

The Challenge

In 1980, a small family of pasta makers started Laboratorio Artigianale Tortellini, a company that made fresh pasta for the retail market. When it came time to expand the business, their two main goals were to produce enough pasta to meet the growing demand and to adopt a deep freezing method for preserving their products. After implementing several successful strategies to grow the business, the company eventually changed its name to Surgital – a combination of the Italian word “surgelato,” meaning deep-frozen, and its geographic location; Italy.

As the market for quality frozen pastas and meals grew, so did the demand for Surgital’s products. In 2010, the pasta company opened a trigeneration plant to start producing its own energy and reducing its environmental impact. Over the next couple of years, expansion grew to the point where further improvements were needed to the company’s onsite plant – improvements that would reduce energy costs, allow for flexible growth and meet Surgital’s commitment to environmental stewardship.

The Solution

In an effort to improve the existing trigeneration plant, Surgital turned to IBT Group, Capstone’s Italian distributor, for a solution that could produce electrical and thermal energy for increased production and storage purposes. In the summer of 2014, a natural gas-fueled C600 microturbine was installed in grid connect, along with an ammonia absorption chiller and steam generator system.

Capstone microturbines produce a large volume of clean and oxygen-rich exhaust which can be used as the primary combustion air in a steam generation system. Clean exhaust from the steam generator is captured via heat exchanger to make hot water for the building, further boosting the overall system efficiency to over 90 percent. The 600kW microturbine at Surgital allows the customer to generate their own electricity, steam for pasta making as well as hot and chilled water.

Power Profile

Customer

Surgital

Location

Ravenna, Italy

Commissioned

July 2014

Fuel

Natural Gas

Technologies

- Capstone C600 Microturbine (CCHP)
- Hot Water Heat Exchanger
- Steam Generator with Duct Burner
- Ammonia Absorption Chiller and Cooling Tower

Capstone Turbine Distributor

IBT Group



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— Edoardo Bacchini, Managing Director Surgital



The Capstone C600 system produces heating, cooling and steam for Surgital's new storage warehouse.

The exhaust gases released by Capstone's C600 microturbine have an oxygen (O₂) content of about 18 percent and can be used as primary combustion air into a natural gas burner or post-combustor. The C600 microturbine releases enough exhaust gases to burn 147 Sm³/h of natural gas inside the post-combustor, raising the exhaust gas temperature to 600°C (1,112°F). The exhaust gases are then driven into a steam generator that produces 3000 kg/h of saturated steam at 8 bar. The steam produced is also fed to an ammonia chiller to produce chilled water at -30°C (-22°F) for the company's large, automated cold storage warehouse, which has a holding capacity of 14,000 pallet slots.

"This new post-combustion steam production application reinforces our market presence within the Italian food and beverage industry and creates an important reference for other key industrial practices that use steam for their production processes," said Ilario Vigani, IBT Europe GmbH president. "There is a wide assortment of businesses in Italy that can benefit from this application in terms of cutting their primary energy costs by 30 percent or more."

The Results

The updated trigeneration plant at Surgital has since provided a favorable payback by reducing the customer's utility costs to about €180,000 per year of operation with an energy savings of 200 TOE (tonnes of oil equivalent) per year, which translates to approximately 563 tons of CO₂ avoided. The overall efficiency of the manufacturing facility has improved by 30 percent and continues to run quietly and efficiently year round.

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consequent decrease of the social costs of pollution, but above all from the need to increase our competitiveness," said Edoardo Bacchini, Surgital's managing director. "A key aspect for a company like ours, which is growing abroad, is entering new regions with energy costs lower than the Italian utility. Capstone helped us to achieve this important goal, reducing production costs and thus increasing our strengths within new markets."

Additional contributing factors of the trigeneration plant improvement include economic incentives such as the White Label energy saving program that encourage clean and efficient energy production for retail providers. Today, Surgital produces about 135 tonnes (297,624 lbs) of fresh pasta and other products per day and is poised to continue its positive growth and extend its geographic reach, all at a fraction of the cost and with fewer carbon emissions. ■

Capstone C600 Microturbine



The C600 provides 600kW of electric power with three air bearing microturbines, and can easily be deployed in CHP/CCHP applications.