ULTRAWAVES ULTRASOUND SYSTEM FOR IMPROVEMENT OF ANAEROBIC FOOD WASTE DIGESTION

Mariks FWBP



I. Specification of the plant

Plant size	• 2 digesters à 1,800 m³ • 1 secondary digester à 1,800 m³ • 1 storage tank à 5,000 m³ • hydraulic retention time: 40 days
Capacity	• nominal capacity: 1.100 kW • el. power production: 700 kW • concentration of methane about 58%
Substrate	• 73 t/d of food waste or similar organic waste

II. Objective of the ultrasound test

- Intensification of anaerobic digestion process
- Increase of specific biogas yield

III. Installation of the Ultrawaves ultrasound system

- continuous operation of one US-reactor (5 kW operating power) from April to August 2011
- Sonification of partial flow (34 m³/d) recirculated from secondary to main digester (see figure 1)

IV. Results of the ultrasound test

- Intensification of anaerobic digestion process
- Increase of power input from 696 kW to 786 kW (13% increase; see figure 2)
- Decrease of volatile solids concentration from 56% to 52% in digestate (see figure 3)

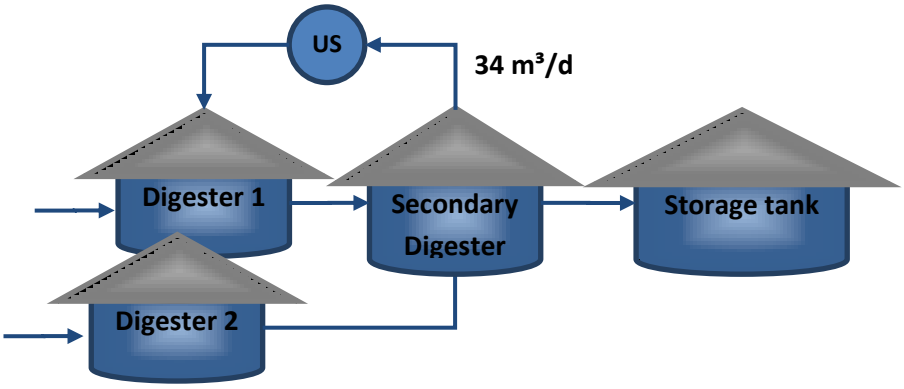


Figure 1: Plant layout of Mariks FWBP and integration of ultrasound system (US)

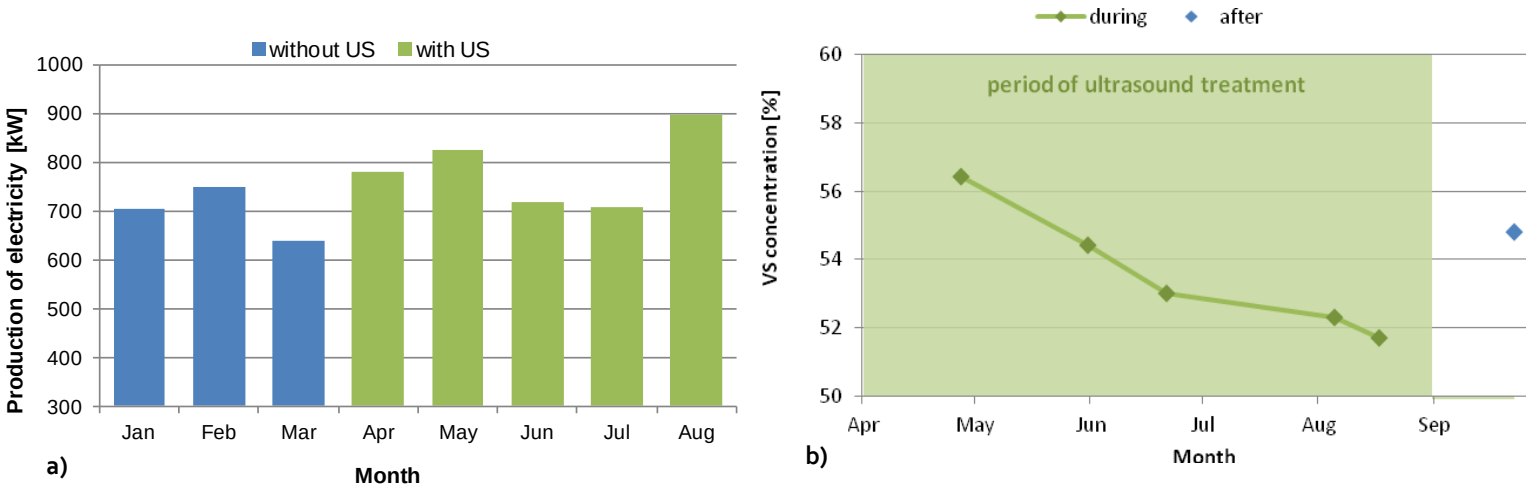


Figure 2: a) Production of electricity with and without ultrasound treatment, b) volatile solids (VS) concentration in the secondary digester during and after the period of ultrasound treatment

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