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Case Study

Combined Heat and Power Solution Saves University USD $1,000 a Day

Siemens engines and gen-sets

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The Opportunity
Located in Middletown, CT, Wesleyan University is a premier liberal arts college, with approximately 3,000 students, and comprising 307 buildings on 370 acres.

The university's physical plant department is responsible for the upkeep of the university's power and heat infrastructure in the school's 300 plus buildings.

In 2008, the department's engineering team installed a combined heat and power (CHP) unit (not a Siemens system) to help reduce energy costs. CHP is a process that uses the heat normally wasted during electricity generation rather than releasing it into the atmosphere.

Following the massive storm that hit the Northeastern US in 2011, plus the aftermath of Hurricane Sandy wherein the university experienced severe power and heat outages, the team developed a plan to prevent similar power outages in the future. The university decided to take advantage of a Connecticut program which provides grants to organizations in the state that invest in micro grid or distributed generation projects. Wesleyan University was the first in the state to be approved for a micro grid project and was the only applicant that proposed a CHP solution.

Siemens engine helps university in northeastern United States optimize energy potential of athletic facility by combining heat with on-site power production.

The Solution

Siemens, through its Northeast distributor Kraft Power, supplied a Siemens SGE-36SL gas engine as part of a CHP project at Wesleyan University. The CHP system is saving the university an average of 1,000 USD a day from lower gas and electricity usage.

Commissioned in March 2014, the CHP solution from Siemens serves as the primary heat source for the athletic facility. The 676 kilowatt-electric kWe system provides hot water for basic services, keeps the pool temperature at 80 degrees Fahrenheit (27 degrees Celsius) and heats the hundreds of gallons of 150-degree (66 degrees Celsius) water needed for the building's ice rink. It also provides 90 pounds per square inch (psi) (6.2 bar) steam, generated from the engine's exhaust, to the campus.

Kraft Power, Siemens' distributor and service provider in the Northeastern United States, sold the project and designed and provided a custom acoustical enclosure for the equipment package. Martin Energy Group built the CHP package using a Siemens SGE-36SL gas engine.

Benefits

- System provides reliable source of power and heat
- Backed by a maintenance team available in one-to-two-hour window
- Reduces vulnerability to power outages
- Produces power at rates lower than electric utility

Siemens combined heat and power systems can be designed to accommodate a wide range of fuels, including natural gas, biogas, waste heat, hot water, waste steam, and biomass. CHP systems typically range from 250kWe to 2MWe.

Siemens engines help clients optimize the energy potential of their facility by combining heating with on-site power production. By generating electricity on site and recovering heat that would typically be wasted in a conventional power plant, clients benefit from increased energy efficiency and substantially reduced energy costs and carbon emissions.

The Business

Siemens is among the largest suppliers of rotating equipment solutions worldwide. The company offers some of the most efficient and environmentally friendly technology platforms, products and services in distributed power generation for oil and gas, industrial, institutional, and commercial clients and rural electrification programs.

Our solutions include combined heat and power (CHP) systems, biogas-fueled gen-sets, hybrid systems (solar photovoltaic and engine-based gen-sets), biomass and waste-to-energy steam turbine generators, compressed air energy storage (CAES), and more. We are also developing new technologies that use fossil fuels and renewable energy resources more efficiently, such as our wave energy-based HydroAir® turbine.

"In a project like this, what's important is reliability," said Alan Rubacha, director of Wesleyan's Physical Plant. "That's why we chose a Siemens engine. We wanted an engine that was going to be available 95 percent of the year or better. And so far, we're hitting about 95 percent. The installation and commissioning were completed flawlessly. There were no issues at all."