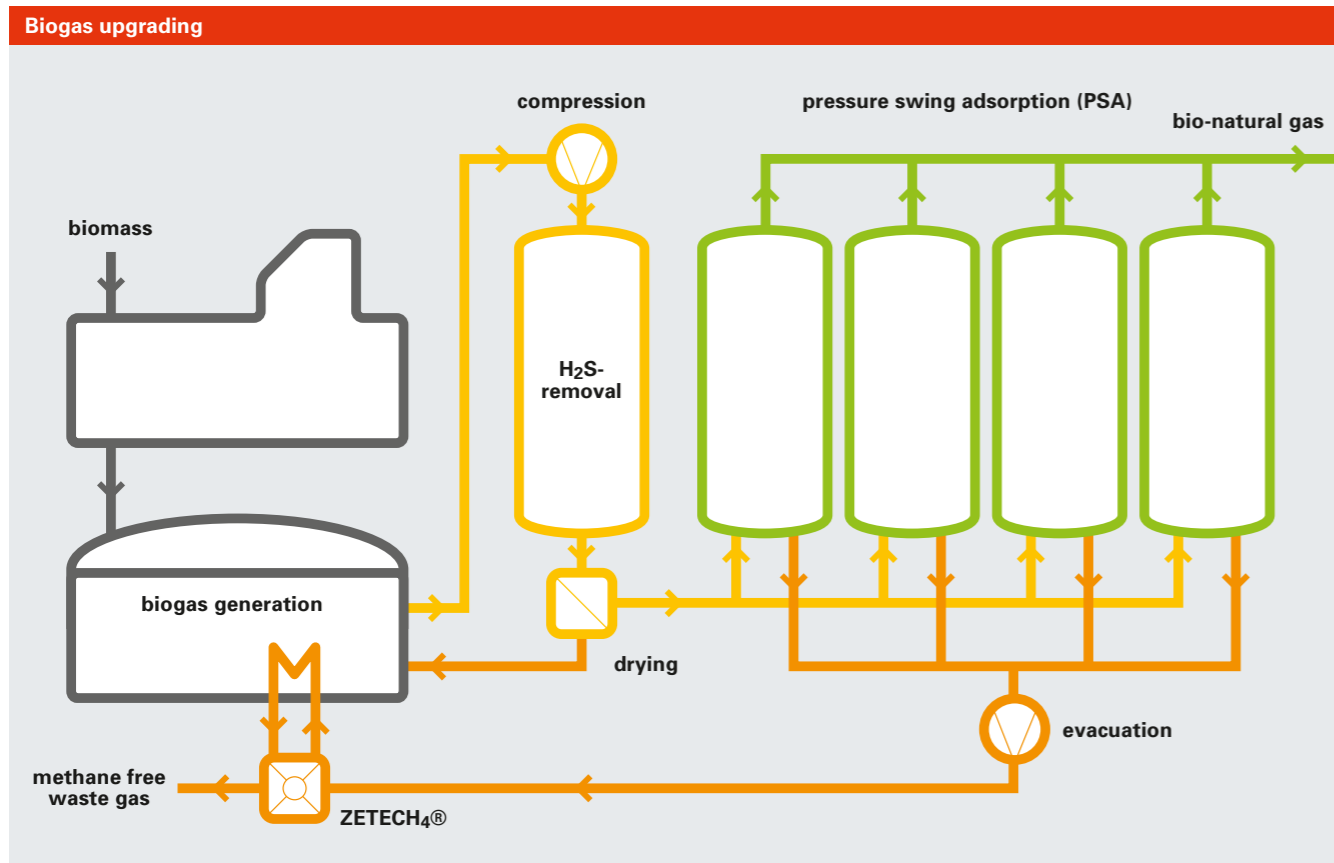


Adding value to your biogas     



Bio-natural gas generation and utilisation

Intelligent, efficient and eco friendly
by patented ZETECH₄[®]-process



The motivation

Fossil energy sources like coal, oil & natural gas are finite; the threatening shortage will lead within near future to dramatic negative effects – sustainable regenerative alternatives have successively to be implemented and established in the market – biogas seems to have the highest potential as substitute for natural gas. Fermentative generated biogas from energy crops, manure, municipal waste and/or other biomasses can be produced locally, safely, simply, efficiently and eco friendly.

Biogas upgrading to natural gas-equivalent quality and thereby use of the natural gas transportation grids is the precondition for a broad and energetically and economically optimal utilisation in decentralised cogeneration plants for power and heat, fueling stations for vehicles or heating systems in industry or households. Biogas generation as well as -upgrading are today approved, reliable, efficient and safe technologies.

Biogas upgrading by Carbotech-process

Process

pressure swing adsorption (PSA) by means of carbon molecular sieve and catalytic H₂S-removal

Raw gas capacities

up to 5.000 Nm³/h

Product gas purity

up to 99 % CH₄

Operating pressure

5 to 14 bar

Operating temperature

5 to 35 °C

Utilities

only power, ca. 0,18 to 0,24 kWh/Nm³ raw gas

Control unit

fully automatic, under load 30 to 100 %

Design

turnkey container system for outdoor installation

Standards

ATEX, CE, DIN, ISO, PED

Special performance

dry biogas upgrading process, i.e.

- no process water, no process water treatment
- no waste water, no waste water treatment
- no chemicals, no fresh water
- no corrosive gas atmosphere

Co-Adsorption, i.e.

- integrated drying/dew point < -40 °C
- partial removal of N₂ and O₂
- removal of silicon compounds as well as removal of higher hydrocarbons and CFC

optional:

ZETECH₄[®] (Zero Emission Technology)

- no CH₄-emission
- higher product gas recovery
- better overall efficiency
- compliance with international limits for methane emissions

The technology

The biogas generation according to Carbotech-process is just simple: The biogas is compressed and then first removed from H₂S by a catalytical active activated carbon followed by a moderate cooling to knock out water. This pretreated biogas is then streaming through one of four adsorbers filled with molecular sieve; here the impurities (CO₂, H₂O, H₂S, siloxane, NH₃, odours, partial N₂ & O₂ and other) are taken up as by a sponge and methane is produced. After certain time intervals it will be switched over to the next adsorber and the previous is then regenerated completely by vacuum. PLC-control and online CH₄/O₂-analysis ensure an automatic, reliable and safe operation.

Optional also the ZETECH₄[®]-system can be implemented; ZETECH₄[®] stands for „Zero Emission Technology“ and makes a world-wide unique biogas upgrading process without any CH₄-emission possible.

The result

Bio-natural gas – meeting the quality standards for natural gas.

- CH₄ > 96 %
- H₂S < 5 mg/Nm³
- H₀ > 10,5 kWh/Nm³

The cost

Due to high efficient and sophisticated, reliable and long-lived technology along with product standardisation and serial production biogas upgrading can be realised at attractive low cost, mainly impacted by the size of the plant.

Carbotech plants for biogas upgrading



BGA 1000



BGA 1000, biogas compression



BGA 1000, DWA

Practical examples

In practise there are several Carbotech plants for biogas upgrading in operation. Our company with its development and processes belongs international to the technology leaders.

Over 40 years experience aligned with newest results of research forms our basis for high-quality and economic solutions.