

Developing the Potential for CO₂ Capture and Utilization in Hybrid Anaerobic Digesters

AIMS:

To demonstrate in-situ injection of exogenous H₂ and CO₂ into a conventional anaerobic digestion process can substantially increase volumetric methane production, and to explore the limits of this addition

OUTCOMES:

Injection of H₂ and CO₂ increased volumetric methane production from to 0.97 to 4.54 L CH₄ L⁻¹ day⁻¹ and specific methane production from 0.32 to 1.51 m³ CH₄ kg⁻¹ VS, around 5 times the value without CO₂ biomethanisation



OUTPUT:

- Results confirmed a recently-derived theoretical relationship between pH and CO₂ partial pressure can provide a basis for process control in technology transfer
- Metagenomic analysis will offers further insight on how microbial population and pathway relate to functional changes
- Scenario modelling supports integration in waste management and in industries with unavoidable CO₂ emissions

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