ULTRAWAVES ULTRASOUND SYSTEM FOR IMPROVEMENT OF BIOGAS PRODUCTION ON FARMLAND BIOGAS PLANTS

Bordesholmerland FBP, Germany



I. Specification of the plant

Plant capacity	• two parallel lines (BL1 and BL2) • 2 x 537 kW • 2 main digesters (MD) à 2,500 m3 • 2 secondary digesters (SD) à 2,500 m3 • 2 storage tanks (S) à 2,500 m3 • hydraulic retention time of 90 days per digester
Substrate (Ø 2010)	• 2 x 25 t/d maize • 32% – 38% organic dry solid
Biogas production(Ø 2010)	• 2 x 6,150 m^3/d (235 L/kg substrate)

II. Objective of the ultrasound test

- Intensification of anaerobic digestion process
- Reduction of substrate input
- Increase of specific biogas yield

III. Installation of the Ultrawaves ultrasound system

- One ultrasound system (5 kW) was installed in line BL2 in May 2011
- Sonication of partial flow (36 m^3/d) recirculated from secondary to main digester (figure 1)

IV. Results of the ultrasound treatment

- Reduction of substrate input by 2,2 tonnes per day (9% less substrate; figure 2)
- Increase of methane concentration by 3% to 53%
- Reduction of viscosity, thus decreasing energy consumption for mixing and pumping (figure 3)

V. Outlook

- Expansion of plants to 2 x 800 kW
- Installation of a second Ultrawaves ultrasound system in March 2012



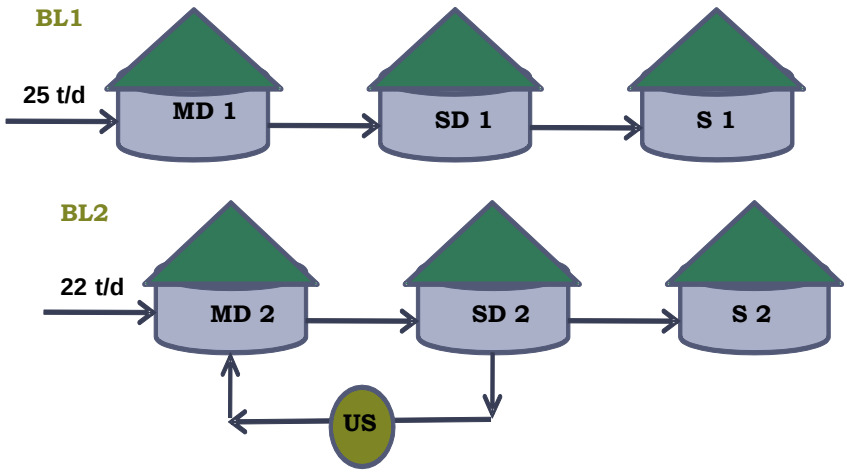


Figure 1: Layout of FBP Bordesholmerland and integration of ultrasound system (US)

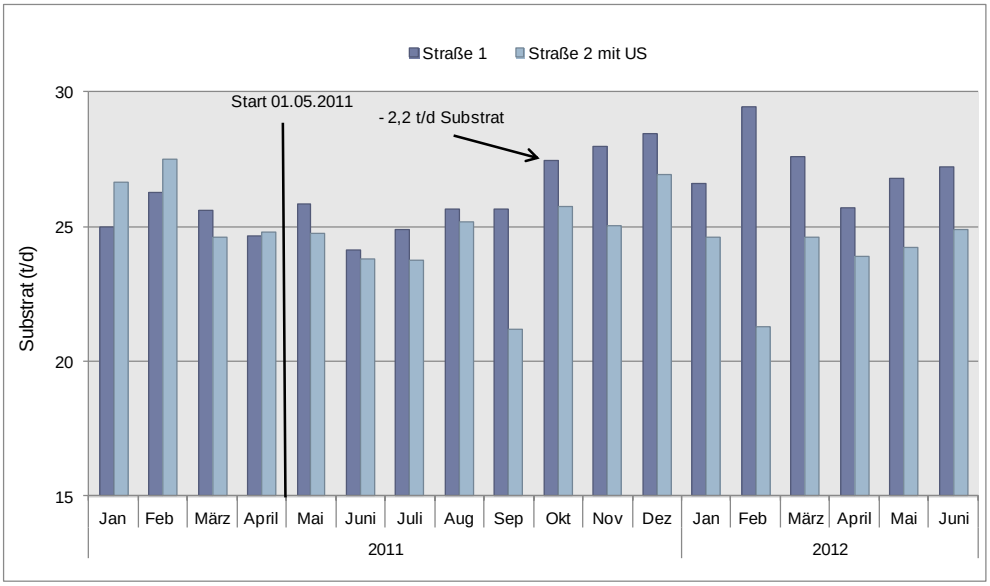


Figure 2: Daily substrate input in 2011 in comparison to biogas production

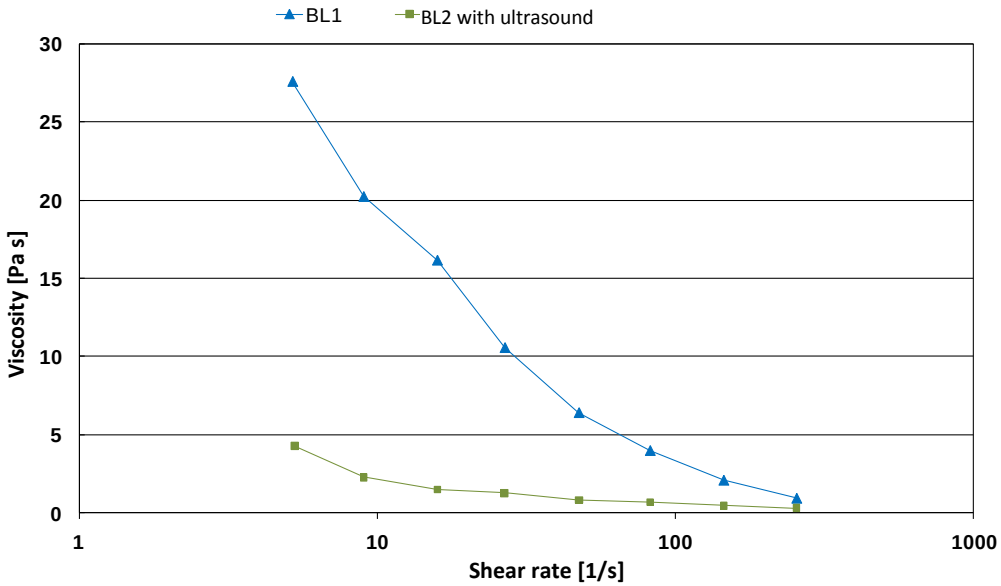


Figure 3: Viscosity of the biomass in the digester

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