



Taurus reactor - Anaerobic digestion systems for manure & co-products



Applications

The Thecogas Biogas division of Nijhuis Water Technology, designs and supplies manure and co-digestion systems, the Taurus reactor. Under anaerobic circumstances agriculture wastes and organic substances are digested into biogas and a digestate. The feed into the process could consist of:

- Manure of animals
- Agricultural wastes
- Food factory wastes
- Co-substrates, like maize, corn, grass and sugar beets

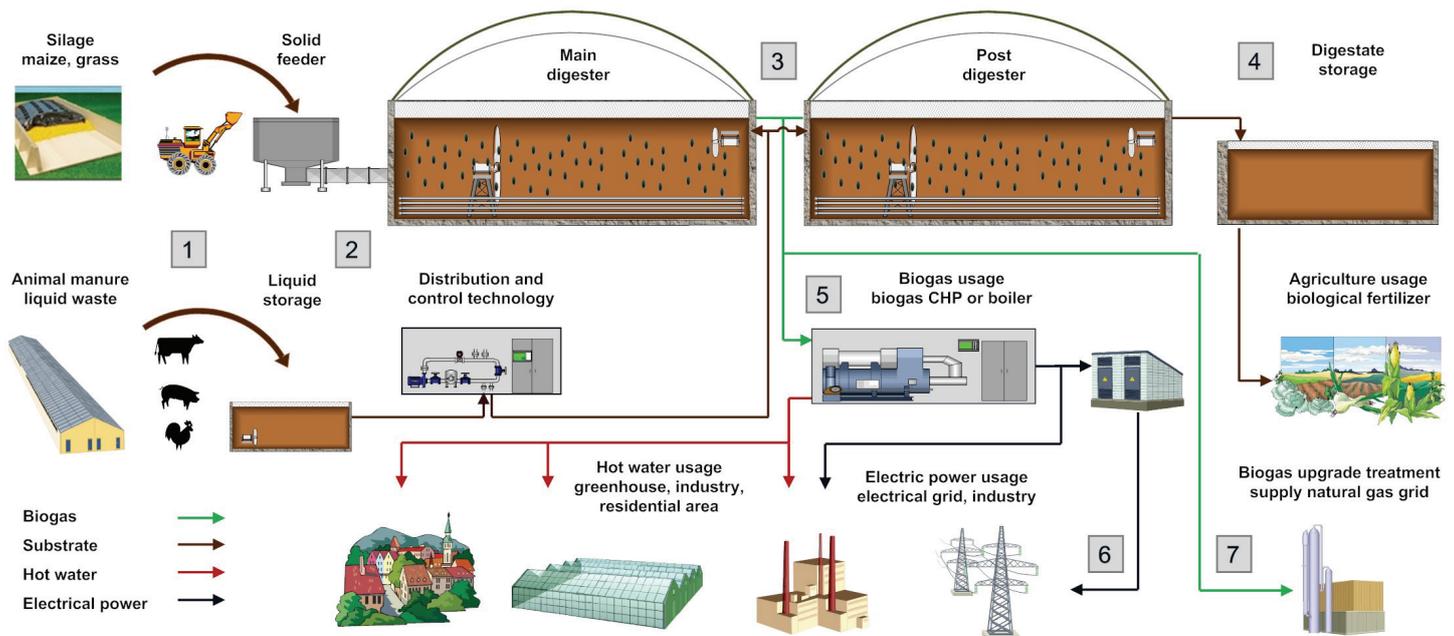
Depending on the available raw materials, we will design the optimal system. This system can include the following steps: raw material storage, raw material preparation, balancing, digester including mixing system, biogas conditioning and usage, digested solids separation and processing and digestate treatment.

Advantages & Characteristics

- Energy from a biogas plant is carbon neutral
- Biogas and energy can be produced 24/7
- Low dependence on energy from the public net and import from other countries
- Energy generation is not directly depending on wind, water and sun conditions
- Biogas can be stored
- Fertilizer value of manure is improved by the biogas process



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Technical description

1. **Raw material storage**
 - a. solids materials: silage storage clamp
 - b. liquid materials: storage tanks

The required storage capacity is depending on the raw materials available for your plant.
2. **Digester feeding systems**

Solids materials are periodically fed to a bunker where the solid materials are pretreated and mixed before the are automatically transferred to the digester. Liquid materials are automatically pumped into the digester system.
3. **Digester and optional post digester**
 - a. Under anaerobic conditions the feed materials are digested / fermetated to create biogas with around 50-60% methane and 30-40% carbondioxide. To create an optimal amount of biogas and a stable system, the reactor is designed to operate at 38°C. The digester tank is equipped with a mixing and heating system.
 - b. For high loaded systems a post digester can be added to the design. In the post-digester the process continuous and the additional gas can be extracted.
4. **Digestate storage**

The fermentation residues from the digester and optional post digester is called digestate. Digestate is a high quality liquid fertilizer, which can substitute chemical fertilizers.
5. **Combined Power and Heat (CHP) unit**

A CHP unit is a motor that drives a generator to electricity and heat out of the created biogas. Energy can be used for operating the biogas plant and can be sent to the public network. The heat will be used to maintain the temperature in digester tanks and can be distributed for other purposes like heating of greenhouses, living areas, industry.
6. **Electricity power supply**

For the larger biogas plant the created energy needs to be transformed from 400V to 10,000V before connecting to the public network. For smaller plants this is not applicable.
7. **Upgrading of biogas to natural gas**

Instead of point 5 and 6 there is an option to upgrade the biogas to natural gas. Carbon dioxide has to be extracted from the biogas, before feeding the gas to the public natural gas network.