

Anarerobic Digester Technolgy

Turning organic matter into renewable energy



November 2011



1. Our company
2. Our technology
3. References



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Viessmann Group

Viessmann Werke GmbH & Co.KG

- Founded: 1917
- Based in: Allendorf (Eder)
- Employees: 9.400
- Turnover: 1,7 Mrd. Euro
- Export %: 56 %



Viessmann Group is the leading manufacturer for heating solutions and energy systems.

Schmack Biogas GmbH

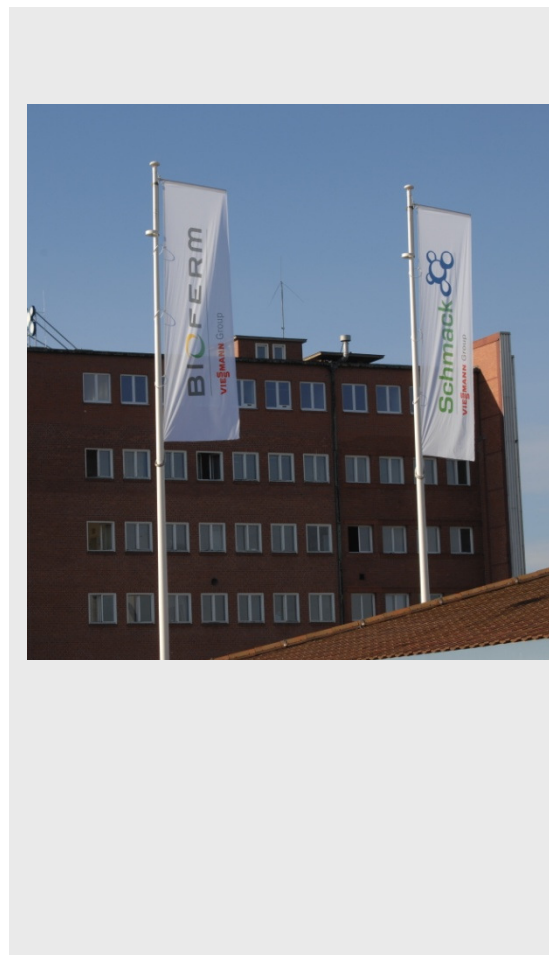
- Gegründet: 1995
Übernahme durch die Viessmann Gruppe zum 1. Januar 2010
- Sitz: Schwandorf (Bayern / Opf.)
- Produkte: Komplettdprogramm
Biogastechnologie
Biologischer Service
Technischer Service
- Mitarbeiter: ca. 250



- Bis heute über 230 Biogasanlagen mit insgesamt ca. 100 MW installierte Leistung gebaut
- Ulrich Schmack war beratendes Mitglied am Energiegipfel der Bundeskanzlerin
- www.schmack-biogas.com

BIOFerm GmbH

- Gegründet: 2000
2007 Übernahme durch die Viessmann Gruppe
- Integration: 2010 Bündelung der Biogas-Kompetenz an einem Standort. Integration der BIOFerm GmbH in die Schmack Biogas GmbH
- Sitz: Schwandorf (Bayern / Opf.)
- Produkte: Trockenfermentation
Biologischer Service
Technischer Service
- Mitarbeiter: 35 (vor Integration)



- Bis heute über 30 Trockenfermentationsanlagen international in Betrieb
- www.bioferm-energy.com



1. Was ist Biogas?
2. Our technology
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Technologiealternativen in der Vergärung

Schmack Biogas GmbH

Wet Fermentation



- Schwerpunkt: NawaRo (nachwachsende Rohstoffe)

Dry Fermentation



- Biogasanlagen für nicht pumpfähige Einsatzstoffe
- Schwerpunkt: kommunale Bioabfälle

Modell EUCO® Titan 350



- 1 PASCO Dosierstation
- 2 CALIX Vorgrube
- 3 EUCO® Hochleistungsfermenter
- 4 COCCUS® Grubenspeicherfermenter
- 5 AIO All-In-One-Modul (BHKW mit Anlagensteuerung und Substratverteilung)
- 6 Trafostation
- 7 SULA Gasdichtes Gärrestelager

