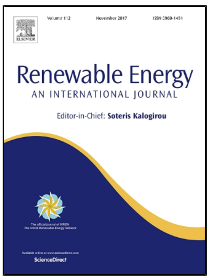
Accepted Manuscript



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PII:	S0960-1481(17)30662-6
DOI:	10.1016/j.renene.2017.07.047
Reference:	RENE 9022
To appear in:	*Renewable Energy*
Received Date:	06 October 2016
Revised Date:	12 March 2017
Accepted Date:	10 July 2017

Please cite this article as: M. Gottardo, F. Micolucci, David Bolzonella, Hinrich Uellendahl, Paolo Pavan, Pilot scale fermentation coupled with anaerobic digestion of food waste - Effect of dynamic digestate recirculation, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.07.047

PILOT SCALE FERMENTATION COUPLED WITH ANAEROBIC DIGESTION OF FOOD WASTE - EFFECT OF DYNAMIC DIGESTATE RECIRCULATION

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Abstract

The anaerobic digestion in double stage is a known and adopted system, but the process productivity and optimization still remain an aspect to investigate. The accumulation of organic acids (produced during fermentative metabolism) in the first stage generally decrease the pH below the optimal values (5.5). A pre-evaluation strategy by control charts for further pH control is proposed. The process combines in series the 1st Fermentation process and the 2nd Anaerobic Digestion process, using the recirculation of the anaerobic digestion effluent, rich in buffer agents, to control the pH in the 1st stage. The recycle ratio becomes a further operating parameter that should be properly managed. A proper management as dynamic recirculation flow allows to maintain the pH of the first phase to values higher than 5. Specific hydrogen production, specific methane production and volatile fatty acid production; 170 L/kgTVS at 40% H_2, 750 L at 67%