

# Machland Fruit and Vegetable Delicacies GmbH

The antiquated production plant for Machland Fruit and Vegetable Delicacies GmbH, along with severe grid failures, threatened to spoil the fruits of the company's labor. The prominent producer of over 10 gourmet fruit and vegetable specialties knew a secure and efficient energy system was needed to continue to deliver products that met its high-quality specifications and extreme energy demand.

The plant – nestled in Naarn, Austria – produces an astounding 20,000 glass-packed products each hour and 120,000 bags of product daily. This high volume production requires vast amounts of continuous power to operate its extensive network of processing and packaging equipment.

"The energy costs of our products are very high and our plant equipment was outdated," explained Andreas Kirsenhofer, Technical Plant Manager at Machland. "We searched for a combined solution of turbines and a steam boiler to save energy costs."

With the capacity to generate 200kW of electricity, a Capstone C200 MicroTurbine® was installed in a combined cooling, heat, and power (CCHP) application to reduce energy costs and the plant's reliance on erratic local grid power, which failed on average twice a week.

"Machland wanted to install a new steam boiler system for its production," said Franz Weixelbaumer, Astebo Sales Manager. Astebo is the manufacturer of Machland's primary boiler and worked closely with Wels Strom GmbH, the region's Capstone distributor to design and build the new facility enhancement. "The production of steam did not provide enough energy efficiency, so we decided to establish an overall



## At a glance

### Location

Naarn, Austria

### Commissioned

May 2010

### Fuel

Natural Gas

### Technologies

- One C200 Capstone microturbine in a CCHP application.
- Absorption chiller.
- Heat exchanger.
- Steam boiler.

### Results

- The cogeneration facility generates 200kW of electricity annually.
- Stand-alone application and CCHP system together reduce electricity costs.
- Energy efficiency ranges from 90%–96%.
- System utilization is greater than 40%.
- System's exhaust heat warms on-site steam boiler that heats anaerobic digester to break down food waste.
- Site received two distinguished awards based on efficient and sustainable use of resources and energy.

concept including the production of electricity and waste-heat utilization.”

The Capstone C200 today anchors the plant’s highly efficient power system that provides electricity, heat, and cooling to the facility. Efficiency is further boosted because excess heat from the C200 is also fed to the plant’s steam boiler.

With more than 17,000 tons of raw fruits and vegetables processed annually, carefully managing food waste from the production process was vital. The solution rested in the updated power system. Machland’s steam boiler replaced an old boiler installed in 1979.

“The Capstone microturbine produces electrical energy, and the exhaust is used as combustion for a steam boiler,” said Leopold Berger, Wels Strom GmbH Head of Energy Systems. “Using the hot oxygen-rich microturbine exhaust as a boiler combustion feed provides the energy required. It is highly efficient.”

When the town of Naarn experiences cold temperatures, recovered heat from the plant’s pasteurization process and waste heat from the C200 produces hot water through a secondary heat exchanger that supplies heat to the warehouse and office. On hot days, an absorption chiller uses the microturbine’s waste heat as energy to produce cool water for air conditioning.

“We considered installing a gas engine at first but it turned out we could not use the heat the way we wanted,” Kirsenhofer noted. “An additional benefit with the Capstone microturbine was the option to operate in stand-alone mode in case of grid failure.”

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*— Leopold Berger, Head of Energy Systems,  
Wels Strom GmbH*

Given the plant’s history of operating in extreme summer heat and experiencing utility power failures that averaged twice a week, it was critical to the Machland team that its new power system be able to operate off the local grid.

“If grid failure happens during production, food cannot be tinned and that costs a lot of money,” Berger explained. “For that reason, the Capstone dual-mode solution is perfect for Machland’s requirements. In case of grid failure the stand-alone application allows the completion of production and saves waste.”

With reduced energy costs, increased efficiencies, and less reliance on an unstable utility grid, the gourmet food manufacturer has capitalized on the benefits of the Capstone C200 microturbine. “High fuel efficiency is achieved while maintaining a high turn-down ratio,” said Berger. “With a system utilization greater than 40 percent, we see overall efficiencies from 90 to 96 percent.”

The system’s benefits to the country’s ecosystem have not gone unnoticed. “We are very successful with our project,” Kirsenhofer said. In 2010, the system received two environmental awards. The Austrian Federal Ministry of Agriculture, Forestry, Environment, and Water Management bestowed Machland the “klima:aktiv” award for its advancement of the Climate Protection Initiative (CPI). The CPI program fosters a competitive low-carbon economy based on efficient and sustainable use of resources, protection of the environment, and the establishment of innovative green technologies and production practices.

Additionally, Machland received recognition from its state (Upper Austria) which awarded the company the Upper Austria regional prize for environment and nature for its careful and innovative use of energy. ■



*A Capstone C200 microturbine installed in a CCHP application generates electricity for the Machland food manufacturing plant.*