Project Fact Sheet

Technische Hochschule Ingolstadt
Institute of new Energy Systems

Project Title	**Process integration of a trickle bed reactor for the biological methanation of hydrogen in pressurized water scrubbing-based biomethane production (Hy2Biomethane)**
Keywords	Biogas, biological methanation, pressurized water scrubbing, trickle bed reactor , flexible power generation, renewable energies

Project Details

Project Start	2021	**Duration**	2 Years
Grant Scheme			
Funding Authority	BMWi	**Project ID**	03EI5431A
Project Budget	183,261.93 €		
Project Leader	Prof. Dr.-Ing. Markus Goldbrunner		
Contact Person	Katharina Bär		

Project Partners Friedrich-Alexander-Universität Erlangen-Nürnberg (Lehrstuhl für Energieverfahrenstechnik), regineering GmbH

Description

In the future energy system, power-to-gas technology (PtG) is expected to play a key role in the field of energy storage and sector coupling. For methane production from hydrogen and carbon dioxide, in addition to the catalytic reaction, biological methanation has established itself as a promising conversion pathway. Biological methanation is characterized by comparatively low purity requirements for the reactant gases as well as robust and load-flexible operation. This makes the process particularly interesting for small-scale and demand-oriented applications. A major disadvantage of biological methanation is the significantly lower volume-specific methane formation rate. A promising approach to increase the phase transition within the formation is to design a high pressure process in a trickle bed reactor. Within the scope of the planned project, the process-technological integration of a trickle bed reactor into the pressurized water scrubbing based biogas upgrading is to be designed, developed and tested in the laboratory. Two essential process synergies have to be utilized in order to develop efficiency enhancement measures. On the one hand, by removing the process water from the high-pressure absorption process, the pumping or compression power required to supply the two reactants water and CO_2 for the biological methanation process is eliminated. On the other hand, the methane enrichment associated with the biological methanation process can be used to substitute CO_2 capture as part of the biogas upgrading process.