"2-stage process for a higher flexibility of biogas-plants"

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The increasing part of renewable energy in the electricity production mix with its known fluctuations of wind and photovoltaic plants is leading to an enlarged discrepancy of production and consumption.

Up to now the electricity production of biogas plants is more or less constant but could be used in future more to balance the energy production by using higher biogas storage capacity.

An interesting alternative could be a 2 stage process. The 1st stage is operated at higher loadings and low pH where mainly substrate hydrolysis takes place and relatively small quantities of H_2/CO_2 gas are produced. The effluent shows high concentrations (total > 10 g FA/l) of mainly butyric and caproic acid which could easily and stable be temporarily stored in liquid-tanks. The transformation of the acidic intermediates from hydrolysis to biogas (and finally electricity) in the 2nd stage is faster compared to the traditional fermentation. The storage capacity for the acidic intermediates is more than 10 times smaller compared to the temporary storage of biogas.