Wet digester technology

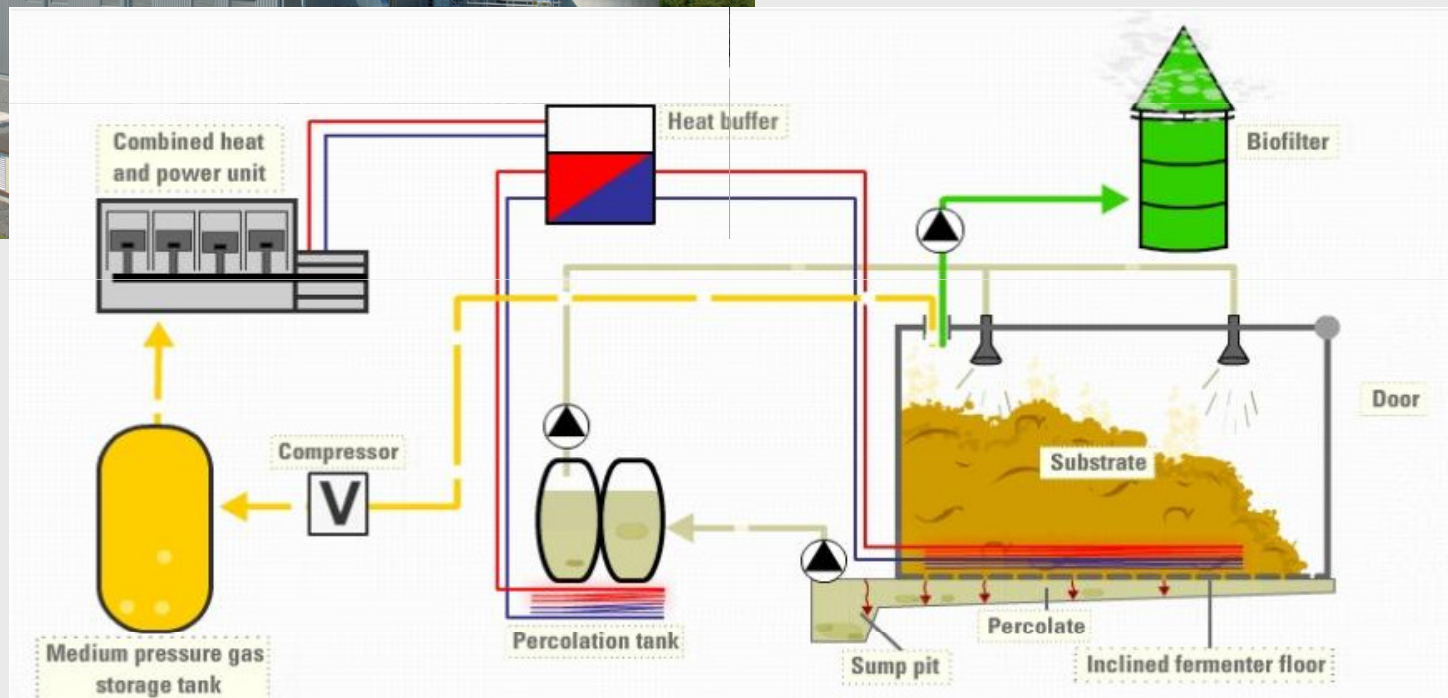
Pfropfenstromfermenter EUCO®

Key facts:

- Continuous – System
- Mesophilic - 38°C to 40°C
- Loading fermenter through rocking floor feeder
- EUCO® System
 - High organic load rate up to 15 kg/m³*d
- Recirculation of digestate serves as an inoculum
- Slow moving parts – slow stirring or mixing of product
- Motor and inverter outside (Accessibility and Service)
- Low parasitic load (6%)
- No addition of water



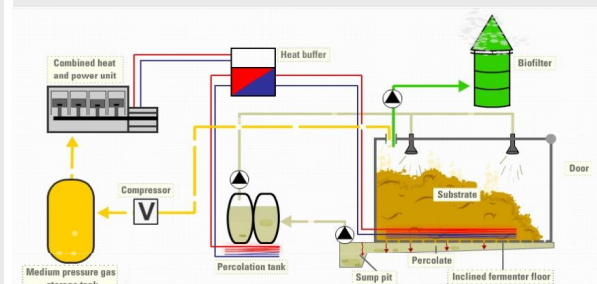
Standardisierte Anlagenkonzepte Trockenvergärung



BIOFerm Dry Fermentation System

Key facts:

- Batch – System
- Mesophilic - 38°C to 40°C
- Loading / unloading with frond end loader
- Substrate mixing ratio
 - Min. 30% fermented material / max. 70% Fresh material
- Fermented material serves as an inoculum
- No moving parts – no stirring or mixing of product
- No pre treatment
- No problem with contaminants like plastic, wood and metal
- Low parasitic load (4%)
- No addition of water





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Biogasanlage Wattendorf – COCCUS® 185

Agricultural Plant

- **Operator**
Popp Franz und Andreas GbR
- **Location: Bavaria, Germany**
- **Substrates**
 - 1.000 t liquid cattle manure
 - 1.600 t corn silage
 - 1.600 t whole plant silage
 - 300 t cereals
- **Start up**
August 2005



Biogasanlage Fischbach – COCCUS® 185

Agricultural Plant

- **Operator**
Farmer Johann Mayer
- **Location: Germany, Bavaria**
- **Substrates**
3.500 t liquid cattle manure
1.700 t Grass silage
1.700 t Corn silage
400 t Solid hog manure
- **Start up**
December 2009



Dry fermentation plant Allendorf (Eder) – 190kW

Farm and Landscape conservancy material

- **Operator**
Viessmann Biomasse KG
- **Location: Germany, Hessen**
- **Einsatzstoffe**
7.000 t
Horse manure, corn silage, grass silage
(from airport)
- **Start up**
August 2010
- **Features**
Heat completely used in factory



