

Saint Francis Hospital 1.6 MW CHP Application

Fact Sheet



CHP Application

High-on peak electric costs and reasonable natural gas prices, presented Saint Francis Hospital of 355 Ridge Avenue, Evanston, Illinois, the opportunity to install a CHP (Cooling, Heating, and Power) system to generate electricity, heating, and cooling and provide energy savings for the hospital. Two 800 kilowatt natural gas fired Caterpillar engine generator sets were installed in 1989 that provided 90% of the hospital's electric power and 5,600 lb/hr of low pressure steam at 15 psi. The \$1.2 million CHP project realized a payback within three to four years of operation proving CHP could work in a smaller sized application.

QUICK FACTS

Annual Savings:	\$400,000
Max. Monthly Savings:	\$41,246
Estimated Cost:	\$1.4 Million
Installed Cost:	\$1.2 Million
Simple Payback:	3-4 Years
Engine Size:	1.6 Megawatts
Operation Since:	1989
Facility Size:	450 Beds

Following the CHP installation, the electric utility was allowed to offer a lower rate, Rider 27. This resulted in the CHP system sitting idle. This practice by Commonwealth Edison is no longer allowed and deregulation will likely provide the financial incentive to re-commission the CHP system.



REASONS FOR CHP "ENERGY SAVINGS" & "SYSTEM EFFICIENCY"

Saint Francis Hospital's main goal has always been to treat its patients with the best available care at the most reasonable cost. Although the cost of a CHP system may be greater than is normally accepted for a bottom line driven business, a hospital that has been around for a long time and intends to be around

for an even longer time, with no shareholders to report to on a quarterly basis, the payback period and return on investment for the CHP project was determined to be in the best long term best interest of the hospital.

The hospital was able to make use of the thermal energy generated during both the winter and summer months raising the level of efficiency compared to a standard engine generator.

SYSTEM EQUIPMENT

- Two 800 kW natural gas fired Caterpillar internal combustion engines
- Two Kato synchronous generators, maximum total 1,600 kW
- Heat recovery equipment 5,600 lb/hr low pressure 15 psi steam
- 690 ton Trane lithium bromide absorption chiller

CHP OPERATION

Currently, Saint Francis Hospital does not operate the CAT engine generator sets. The hospital was offered a lower electric rate and took advantage of this opportunity. The CHP system operated:

- 24 hours per day
- 4 ½ days per week
- 5,616 hours per year
- Experienced minor interruptions for service and repairs

The CHP system was an integral part of the facility's total energy conversion system.

CHP
Project
budget at
\$1.4 M,
actual
installation
cost under
\$1.2 M

PROJECT INSTALLATION

- The CHP project was originally budgeted at \$1.4 million. The final installation cost of the CHP system was \$1.2 million, an amazing feat.
- The key to the project's success was the proper engineering and the minimal amounts of problems that occurred during installation and start-up.
- Additional factors for the lower installation cost was the use of an under utilized utility garage to house the two motor generator sets along with the operating controls and heat recovery equipment.
- Power generating equipment was also installed only 50 feet from hospital's switchgear equipment



\$41,246
Maximum
monthly
savings



ADDITIONAL FACTS

- Maintenance and repair costs were under contract by Patten Power Systems
- LaSalle Associates, Inc. was the turnkey design and installer
- CHP system reduced toxic pollutants with an efficiency between 85-90% compared to the standard utilities generating electric power at 35% wasting great amounts of excess generated heat
- Absorption chiller utilized waste heat during the summer

Overall
efficiency
between
85-90%
compared
to utility
efficiency
of 35%

For further information contact

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