

TECOGEN

CM-60 & CM-75 COGENERATION MODULES

CASE STUDY

Long Island nursing home empowered by change

The cost of electricity, combined with environmental concerns motivated the Maria Regina Residence to install two state-of-the-art on-site CHP modules, manufactured by Tecogen and distributed by All Systems Cogeneration.

In 1965 the Sisters of Saint Joseph established Maria Regina Residence, a healthcare facility in Brentwood, New York, with the goal of helping to sustain life for future generations.

Now, more than four decades later, Maria Regina Residence has extended that notion of sustaining life to include the environment by embracing the use of two 75-kilowatt Combined Heat and Power (CHP) modules. These modules increase efficiency and decrease energy costs, while also reducing greenhouse gas emissions. Distributed, installed and maintained by All Systems Cogeneration (based in Bohemia, New York) and manufactured by Tecogen (based in Waltham, Mass.), the two modules were put into service in April 2009 to provide Maria Regina Residence with electricity and domestic hot water.

CHP is an efficient, effective, and clean approach to generating power and domestic hot water simultaneously and from a single fuel source. At the forefront of this technology for the past 25 years is Tecogen, who has been in business with All Systems since the late 1990s. The Tecogen CHP (or cogeneration) module uses a natural gas-fired internal combustion engine to generate power onsite to meet a significant proportion of the building's electricity needs. Unlike traditional power plants where the heat produced when electricity is created

has no practical use and is generally discarded, the CHP module's onsite location permits the harvesting of this waste-heat. The overall effect is dramatic: a two-fold increase in efficiency with the tangible environmental benefit of carbon emissions being reduced by half.

The growing need for efficient, cost-effective power has been a key issue for Maria Regina ever since being certified in 2002 to provide continuing and rehabilitative care for 188 residents. A surge in the cost of electricity ultimately caused Maria Regina's facilities Manager, Kevin Pollack, to consider adopting CHP technology. Then in early 2004, he had the opportunity to meet All Systems' president Gregg Giampaolo and the choice became clear. "I met Gregg at a trade show and I'm glad I did," Pollack said. "It was All Systems' knowledge of both energy and CHP that set them apart from other cogeneration companies. Also playing a key role was their reliability and complete package of service. The team was there every step of the way and that really made a difference." "Like any residential nursing home facility, Maria Regina draws a lot of power, which is what made it a prime candidate for this technology," said Giampaolo.

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CHP is twice as efficient as the electric utility, which means the Tecogen system produces electricity for less than 50% of the cost, while utilizing up to 90% of the waste heat as thermal energy for hot water.

Because there is a continuous demand for both hot water and electricity throughout the year, Maria Regina can take full advantage of increased energy efficiency and lower energy costs. "Because the facility operates 24 hours a day 365 days a year, they are able to utilize nearly 100% of the waste heat."

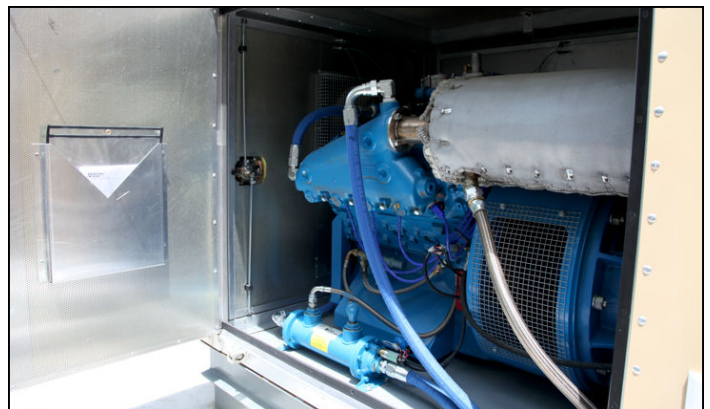
"Every penny we save from the CHP system will go right back to providing top care for our residents, which is always the goal," said Pollack. The vast majority of Maria Regina residents are from the congregation of the Sisters of St. Joseph, but the facility is not limited to religious women and men. "Keeping energy bills low is important for any business, but for our residential healthcare facility it has to do with our commitment to quality long term care." Giampaolo states that the site will recoup the entire investment cost in less than three years through lower utility bills. "CHP is economically empowering for businesses," said Jeff Glick, Tecogen's regional sales manager. "Using the waste heat byproduct is enormously rewarding because it allows businesses to gain control over out-of-control energy prices. It makes perfect economic sense."

While the aim was to modernize the facility to meet economic goals, it was equally important to retain the historic characteristics that distinguish the grounds. Maria Regina Residence sits on a 212-acre campus, established in 1896 by the Sisters of St. Joseph and designed by Frederick Law Olmstead, who famously designed New York City's Central Park and Prospect Park, as well as Boston's Emerald Necklace. Along with the nursing home, the picturesque grounds also house a school, a convent, a church, and a nursery. The Tecogen unit is an unobtrusive addition to the facility, Pollack said. "It's not generating noise that would bother

the residents." To ensure the noise wouldn't be a problem, All Systems and Tecogen placed the unit in an acoustic enclosure. "So far, it's been perfectly quiet and hasn't disrupted the sense of serenity on campus," said Pollack. The equipment was also designed to blend into the scenery. "The cabinets are a neutral color so you would really never notice them," he said.

In addition to the benefits offered to Maria Regina's owners and residents, there are also environmental incentives that benefit the health of the planet. "A sustainable future ranks high on our list of priorities," said Pollack. "We were attracted to CHP technology because not only will it save money, but also because it presents an opportunity to respond to some of the burgeoning energy and environmental needs of the 21st century." The CHP system will play a significant role in reducing energy consumption on Long Island and allow the facility to use less of the world's limited fossil fuel resources. The system will also reduce the site's carbon output. "People concerned with issues of global warming and greenhouse effects will agree CHP deserves consideration, since CHP produces less greenhouse gases," said Giampaolo. "CHP is a viable choice to meet energy requirements. By capturing the waste heat byproduct generated in the production of electricity, the system uses less fuel. Less fuel means less emissions."

After only two months of running the unit, Pollack wholeheartedly supports the technology: "It's a fantastic system in terms of quality and how it works. We're very pleased so far. I would recommend it to anyone interested in reducing energy bills," he said. "As the cost of electricity continues to rise, Tecogen's CHP technology and All Systems' superior service provides a great opportunity for Maria Regina to implement energy conservation measures to cut costs and reduce its carbon footprint. The money we save by operating a CHP system can be put back into ensuring the best care for our residents."



CHP is considered a green-building strategy by the U.S. Senate Committee on Energy and Natural Resources.