as budget neutral as I can.” The company also oversees installation, commissioning and startup. By leveraging project capital reimbursements through energy savings and New York State Department of Health Care programs, Energy Solutions enables nursing homes to adopt cogeneration and achieve quick payback.



In order to work within a limited space, the two new boilers were fabricated on-site by Easco Boiler Corp., according to Al Rodgers, Senior Mechanical Engineer at Pathfinder.

“Physically, there was no way to get a pre-fabricated boiler in the building,” explains Rodgers. “They had to be made on site.”

This integrated system allowed for a great degree of flexibility in installation, without interruption of heat and hot water. The system is designed to maximize the energy savings with a year-round thermal load.

Each of the 200 hp boilers can supply up to 8.4 million Btu of steam. They operate on natural gas, but can be switched to run on fuel oil as a backup. To reduce operating costs, a water loop circulates through each CHP module’s exhaust heat exchanger, raising the water temperature before it enters the boilers. The boilers supply all domestic hot water for the facility, along with low-pressure steam to operate a 200-ton Trane indirect-fired absorption chiller for summer air conditioning. During the cold months, the steam is used to create hot water for space heating by means of a heat exchanger.

Rodgers says the facility has a constant steam load year-round.

The Trane absorption chiller provides cooling for the 1st through 4th floors of the nursing home, which was built in 1968. A separate 100-ton Trane electric chiller cools the 5th and 6th floors, which were added in 1972.





Grants reduce project costs

The entire project cost a little more than \$900,000 after various grants, according to Bellenger. National Grid contributed natural gas booster equipment for the generators, while NYSERDA provided a \$90,000 grant for the CHP modules.

These incentives make it possible for facilities to make energy improvements that will help their bottom lines for years to come.

“It allows a facility to be much more energy efficient, and spend less money doing it; and also it takes a facility like this and gives it an extended useful life,” Wilson says. “The Margaret Tietz Nursing Home was built in the early 1970s, and now it has an all-new, state-of-the-art, energy-efficient central plant.” Such retrofit projects, he adds, also benefit

government agencies that support nursing homes by helping them avoid the expense of constructing new facilities. Cost savings are leveraged to pay for additional energy-saving projects such as for improved lighting. Finally, the nursing home residents and staff are able to enjoy a much more comfortable living and working environment.

“National Grid is always working to find ways to assist our customers with innovative energy solutions,” says Joe Paino, Senior Account Executive with National Grid. “We are pleased to participate in a project like this that provides energy efficiency and cost savings to our customer. We also have a special discounted natural gas rate for combined heat and power projects like this one to allow customers to achieve an even quicker payback on their project.”

Pathfinder Engineers, LLP received a 2006 Platinum Award for Engineering Excellence from the American Council of Engineering Companies of New York for its work on the Margaret Tietz Center for Nursing and Rehabilitation energy project.

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