Cogeneration

> Case History
William Floyd School District, USA

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Cummins Power Generation

Where:
Three school buildings on the Shirley, NY, campus of the William Floyd School District

What:
Combined heat and power system featuring two 1.25 MW lean-burn gas generator sets, a waste heat recovery system, an absorption chiller and a 1.25 MW diesel generator set for standby power

Purpose:
Save money for the school district by providing nearly all of the electricity, heat and cooling for the Shirley campus during the local utility's daily peak usage hours when power is very expensive

Primary choice factors:
Cummins Power Generation provided the school district with the most cost-effective combined heat and power solution with low maintenance and user-friendly control systems

William Floyd School District uses CHP system to save money on high on-peak electric rates

SHIRLEY, NEW YORK — Located on the south shore of Long Island about 60 miles east of New York City, the William Floyd School District has eight school buildings and a student population of approximately 11,000. Faced with steadily rising on-peak electric rates that were straining operational budgets, the district decided to install a combined heat and power (CHP) system from Cummins Power Generation Inc. The system supplies on-peak electricity as well as heating and cooling to the three school buildings at its Shirley, New York, campus. In the first three years of operation, the CHP system has saved the school district more than $1.2 million.

The buildings on the Shirley campus include an elementary school, a middle school and a high school with a combined 900,000 square feet of space. The schools require about 2 MW of electrical power during the day, space heating during the winter and air conditioning during the summer.

The heart of the cogeneration system is a pair of 1.25 MW gas generator sets from Cummins Power Generation.

In addition to cost savings for the district, the cogeneration system provides students with an ongoing lesson about energy efficiency, conservation and reduction of greenhouse gas emissions.

CHP system displaces utility power and oil furnace

The CHP system consists of two PowerCommand® 1.25 MW reciprocating engine generators from Cummins Power Generation with a total generating capacity of 2.5 MW. The generator sets feature the Cummins QSV91G lean-burn natural gas engine that has proven itself in hundreds of on-site power installations around the world. The 91-liter engine has a high exhaust temperature in relation to the amount of electricity produced, making it ideal for CHP applications with large heating or cooling loads. In addition, the engine is one of the cleanest gas generating sets available today, and by displacing power generated by coal-fired power plants, it helps reduce the production of greenhouse gas emissions.

"In the winter months, the waste heat from the generator engines is used to supplement the heating system for the 220,000-square-foot middle school."

"We operate the CHP system from 10 a.m. to 10 p.m. daily, which corresponds to the utility's peak usage times," says Herb Hodge, plant facilities administrator for the William Floyd School District. "In the winter months, the waste heat from the generator engines is used to supplement the hydronic heating system for the 220,000-square-foot middle school. This allows us to shut down the large oil-fired boilers that normally provide heat to that building."

In the summer months, the system provides all of the electric power for the three schools on the campus when it is running, and the waste heat is used to supply a high percentage of the air-conditioning load during the summer. The CHP system produces about 400 tons of chilled water a day that power a 200-ton absorption chiller system in the high school building.

Selling excess capacity generates more income

In addition to the 2.5 MW of generating capacity with the CHP system, the system also includes a 1.25 MW diesel standby generator from Cummins Power Generation. "With the standby generator available, this gave us some excess capacity," says Hodge. "Working with an energy consultant, we started selling our excess generating capacity to the grid. By contracting to provide that capacity on an as-needed basis, we are paid about $10,000 per month," he says. The system also provides the students of the district with an ongoing lesson about energy efficiency, conservation and reduction of greenhouse gas emissions. And the money the school district saves helps provide students a better education.

For more information about cogeneration power systems or other energy solutions, contact your local Cummins Power Generation distributor or visit www.cumminspower.com/energysolutions.

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