

Pilot Research Plant for Enhancing Biogas Production Yields in Anaerobic Mesophilic Fermentation Processes

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Abstract: In the context of green energy transition, the neutralization of biomass residues for minimizing the emission of CO₂ and CH₄ is gaining a very important role. As a consequence, the detailed studies of the biotechnologies dedicated to biomass fermentation, biomass processing, and conditioning are gaining major interest for the industry and for the local authorities. At Ovidius University of Constanta, the HyRES Platform has been developed for advanced research activities on the conversion of renewable energy sources to hydrogen with an emphasis on biomass processing. In the paper, the rationale and motivation for structuring the different modules of the HyRES Platform and, in particular, the pilot research plant for enhancing biogas production yields in anaerobic mesophilic fermentation processes are discussed. The research activities that have been conducted on the pilot installation, the most relevant results, and the innovative solutions. The paper summarizes the activities that have been carried out for developing the hardware and software components of the pilot case and the results that have been obtained by the implementation of the system in the Murighiol region.

Keywords: HyRES Platform; Biomass Fermentation; Biogas Enhancement; Renewable Hydrogen; Pilot Implementation.

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