

TECOCHILL®

CH-400x—CHILLER

SITE: ONE PARKWAY BUILDING— PHILADELPHIA



Study
Case

Hybrid Cooling Plant with Natural Gas Engine-Driven Chillers Delivers Savings for City of Philadelphia

The installation of a pair of 400-ton Tecogen natural gas engine-driven chillers in a City-owned office building is providing Philadelphia taxpayers some welcome savings.

“We’ve” had a dramatic drop in energy costs,” says Kent Miller, Executive Director of the City of Philadelphia’s Energy Office, which planned the new cooling system at One Parkway.

The building’s old cooling system cost \$238,000 a year to operate, he explains. “Now we’re in the \$80,000 a year range, so it’s been a dramatic change. It is impressive. They’re very efficient - everyone is delighted.”

The 500,000-sq.-ft. government structure, constructed in 1960, houses offices for a number of City departments, including the Law Department, Planning Commission, Capital Program Office, and Health and Human Services. It is also the fourth largest energy consumer among City-owned buildings.

Summer peak shaving reduces demand

“PGW is always looking for ways to help our customers maximize savings,” says

PGW’s Maryanne Campbell, Market Manager - Major Accounts.

“Shaving the summer electric

load produced by electric chillers, thereby reducing the billed demand for the rest of the year, is always an option we evaluate in a project. Obviously, it made a lot of sense for the City to install natural gas chillers in their One Parkway building.”

Gas Cooling makes good economic sense in Philadelphia because of its high electricity rates, according to Jeff Glick, Regional Sales Manager, TECOGEN, Inc.

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TECOCHILL DT_x SERIES CHILLER CASE STUDY: ONE PARKWAY

When the time came to replace the building's old chiller plant, the City opted to put in a hybrid natural gas and electric cooling system. Two Tecogen TECOCHILL CH-400x chillers were installed along with a 600-ton electric chiller.

"Now we set the electric chiller to run at 300 tons all summer, while the rest of the cooling is done by the gas chillers," Miller says. "This gives us some flexibility" in taking advantage of the best energy prices. The electric chiller is not intended to cool the entire building, which has an 800-ton cooling load, he adds.

Gas cooling makes good economic sense in Philadelphia because of its high electricity rates, according to Jeff Glick, Regional Sales Manager at Tecogen. "By installing the engine-driven chillers, they avoid high electricity costs," says Glick.

The demand component of the PECO HT electric rate that the City of Philadelphia is charged is \$25.41/kW. However, when the cost of the 80% demand ratchet is added in, the rate per kW that is charged to PECO customers actually becomes the highest in America. Because of this ratchet charge, customers with large

electric chillers, such as the City of Philadelphia, are actually paying a penalty all winter long because of a hot spell they experienced last summer.

He describes the chillers used in One Parkway as Tecogen's newest model, about 30% more efficient than the manufacturer's older engine-driven chillers, and twice as efficient as the old cooling system used in the building.

Emergency operations assured

"Each 400-ton chiller requires only 3 kW of single-phase electric power," Glick notes. "During a power outage, these chillers can be set up to operate with the building's emergency generator."

The building's operating costs have dropped an additional \$10,000 to \$15,000 a year by recovering the waste heat from the engine jacket coolant and engine exhaust gases. By utilizing this hot water, which is truly a byproduct without any additional fuel consumption being needed, the building's boilers are now not operated during the summer months.

Now city employees are able to work in a comfortable environment while at the same time the City of



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