

Catholic Hospital Koblenz

Germany has one of the highest electricity costs (per kilowatt) among industrialized countries and territories, and is ranked seventh in the world for energy consumption. Because of this, in 2010, the country's officials instituted an aggressive policy to reduce emissions and increase use of renewable energy. Continuously planning ahead, the Catholic Hospital Koblenz began years in advance to replace the campus' aging boiler system.

Catholic Hospital Koblenz chose two Capstone C65 MicroTurbines® to meet its energy system criteria and reduce overall energy costs.

"We started to plan for a new central system (two years before installation) because we supply three other clinics as well," explained Christoph Edrich, Technical Director for the 210-bed hospital. "We realized that increased energy expenditures were needed. The idea came for a microturbine; that became our favorite due to low cost, special needs, and operating time."

The microturbines are used in a combined heat and power (CHP) system. In addition to producing onsite electricity, surplus heat generated while the microturbines operate is captured and used to preheat water delivered to new boilers the hospital purchased. Steam from the boilers supply building heat and hot water.

The C65s provide electricity, heating, and hot water to the three buildings on the campus and three additional clinics. The surplus heat generated is used to preheat the water that goes into the boilers for hot water production. Energy generated in the winter months by the pair of C65s accommodates the hospital's peak load requirements.



At a glance

Location

Koblenz, Germany

Commissioned

August 2010

Fuel

Natural Gas

Technologies

- Two C65 Capstone microturbines used in a CHP application.
- Two heat exchangers, each with 126kW thermal capacity.

Results

- Each heat exchanger provides 126kW of thermal power, generating an overall efficiency around 85%.
- Cogeneration system meets Germany's stringent requirements to lower energy use and reduce emissions.
- Nominal maintenance ensures the mission-critical facility has power when it matters most.



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*— Christoph Edrich, Technical Director,
Catholic Hospital Koblenz*

“In the summer months the turbines are running on their own and can produce enough total power for the hospital,” noted Marcus Mehlkopf, CEO of Capstone distributor E-quad Power Systems GmbH.

“Through the installation of microturbines the heating system can be completely shut off,” Edrich added.

“Our distributor, E-quad Power Systems, developed their own heat exchanger for this application,” said Sven Fransen, Capstone Regional Sales Manager.

“This allows them to have very high efficiency at high temperatures to meet the CHP requirements that apply in Germany.”

“With every heat exchanger we can get 126kW thermal power so we get an overall efficiency around 85 percent,” E-quad’s Mehlkopf said. Onsite CHP is far more fuel efficient and environmentally beneficial than utility power and boiler heating, and can dramatically cut monthly power bills.

Recognized as one of the leading countries for promoting sustainability, Germany has worked for more than 40 years to develop policies and initiatives that promote environmentally sustainable growth.

“Germany has high objectives to lower the energy uses and reduce emissions, very strongly encouraging new technology that do both,” Fransen said. “What they are focusing on is renewable energy, and also the much more efficient CHP units which Capstone offers with their microturbines.”

The system’s minimal maintenance and downtime has been a tremendous benefit to the hospital. “There are no wearing parts other than the turbine itself,” said Edrich. “Maintenance is once a year for two hours, otherwise the energy is here for us around the clock.” ■



Two natural gas Capstone C65 microturbines make up the combined heat and power system at Catholic Hospital Koblenz in Augsburg, Germany.