

Benz Research & Development

Manufacturing

The Challenge

For over 30 years, Florida-based Benz Research & Development (BRD) has been a leader in optical polymers, using research, development and manufacturing to advance the art and science of contact lens & intraocular lens (IOL) materials. Ten years ago, the company invested in its first combined cooling, heat and power (CCHP) system to gain power redundancy by generating on-site electricity, and simultaneously harness the waste heat to for the plant's cooling and heating needs.

In 2019, BRD partnered with E-Finity Distributed Generation, to upgrade its existing Capstone CCHP system in support of its three ambitious goals: (1) Accommodate increased demand for power due to growth in manufacturing. (2) Expand the company's commitment to social responsibility through environmental improvements. (3) Provide reliable and redundant power for the plant to stay operational, even during power outages in the hurricane-prone region.

The Solution

The upgraded system was built around a Capstone C200S, which replaced an existing array of C65 microturbines that had successfully operated for a decade, but were outdated.

Like its predecessor, the C200S microturbine is operated in a CCHP configuration, generating on-site electricity and recovering waste heat to power two 30-RT, hot-water-fired



Benz Research has always been environmentally conscious. By using CCHP, we not only reduce our purchase of 'dirty' utility power, but we also recover the exhaust waste heat and energy for useful purposes, and thus, reduce our carbon footprint and reduce global warming."

— Rakesh Vasant, Manager of Plant Operations
Benz Research & Development

Power Profile

Customer

Benz Research & Development

Location

Sarasota, Florida

Commissioned

April, 2019

Fuel

High Pressure Natural Gas

Technologies

- C200S Capstone Microturbine
- 2 30-ton Hot Water Absorption Chillers
- M-Tim PLC Controller

Capstone Green Energy Distributor

E-Finity Distributed Generation



**Smarter Energy
for a Cleaner Future**



A C200S microturbine is operated in a CCHP configuration, generating on-site electricity and recovering waste heat to power two 30-RT, hot-water-fired absorption chillers that base load the plant's heating, ventilation and air conditioning system.

absorption chillers that base load the plant's heating, ventilation and air conditioning system. Integrating their customized heat recovery system with the plant's Building Management System, BRD has been able to boost thermal efficiency for the fuel used for C200S, resulting in substantial savings in the cost of energy and simultaneously reducing their carbon footprint.

To maintain reliability and optimal performance of their C200S, Benz contracted with E-Finity for a 7-year Factory Protection Plan (FPP). The plan provides remote monitoring, and facilitates prompt response and immediate alerts of any problems with the equipment, as well as ongoing diagnostics, plus planned and unplanned maintenance needs.

The Results

Through CCHP, waste heat from C200S produces an additional 60 refrigeration tons (RT) of space cooling, which offsets the need for an additional 70 kilowatts (kW) of electric power. The configuration also boosts the overall thermal efficiency of the system to over 75%.

But the most valuable aspect of the system is that it provides redundancy of reliable power, which allows Benz to remain operational, even during power outages. This resiliency sets them apart from the competition and boosts customer confidence in Benz's ability to deliver products on-time and meet expectations.

"Manufacturing at this level of precision requires reliability of clean power. Over the years, the existing system has allowed us to sustain operations during several adverse weather challenges, allowing us to maintain the trust of our customers," said Rakesh Vasant, Manager of Plant Operations for Benz Research & Development.

An added benefit of the system is that it has only one moving part and no need for spark plugs, oil changes or antifreeze. The system is virtually maintenance-free and requires only 1-2 hours of service for every 8,000 hours of run time. For a site like

Benz Research, that amounts to roughly every 10-12 months of continuous service.

High efficiency and low maintenance are only some of the ways that BRD has been able to achieve cost savings. Previously, the company used CCHP to offset peak electricity rates, but with the upgrade, Benz Research was able to negotiate favorable rates from two natural gas providers. All factors considered together, the plant is able to realize savings of roughly \$60,000 every year. And thanks to the FPP, system reliability is extremely high with an average uptime of over 99%.

To further address the company's environmental goals and reduce their carbon footprint, Benz is planning to expand its use of solar panels with a highly efficient, 200 kW solar-panel carport. When accounted for with the environmentally friendly CCHP system, the upgrades to the site will allow it to be virtually carbon-free.

Capstone C200S Microturbine



A C200S Microturbine provides up to 200 kW of electrical power and contains the world's largest single-unit air bearing microturbine.