

Quarnbek

Biogas plant based on manure and energy crops

Established in 2007

Quarnbek biogas plant is situated at Quarnbek manor in Schleswig-Holstein in Northern Germany.

Quarnbek manor

Quarnbek manor is solely engaged in arable farming with 1,000-1,200 ha of cultivated land. The energy crops for the biogas production are cultivated on approx. 180 ha. Apart from their own energy crops a smaller amount of cow manure from the neighbouring farms is added to the biogas plant.

Biogas and energy production

Quarnbek biogas uses 5 tons manure, 25 tons maize/GPS silage and 1-2 tons chicken manure on a daily basis. 95 % of the total gas production comes from the added silage. The biogas facility is a so-called NAWARO plant, which means that only agricultural material such as manure and energy crops are used.

By running the plant as a NAWARO plant the owners are awarded a



bonus in the price of the electricity sold to the grid as well as a bonus if the surplus heat from the plant is utilised.

The digestate

After the biogas process the digestate can be used on the land as a fertilizer. The digestate has a relatively high content of ammonium-N, which is easily absorbed by plants.

Optimum process temperature

The biogas plant is designed with one primary steel digester with an operating temperature at 50°C and one secondary digester with an operating temperature at 37°C. As silage degrades slowly the plant operates with a retention time of 50 days in the primary digester and 90 days in the secondary digester.

In total there is a very high exploitation of the biomass, which by far exceeds similar NAWARO plants. The methane gas (CH₄) is used in a gas engine with a heat efficiency of 50 % and electrical efficiency of 40 %.

Xergi's experience shows that en-

ergy crops are very suitable for the high process temperature.

This experience with high process temperature has built a solid basis for establishing biogas plants with a high, stable gas production and a healthy operational economy. The plant in Quarnbek is built based on this know-how.

The owner, Christoph Schöller, states: "With the construction of this biogas plant I have decided to invest in the future of the farming industry and have thus become an energy supplier. It was not an easy decision for me, but today I am convinced it was the right thing to do for my business".



Technical data

Gas production:	1.9 mill. m ³ /yr
Power production:	4.3 mill. kWh/yr
Biomass:	8,700 tons/yr
Digester capacity:	
Primary digester:	1,500 m ³
Second digester:	3,000 m ³
Final storage:	3,000 m ³
Gas engine:	536 kW _e
Boiler:	500 kW _{th}