Biogasanlage San Canzian D'Isonzo – 910kW

Agricultural plant

- **Operator**
Società Agricola Aziende L. Bennati S.p.a.
- **Location: Italien**
- **Substrates**
22.000 t Solid cattle manure
6.000 t Corn Silage
- **Start up**
April 2010



Biowaste Moosdorf – 590kW

Biowaste treatment plant

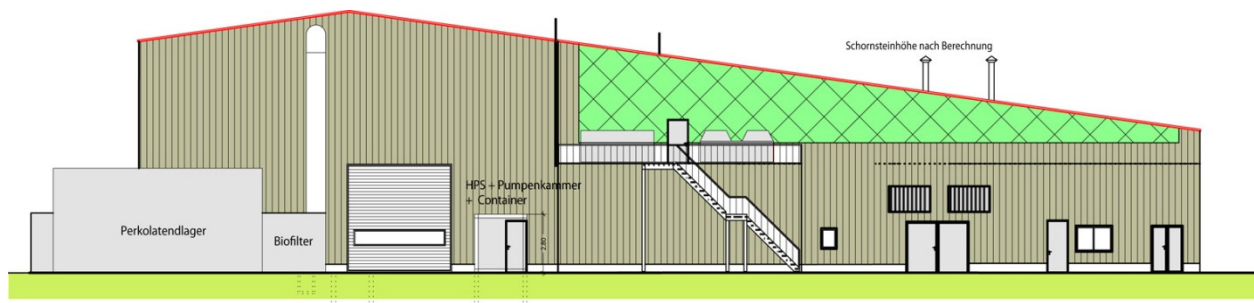
- **Operator**
BIOMethan Moosdorf
- **Location: Bavaria, Germany**
- **Feed stock**
9.000 t Biowaste (Brown Bin Collection)
7.000 t Yard Waste
- **Start up**
Dezember 2007
- **Features**
Decentralised CHP unit (2km gas pipe)



Berlin Hennickendorf – 610kW

Biowaste treatment facility

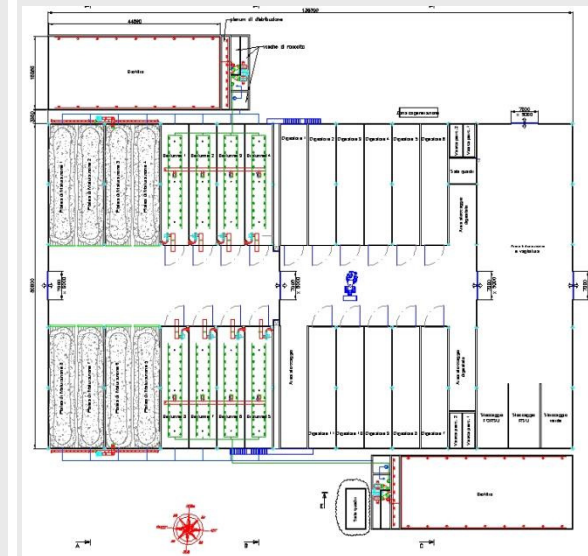
- **Operator**
Plan-E Büssow & Co.KG
- **Location: Brandenburg, Germany**
- **Substrates**
9.000 t Biowaste (Brown Bin)
5.000 t Yard Waste
4.000 t Food waste
- **Start up**
Start up 2011
- **Features**
Pasteurisation, Digestate Dryer, Composting



Sogliano Ambiente – 1 MW_{el}

Biowaste treatment facility

- **Operator**
Sogliano Ambiente
- **Location: Italy, Sogliano al Rubicone**
- **Substrates**
50.000 t Biowaste + MBT Material
- **Start up**
under construction, Start up 2012
- **Features**
Depackaging, Composting



Biomethan production facility Schwandorf – 10 MW Gas

Grid injection

- **Operator**
E.ON Ruhr Gas (Plant)
E.ON Bayern Netz GmbH (Grid)
- **Location: Brandenburg, Germany**
- **Capacity**
Raw Biogas treatment: 2000m³/h
Total capacity: 10Mio m³/year
- **Substrates**
150.000 t Corn silage, Grass silage,
Catch crops
- **Start up**
Start up 2008
- **Features**
Gas cleaning, Grid injection



Biomethan production facility Schwandorf

Grid injection



Biomethan production facility Aiterhofen (Munich) – 10 MW Gas Grid injection

- **Operator**
E.ON Ruhr Gas (Plant)
E.ON Bayern Netz GmbH (Grid)
- **Location: Bavaria, Germany**
- **Capacity**
Raw Biogas treatment: 2000m³/h
Total capacity: 10Mio m³/year
- **Substrates**
150.000 t Corn silage, Grass silage,
Catch crops
- **Start up**
Start up 2009
- **Features**
Gas cleaning, Grid injection



Projektbeispiel Biomethananlage Aiterhofen Gaseinspeisung



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