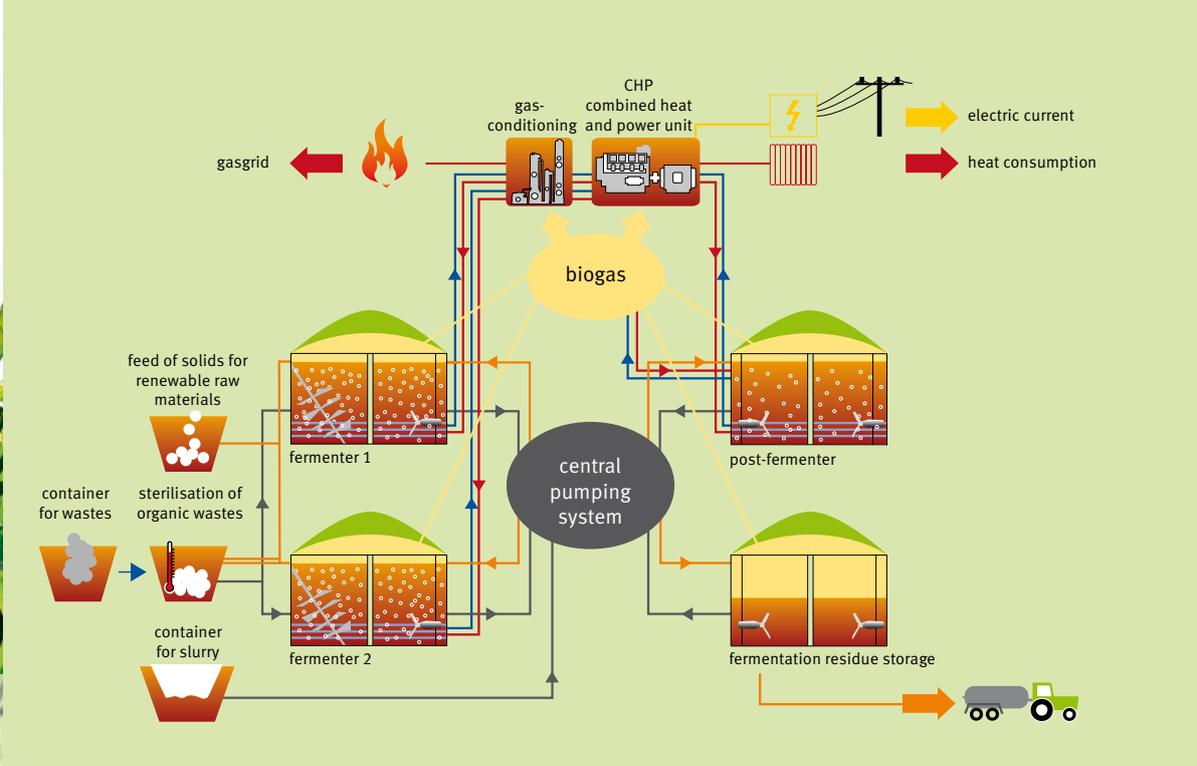




# Biogas –

economically, ecologically, guaranteed for the future



## The principle of biogas

In addition to hydro-electric power stations, solar generators, heat (and power) generation from biomass, and wind farms, biogas plants are one of the most important generators of electricity and heat from renewable energy sources. They are used to create biogas through the fermentation of biomass. Under anaerobic conditions, bacteria create a mixture of methane, carbon dioxide, and trace gases from the organic substances.

The substrates used in biogas plants are mainly animal excrements, such as slurry or solid manure, plus energy crops. For the technical production of biogas, the following are particularly suitable:

- specially cultivated energy crops (sustainable raw materials)
- agricultural dung (slurry, manure)
- fermentable residues containing biomass, e.g. sewage sludge, biological waste, or food waste.

With farm manures and fermentable residual materials containing biomass, the agricultural industry offers the greatest potential for the production of biogas.

The gas which results from fermentation is generally used on the spot in a CHP unit for the generation of electricity and heat. The fermentation residues which result as a by-product are used as manure.

