

# ***Improvement of anaerobic digestion by ultrasound technology***

## ***Farming biogas plant Wegener, 29646 Bispingen, Germany***



### **I. Brief snapshot of the plant**

- **Electrical power**  
700 kW  
1,100 kW (since January 2010)
- **Feed of the plant (Ø 2009)**  
6% Corn  
82% VS  
63% Maize  
32% VS  
5% Manure (turkey hen)  
40% VS  
26% Liquid manure (cattle)  
10% VS
- **Total amount of substrate**  
48.3 t fresh substrate/ d (Ø 2009)  
Jan. – Sep.: 48.6 t fs/d  
Oct. – Dec.: 47.3 t fs/d  
48.3 t dry solid / d (Ø 2009)  
Jan. – Sep.: 14.5 odt/d  
Oct. – Dec.: 13.9 odt/d
- **Production of biogas (Ø 2009)**  
8.667 m<sup>3</sup>/d
- **Generation of electricity (Ø 2009)**  
16.434 kWh/d
- **Conveyance**  
Börger: push floor + pump  
The contribution of the feed is aided by recirculation of the digester content
- **Primary digester (PD)**  
2 tanks à 1.300 m<sup>3</sup>
- **Secondary digester (SD)**  
2 tanks à 1.300 m<sup>3</sup>  
1 tank à 2.300 m<sup>3</sup>
- **Hydraulic retention time**  
> 100 d
- **Final storage for digastate**  
1 tank à 2.300 m<sup>3</sup>
- **Digastate**  
Digastate is used as dung

## II. Objective of the ultrasound disintegration system

- Increase of biogas production
- Reduction of feed
- Higher working load of the generator

## III. Installation of the Ultrawaves ultrasound disintegration system

- Installation in November 2008
- 30% (36 m<sup>3</sup>/d) of recirculated biomass of the secondary digester is treated by the 24 hours operating ultrasound system and pumped into the primary digester (Figure 1)
- The system is operating 24 hours per day in a 2 hours alternating mode

## IV. Results of the ultrasound treatment (Figure 2)

- ✓ Increase of biogas production
- ✓ Reduction of daily feeded substrate
- ✓ Higher working load of the generator

## V. Outlook

- ❖ Implementing of a 2nd Ultrawaves ultrasound system is intended for the end of 2010

