



AN ECONOMICAL AND ECOLOGICAL MASTERPIECE

UTS BIOGAS PLANT PROJECT - ROSENÖGGER & SANDER

The thermal baths in Bad Sassendorf are a magnet for visitors. Each year, around 300,000 visitors take the opportunity to spend a „day by the sea“ in the facility’s salt water pools, saunas or salt caves. A comprehensive investment has been made recently in restoring the facility to increase its appeal even further.

Visitors are able to enjoy a pleasant, all-year-round temperature of 33°C in five salt water pools (two indoors, three outdoors). The extensive sauna amenities include no fewer than seven different saunas.

So it’s understandable that the overall heat energy requirements are high. To operate in an economically and ecologically effective and sustainable manner, the operator decided in 2009 to switch from using its own boilers to using CHP plants powered by biogas. Initially, a cooperation partner was found in an agricultural company from the nearby town of Heppen which met all of the preconditions for operating a powerful biogas plant. Following this, neighbouring farmers Harald Rosenögger and Achim Sander founded Biogas GmbH & Co. KG. This opened up new prospects for the pair to add another strand of business to and therefore to diversify their farming operations.

WHO IS BUILDING THE PLANT?

This question was put out in 2009 and was answered through a tendering process, at the end of which we got the green light for our concept. According to the customer’s statements, a whole series of points that worked in our favour were crucial for this decision: A good plant concept, impressive references from Bavaria and good examples from the nearby region that had been built previously. Components such as ZPS solid feed, service boxes and conveyor belt technology, as well as the high-quality constructions and UTS pipeline installation. And last but not least: the UTS office in Lippetal.

Construction of the first section began in the spring of 2010, and by the end of 2010 the CHP was set up at the thermal baths and the whole plant commissioned. To begin with, this is how it looked: At the yard on Heppen’s Kampstrasse, we built a fermenter with a volume of 2,280 m³ (diameter 22 m, height 6 m) with an insulated concrete roof and two UTS service boxes with hydraulic mixer technology. Added to this was a fermentation product store with a volume of 4,850 m³ (diameter 32 m, height 6 m) and an inflatable film cover. Between the fermenter and the fermentation product store, we created space for the pump technology (UTS ZPS DRP 4000 pump) with distributor, a gas analysis device and control system. Other system components: a preliminary tank for slurry delivery, gas cooling with gas pressure increase for the micro-gas pipe and a woodchip heater (200 kW) to heat the fermenter.

POWERFUL PERFORMANCE FROM THE START

From the commissioning stage, Rosenögger & Sander supplied biogas via a 3.5-kilometre-long micro-gas network for the operation of two CHPs at the sites of the thermal baths (370 kW) and Quellenhof Clinic (180 kW) in Bad Sassendorf. The local arrangement of the CHPs has the advantage that up to almost 100% of the heat generated is used.

All in all, this means that the plant, as an overall concept, is achieving peak standards both from an economical and ecological perspective with the highest degree of efficiency. With the significant savings in terms of energy costs, a lot of CO₂ is also being saved. Ultimately, the plant adds up for everyone involved - including nature.





EXPANDING THE SUCCESS

BUILDING SECTIONS II AND III

In the years that followed directly afterwards, 2011 and 2012, we were able to expand the overall concept and take its performance to an even higher level with repowering.

At the therapy centre in Bad Sasendorf, the customer built a further CHP with an output of 370 kW. To cover the gas requirements, the biogas plant in Heppen had to be expanded with a post-fermenter made from insulated reinforced concrete with a capacity of 3,700 m³ (diameter 26 m, height 7 m). Our UTS service box with its intelligent mixer technology was used here too. And then in 2012, in stage III of the construction project, an additional fermentation product store was built in Achim Sander's yard.

EFFICIENT REPOWERING

To handle the increased overall energy requirements of the thermal baths, the Quellenhof Clinic and the therapy centre, the outputs of the individual CHPs were increased to 400 kW (previously 370 kW), 220 kW (previously 180 kW) and 400 kW (previously 370 kW) respectively. The amount of biogas produced accordingly also had to increase.

Together with Rosenögger and Sander, we developed targeted repowering measures to make better use of the substrate used (12,500 t of corn silage, 2,500 t of pig manure, 2,500 t of cattle manure, 1,000 t of dried



Servicebox Pro with biogas recuperation



Pumps and distributors with intelligent substrate processing

chicken dung and 4,000 m³ of pig slurry). The measures in detail: To begin with, we optimised the flow, pump and mixing behaviour in the fermenter by chopping up the fermenter substrate with Rotocut and a feeder screw displacement pump. The focus here was the reduction in size of the fibres, which would float to the top. We also integrated further intensive chopping via a Gorator. All in all, the measures resulted in the biogas yield from the substrate volume being significantly increased. With the capacity gained, we were able to achieve the reserves needed to drive the CHP's electrical output of a total of 1,020 kW all year.

KEEPS ON RUNNING

For us, this project is an excellent example of what can be achieved with good concepts and ideas in combination with powerful, high-quality technology. The original 550 kW plant was expanded simply through the addition of a post-fermenter and targeted repowering to a total capacity of 1,020 kW with virtually 100% heat consumption. And all this with comparatively low investment costs. By the way: since the overall plant started running in 2010, the biology has always worked perfectly, the containers have not yet been emp-

ty tied and there has been no major damage.

The comment from Achim Sander is unsurprisingly positive: „We are extremely satisfied with the UTS technology in our plant. It offers us plenty of reserves and works with total reliability. The high performance of the new 3D mixer propeller in the hydraulic mixer system is especially pleasing. It saves a noticeable amount of energy when the substrate is being mixed in the fermenter.“

For us, the project showed what can be done and how energy can be utilised as best as possible from sustain-

able raw materials. In Rosenögger & Sander we had a customer who put a lot of trust in us, and who worked very well with us throughout every stage of the project. Ultimately, we are delighted that we were able to pave the way for sustainable heating at the Bad Sasendorf thermal baths. We hope that all of its visitors enjoy their „days by the sea“. ■



Matthias Rosenögger and Achim Sander