A biogas plant consists of the following components:

- intake pit
- solids in-feed
- fermenter
- post-fermenter
- fermentation residue storage
- combined heat and power units (CHP)



## Good reasons for biogas

- Biogas plants reduce the carbon dioxide output by more than nine million tonnes each year, and thus make a significant contribution to climate protection.
- Biogas is a regenerative source of energy. Only sustainable, locally available raw materials are used for the creation of biogas. For this reason, fossil fuels are saved.
- Electricity and heat generation in a biogas plant is largely CO<sub>2</sub>-neutral, because the carbon dioxide released was previously bound up in the energy crops.
- Decentralised electricity generation can reduce supply distances to the end-user.
- Compared with other renewable energy sources such as wind and sun, biogas is a weather-independent, storable energy supply, and is, for example, suitable for covering peak loads.
- In contrast to electricity generated from wind and sun, electricity and heat are generated continuously in a biogas plant.
- Biogas can be used for the generation of electricity, heat, and in the form of purified methane, as a fuel for converted vehicles.

## Benefits for farmers

- In many cases, the construction of a biogas plant provides a good possibility to diversify agricultural production, and therefore income.
- Short transport distances for the biomass, closed nutrient cycles, regional value creation, as well as the creation and retention of jobs – especially in agricultural areas – are benefits of decentralised biogas use.
- For example, with a biogas plant, the methane which would escape from the open storage of slurry is not lost into the air; instead, it is used in the closed system for the creation of electricity and heat.
- The slurry is fermented in the biogas plant, and the nutrients which it contains are made better available for crops. The fermentation residue thus represents a valuable biological manure. Through the use of the fermentation residue in the field, farmers save themselves the application of artificial manures.



## What does Consentis offer?

Consentis has been active for more than 10 years in the planning, implementation, and maintenance of turnkey biogas plants. Internationally, we are among the leading full-range suppliers in the industry.

As an all-round service provider, the Consentis team supports you from the initial concept and development right through to plant commissioning and maintenance. In 2010, our team of experienced engineers, construction specialists, and project developers will have implemented more than 100 plants at home and abroad. Consentis supplies top-quality industrial biogas plants from experienced manufacturers.

As a dependable partner, we are by your side from planning, through implementation, to successful operation of your biogas plant. The details of our services include:

- consultancy
- planning and approval
- construction
- commissioning
- technical service and maintenance
- biological process support.



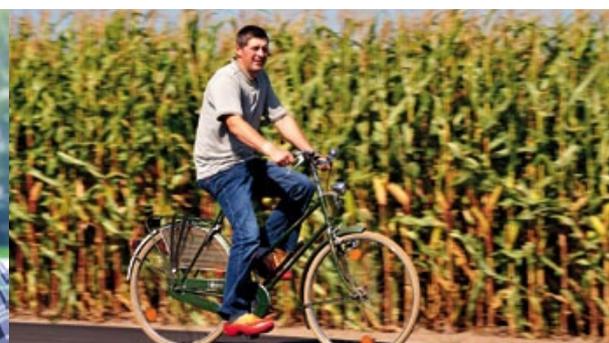


## Well supported in every way

Our team of engineers, building specialists and experienced experts provides intensive support. Our plants impress through high energy yield from diverse input materials. A long process duration increases efficiency, and makes it possible to use substrates which are difficult to ferment. Our plants operate at the highest possible availability and utilisation. In addition, there are very low maintenance costs. All these features secure our clients high added value, and provide a secure return for our investors.

Our advisory service offers you the possibility to inform yourself about the advantages and disadvantages of the planned investment. We also inform you about the different investment processes.

We will gladly prepare a non-binding proposal for the construction and operation of a biogas plant. On one hand are the investment costs for land and plant, running costs for operation, maintenance, and plant support, and the costs for connection to the public grid; on the other hand are the income from the sale of the energy, savings on heating, and the sale of heat and biogas to third parties.





