

Reliable Heat Supply for Beautiful Plants

The highly efficient biogas plant in Oberspiesheim ensures needs-oriented heat supply for one of Bavaria's largest nurseries.



Most orchids are tropical plants that love warmth. To enable the heat-loving beauties to flourish, Gartenbau Gernert, one of Bavaria's largest horticultural enterprises, needs to ensure an even climate in its orchid greenhouses both in summer and in winter. Apart from the orchid cultivation, the company also needs energy for other purposes; other plants, too, need to be supplied with heat in winter and in cool nights.

To enable Gernert's plants to flourish, the neighboring biogas plant in Oberspiesheim makes use of state-of-the-art engine technology to efficiently produce heat and power from plant substrate. The biogas plant covers about 60 percent of the nursery's total annual heat demand. This corresponds to approximately 1 million l of fuel oil.

In late 2017, the biogas plant in Oberspiesheim, which had been set up back in 2006, was supplemented with a new container-housed cogeneration power plant with an efficient MWM TCG 2020 V12 genset. The objective of the expansion was to increase the plant efficiency for needs-oriented power generation. "From our perspective, the incentives for the normal operation of biogas plants have increasingly deteriorated in recent years", observes Bernhard Bedenk, Director of Bioenergie Oberspiesheim. "For this reason, we wanted to implement a cogeneration power plant that would enable flexible needs-oriented power generation."

New Engine Chosen by Our Employees

"The new gas genset, which represents the core of the plant, was actually chosen by our employees on site, whose opinion we had asked for. After all, the decision in favor of a certain engine also takes the good service and support into consideration, which are provided in the background", he says, explaining why they had opted for the MWM TCG 2020 V12. "What is more, the engine's fast ramp-up capability is important for efficient flex operation."

The genset heat from the power generation from biogas is fully used by the neighboring nursery. The power is fed into the grid of Überlandwerk Mainfranken. "We are very proud of the high efficiency of our biogas plant", says Tino Scheithauer, also Director of Bioenergie Oberspiesheim. "For example, we use the exhaust heat emitted from the parts of the cogeneration power plant to dry wood chips. Furthermore, we use the usually untapped energy of the low-temperature mixture cooling circuit to heat our digesters."



Bernhard Bedenk, Managing director
Bioenergie Oberspiesheim

Elaborate Conversion

With its biogas plant, which is capable of delivering heat and power as needed, Bioenergie Oberspiesheim is a pioneer in the region. “The optimum heat utilization for improved plant efficiency is a challenge for biogas plant operators”, explains Bernhard Bedenk. “The conversion of our plant from normal operation to flexible operation was elaborated and required the expansion and adapted heat management of the storage units.” This necessitated intensive collaboration with the customer. Nevertheless, Bedenk feels that the effort and investment have been worth it: “When the carbon levy comes, our biogas plant will be what ensures the nursery’s economic feasibility.”



Bioenergie Oberspiesheim

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Technical data CHP

Go-live: December 2017

Plant builder: Caterpillar Energy Solutions GmbH

Genset type: MWM TCG 2020 V12

Generator: Marelli

Gas type: Biogas

Control: TEM

Substrate: Manure, chopped green plants, maize, sugar beet share to be increased

Gas storage: 11,000 m³

Heat storage: 360,000 l

Thermal efficiency: 41.8 %

Electrical efficiency: 42.5 %

Thermal output: 1,179 kW

Electrical output: 1,200 kW

Total efficiency: 84.3 %



All photos: ÜZ Lültsfeld

Nothing Remains Unused

The biogas plant in Oberspiesheim is highly efficient, which has also been confirmed by Bavarian environmental assessments. To use all energy forms as effectively as possible, the process heat of the low-temperature mixture cooling circuit is used as auxiliary energy for the digestion process (digester heating). These 89 kW of thermal energy thus do not need to be extracted from the district heat network. Thanks to this concept, the biogas plant is able to produce its heat energy very inexpensively.

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