

First Biogas International AG

The References

Biogas plants, object #188, Manure and corn straw/silage; Naumburg, Germany



The "Naumburg" biogas plant, Naumburg, County Sachsen-Anhalt, Germany

The "Naumburg" biogas plant was commissioned and set into operation in 2009. It is a modern biogas plant which is specializing in treating and processing mostly fibrous materials like wheat and rye straw, corn straw/silage and manure. The pretreated biogas is transferred to several CHPs via an extra gas pipeline to the city of Naumburg. There are about 21'000 tonnes of manure (7'000 t/a) and straw/silage (14'000 t/a) digested per year. The electricity production per year is about 7'000 MWh.

Plant layout

The biogas plant consists of two parts: the pretreatment part including the hydrolysis unit and the digestion part.

The hydrolysis unit



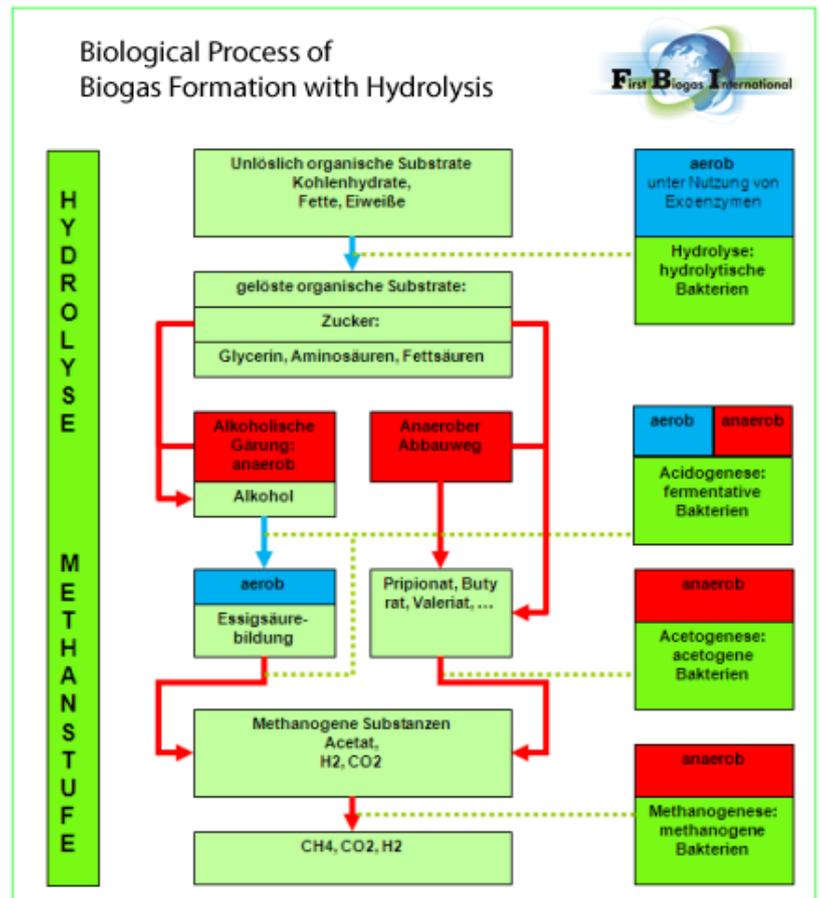
There is a straw/silage storage with 6'000 m³ volume. Manure is delivered directly into the hydrolysis unit (200 m³) where it is mixed with the straw/silage that is being chopped and fed automatically into the unit. The unit is heated up and there's an aeration system to support the formation of enzyme building bacteria to turn the cellulose into glucose.

The hydrolysis unit provides a mixed aerobic/anaerobic biocenosis to stir different processes:

1. Support aerobic bacteria to produce enzymes to turn cellulose into glucose
2. Support the anaerobic ethanol production
3. Support the aerobic formation of acetate

The advantages of the hydrolysis unit are:

- High biogas yield for cellulose rich feedstock (straw, grass, husks, leaves, etc.)
- Low hydraulic retention time in the digester (20 days instead of 60 days)
- Low energy consumption for agitating
- Easier pumping (no clogging)
- Possibility of recovering the heat of the outflow of the digester
- Higher methane content
- Easier plant operation and higher plant stability thanks to the feeding of acetate
- Using low quality feedstock is no problem (even silage with fungi)
- Detection of inhibitors (antibiotic) is possible
- Changing the feedstock is quickly possible



The digestion part

There are two digesters of 1'884 m³ net volume each. The digesters are running at about 43°C. They are fully insulated and have a steel tube heating system which is mounted on the inner walls. On top of the digesters, there are gas storages mounted. From there, the raw gas is cleaned and dried and most of it is transferred via an extra gas pipeline of 6.7 km length to the city of Naumburg and is burned in two CHPs (366 kW_{el} each) to produce electricity and hot water. One CHP is on site (190 kW_{el}) to supply the biogas plant. The outgoing digestate is stored in two tanks with a total volume of 8'000 m³.