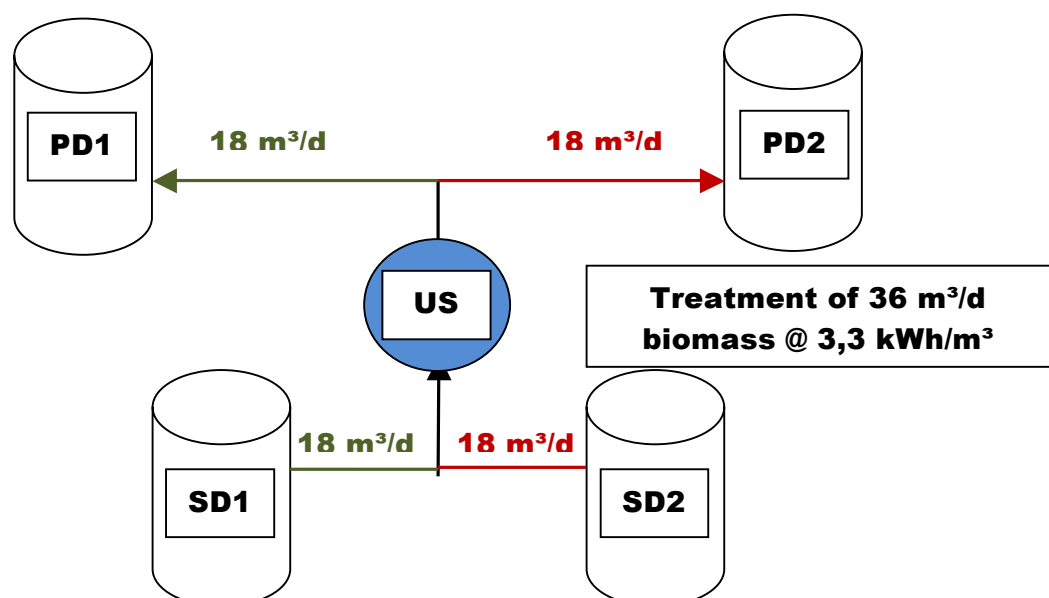


Fig. 1: Installation of the ultrasound disintegration

Accord of theoretical and actual biogas production considering of the organic load

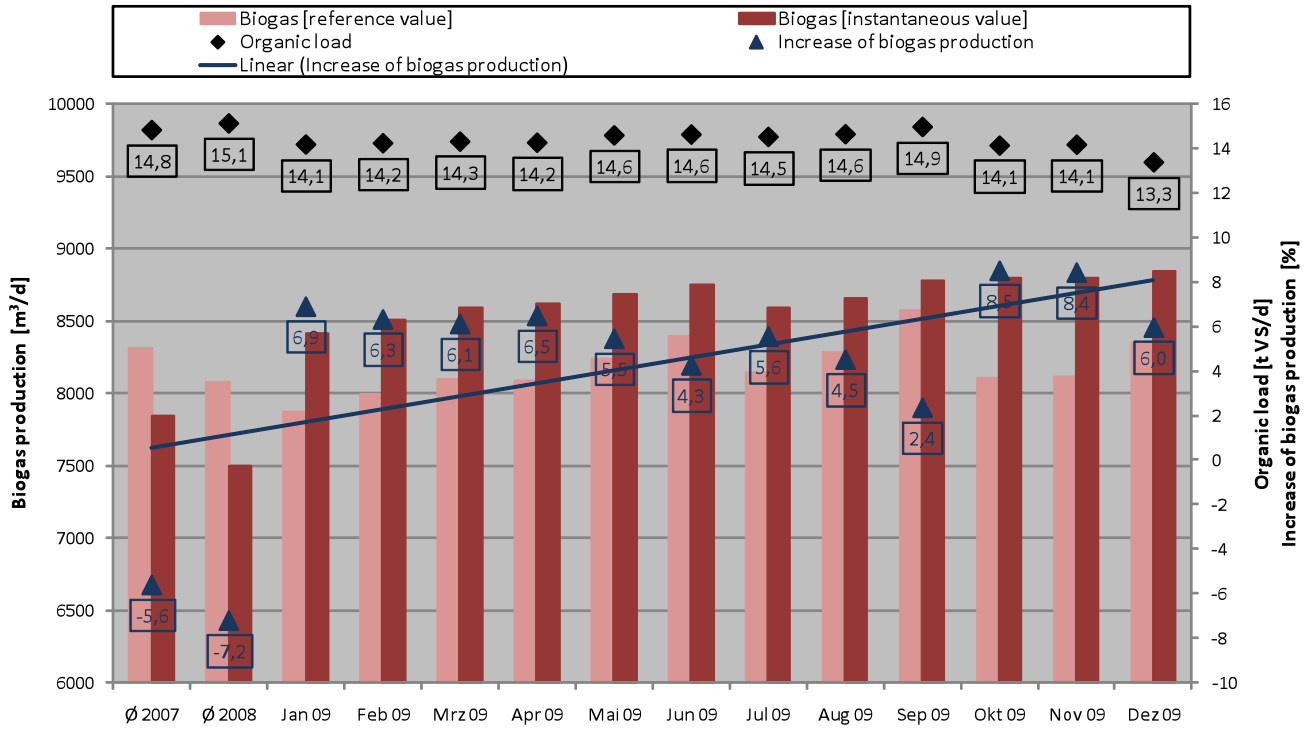


Fig 2: Results of the ultrasound treatment