Capstone® Turbine Corporation
AUTHORIZED DISTRIBUTOR

PHOENIX CONTACT

AT A GLANCE

Location
Harrisburg, Pennsylvania, USA

Commissioned
January 2014

Fuel
Low Pressure Natural Gas

Application
Manufacturing/Office Building

Market Segment
Commercial Combined Cooling, Heating & Power

The Facility
- 370,000 square feet
- Space includes manufacturing, production, distribution, and engineering

Technologies
- C1000 Dual Mode Capstone Power Package
- Hot Water Heat Exchanger
- 300-Ton Exhaust-Fired Absorption Chiller
- (mTIM) PLC Control System

Output
- 1000kW Gross Electrical Capacity
- 5,100 MBH Gross Thermal Output
- 300-Ton Chilling Output

Results
- System provides backup power to entire facility to keep manufacturing operation in full production
- Generates baseload electricity, hot water, and chilled water
- CCHP carbon savings of approximately 3,130 tons – equivalent to removing 517 cars from the road per year

MANUFACTURING

Phoenix Contact, an international manufacturing company, prides themselves on their innovation and quality – two values that are a pivotal part of how they do business. Located in Harrisburg, Pennsylvania, the German-based company's United States headquarters manages manufacturing and logistics facilities for North and South America, manufactures industrial automation, interconnection, and interface solutions.

To meet the increasing needs and demands of their customers and to better suit the growing local workforce, the company chose to renovate its existing location and expand it to nearly double the manufacturing footprint. The company knew that with their expanded footprint, their outdated boiler would need to be replaced and sought an environmental option that could be implemented to meet their additional heating and cooling needs, as well as their increasing electrical demand and consumption. Phoenix Contact turned to Capstone Turbine Corporation's local distributor, E-Finity Distributed Generation, for a tri-generation combined cooling, heating, and power (CCHP) solution to generate enough electricity to power the company's newly enlarged space.

Innovation Through Collaboration

Jack Nehlig, President of Phoenix Contact USA, stated, "At Phoenix Contact, we realize we have a large energy footprint and have chosen to help our region and the world by making a significant investment to

generate our own power in a more environmentally friendly way."

Phoenix Contact's clean-and-green investment comes in the form of a CCHP system composed of a Capstone C1000 Power Package, which contains five Capstone 200kW microturbines packaged into a single ISO container, a 300-ton exhaust-fired absorption chiller, and a 5,000 BTU hot water heat exchanger. The thermal dynamics of the building drive the microturbine and are capable of generating up to 1MW of electricity, enough electricity to power the entire facility approximately 65 percent of the time.

Running on low-pressure natural gas, the tri-generation system also provides heating and/or cooling to the entire facility. As the turbines generate energy, they vent the waste exhaust heat through either the building's absorption chiller or heat exchanger to regulate the building's chilled and water supplies. That demand will determine how much electricity the system will generate, while reducing the amount of water Phoenix Contact uses.

"I am very pleased to see that the commercial/industrial marketplace is recognizing the value that can be gained from utilizing low-cost, abundant natural gas for generating reliable onsite combined cooling, heating, and power (CCHP) with Capstone microturbines," said Jeff Beiter, Managing Partner for E-Finity Distributed Generation.

E-Finity's PLC-based control system (mTIM) remotely monitors the system and records key energy production data between the plant and the building's automation system to boost thermal priority performance. The mTIM allows E-Finity's customer service department to not only remotely monitor the facility, but diagnose and troubleshoot the system 24/7. This also means that E-Finity can fix the system without being onsite, minimizing downtime and maximizing uptime for the end user.

The Capstone tri-generation system provides the facility with baseload electricity, hot water, chilled water, and backup power in the event that the local utility goes down

The CCHP system provided Phoenix Contact with two key benefits. Not only were they able to take advantage of local and state incentives, but, with the installation of the system in January 2014, the company expects to see an estimated annual savings of over $300,000 per year, with a return on investment of under six years. Additionally, the system acts as a redundant source of electricity, which will allow the facility to operate in the event of a natural disaster where either the local utility or the CCHP system goes down. ■