## Tried and tested industrial quality

As a full-range supplier, we can offer you easy-to-run biogas plants for small upgradeable units up to 250 kilowatts, and large multifeed biogas plants up to the megawatt range. We are also active in the field of gas processing. We install your plant in accordance with proven industrial quality standards. All components have proven themselves reliable in continuous use, also in our own plants. We put our trust in mature process engineering, such as long dwell period, low digester loading, large fermenter volumes, and comprehensive gas storage.

The feed technology consists of high quality components that are adapted to the demands and requirements of the respective plant.

The mixing technology consists of a combination of large bladed agitation and submersible motor agitation equipment, which is made from stainless steel. Large blade agitation ensures vertical and horizontal mixing. It also operates slowly and saves energy. The formation of floating and settled layers is prevented by four pairs of blades. In addition, submersible motor agitators, adjustable on all sides, provide good mixing.

The central pumping system is so designed that pumping is possible at all times, independent of the direction. The elements of the heating system, made from stainless steel, are attached to the inner wall of the container.

Our reinforced concrete containers are manufactured with a braced formwork system, thus ensuring accurate manufacturing and a high compression ratio. The robust containers withstand extreme loads.

The dual-membrane domed roof collects the resulting biogas in the large gas storage facility.

Control of the plant is very simple, by means of touchscreen or remote data transmission.



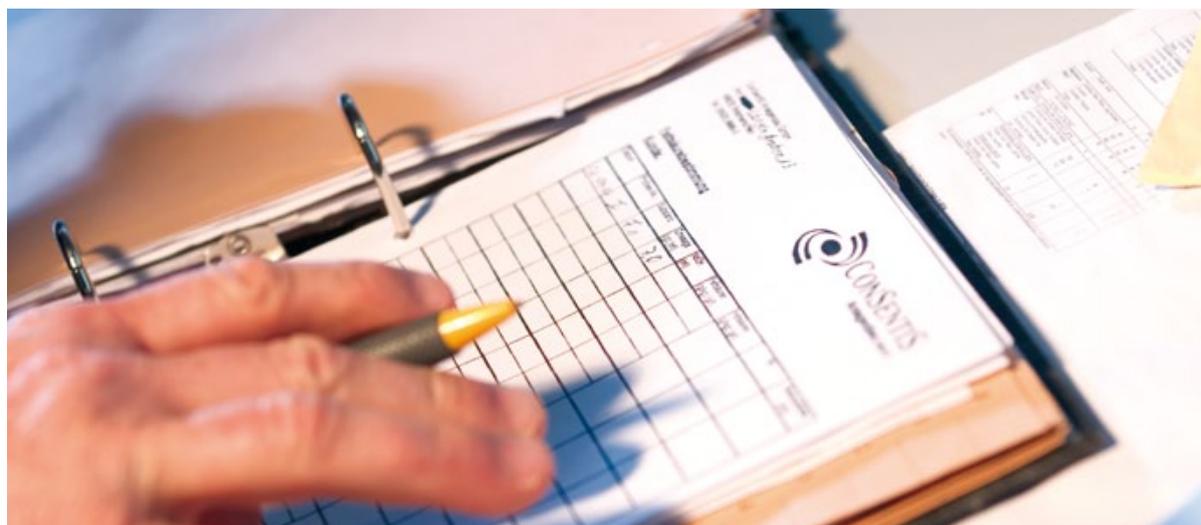
## Maintenance and service

The availability of your plant is our highest priority. Service staff are available to you throughout the start-up phase, until full load is attained. For example, they regularly check the biological process and the control adjustment.

From the very beginning, you are prepared for the operation of the biogas plant. For trouble-free operation, regular maintenance is very important. For this, we offer you a choice of different support components:

- billing by time and materials, or
- a support contract with a fixed charge.

Contact us! Together, we will find the most reasonable solution for your plant. In the event of unexpected problems, our 24-hour service is available to you.





**CONSENTIS**

Biogas-Anlagenbau

Consentis Anlagenbau GmbH  
Am langen Graben 13  
49835 Wietmarschen  
Phone +49 (0) 59 25 / 99 86-0  
Telefax +49 (0) 59 25 / 99 86-11  
[www.consentis.de](http://www.consentis.de)  
[info@consentis.de](mailto:info@consentis.de)