



HEILIGENGRABE BIOGAS PLANT CONVERSION FROM ELECTRICITY TO BIOMETHANE

The main objective of this project is to convert the Heiligengrabe biogas plant from an electricity generation facility into a biomethane feed-in plant. The biogas plant comprises two connected fermentation sections (lines), each containing two fermenters, a post-fermentation tank, and a gas-tight digestate storage facility. The operator is Loick Bioenergie GmbH and plant currently mostly utilizes energy crops.

The task of Krieg & Fischer engineering team includes modernization of existing plant to process different substrate mix and increase biogas production, construction of new solid entry, separation, piping, design of new biogas upgrading including raw gas pre-treatment and regenerative thermal oxidation and new CHP for self-energy supply.

The biogas plant will be redesigned to utilize less energy crops and more manure, achieving CO₂ savings. The amount of raw materials will be increased from 45,000t/a to 65,800t/a (cattle and chicken manure, separated digestate, maize silage) and biogas production is expected to rise from 6.86 million to 7.93 million cubic meters per year (905 Nm³/h).

Biogas is mostly used to produce biomethane which is fed into the natural gas grid. Part of the biogas will be utilized in the CHP unit generating heat and electricity for the fermentation and upgrading facilities. The waste heat from the CHP and the biogas upgrading process will be harnessed to heat the fermenter and post-fermenter.

PROJECT DATA

- Location: Heiligengrabe, Brandenburg (Germany)
- Start of operation: 2024

UNIQUENESS OF THE SOLUTION

- Gas production 905 Nm³ of biogas per hour, 7.9 million m³/a
- CO₂ savings by change in substrate mix
- Two fermentation lines, separate feeding for solids and pumpable raw materials
- Modernization of existing biogas plant and switch from electricity to RNG production
- Raw gas pre-treatment and regenerative thermal oxidation (according to local regulation, methane emitted must not exceed 0.2% of the methane in the raw gas)

For more information:

- www.kriegfischer.de/en/
- contact@kriegfischer.de





VELEN BIOGAS PLANT - INTEGRATING EXISTING FACILITIES INTO EXTENDED RNG PLANT

Following take-over of former nutrient processing plant with a biogas sub-area, Bioenergy Velen GmbH is now investing into biogas and RNG plant. Based on the preplanning provided by the client, Krieg & Fischer engineering team is contracted to realize their vision, integrating the existing facilities into the newly designed system.

Biogas/RNG plant Velen will be expanded with a new filling and fermentation line, new central pump station, wood chip heating, biogas treatment and upgrading plant. Although initially built for manure treatment at a capacity of 200,000 t/a, the plant is now equipped and designed to process combination of different input materials.

The core of the new fermentation line are two steel fermenters, each with about 9,550 m³ net volume and about 21 m height, with top mounted agitators. These are followed by two newly-constructed secondary digesters of the same volume. Flat tanks from the old plant will now be used as substrate and digestate storage with gas holder roofs and emission reduction covers. Additional extension with new digestate storage tanks and external gas storage is planned.

The initial input is calculated at approx. 187,500 t/a, resulting in a gas production of about 1,400 Nm³ of biogas per hour. The layout and pipelines are dimensioned for further expansions and CO₂ liquefaction. To maximize biogas utilization for biomethane production, fermentation process heat is supplied through wood chip heating system. Biogas upgrading technology is pressure swing adsorption, with RTO heat recovery.

PROJECT DATA

- Location: Velen, North Rhine-Westphalia (Germany)
- Start of operation: 2023-2024

UNIQUENESS OF THE SOLUTION

- Gas production 1,400 Nm³ of biogas per hour with initial substrate recipe, current plant capacity is up to 1,850 Nm³/h of biogas/ 900 Nm³/h of biomethane.
- Repurposing and integrating of existing facilities into new RNG plant.
- Flexible substrate mixes with 200,000 t/a intake capacity, design allowing further extensions.

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