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Monitoring of full-scale hydrodynamic cavitation pretreatment in agricultural biogas plant

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Abstract (100 – 150 words)

The implementation of hydrodynamic cavitation (HC) pretreatment for enhancing the methane potential from agricultural biomasses was evaluated in a full scale agricultural biogas plant, with molasses and corn meal as a supplementary energy source. HC batch tests were run to investigate the influence on methane production, particle size and viscosity of specific energy input. 470 kJ/kgTS was chosen for the full-scale implementation.

Nearly 6-months of operational data showed that the HC pretreatment maximized the specific methane production of about 10%, allowing the biogas plant to get out of the fluctuating markets of supplementary energy sources and to reduce the methane emissions. HC influenced viscosity and particle size of digestate, contributing to reduce the energy demand for mixing, heating and pumping. In the light of the obtained results the HC process appears to be an attractive and energetically promising alternative to other pretreatments for the degradation of biomasses in biogas plant.

Keywords

Biogas; bioenergy; pretreatments; hydrodynamic cavitation; process monitoring.

Highlights

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