

RESEARCH PROJECT HYTECH: BIOLOGICAL PRODUCTION OF HYDROGEN VIA DARK FERMENTATION FROM WASTEWATER

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Introduction

- Dark fermentation represents a sustainable and resource-saving production pathway for biohydrogen.
- Waste water from the food industry can be used for the biological production of hydrogen.
- In comparison to dark fermentation, which is operated at ambient pressure and approx. 60° C, industrial processes such as high-temperature electrolysis or steam reforming use very energy-intensive temperatures of up to 1,700° C and pressures of up to 300 bar [1].
- The process concept investigated within this project uses two separated stages for the production of hydrogen and methane.

Aim of the Project

Goals of the project are:

- Optimization of process stability and process efficiency through innovative reactor designs,
- Expansion of the usable residues for dark fermentation,
- Determination of the potential uses of biohydrogen,
- Evaluation of the economic efficiency of the process,
- Development of new gas measurement technology for biohydrogen and
- pH value regulation through the use of liquid manure.

Process Concept

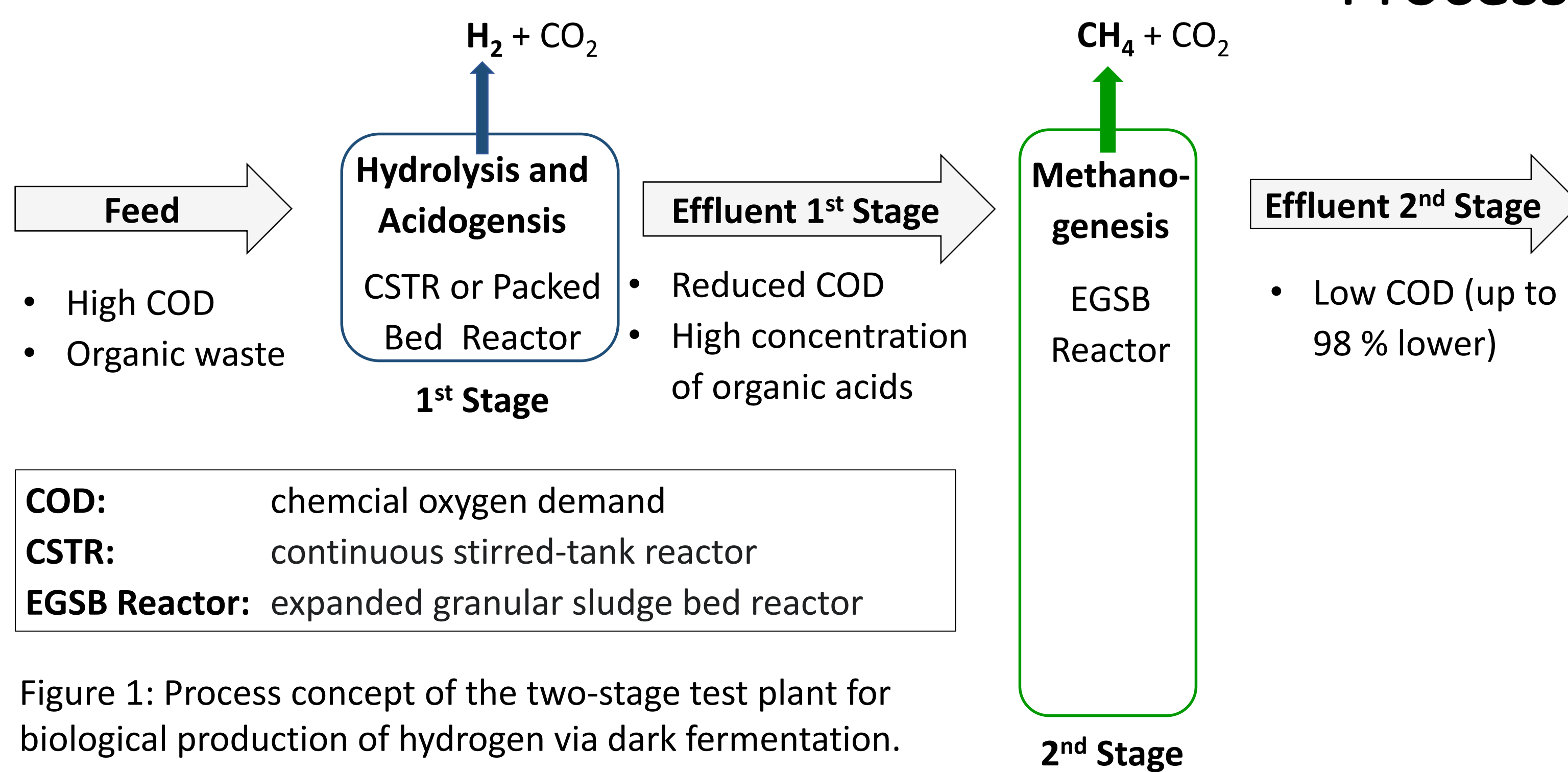


Figure 1: Process concept of the two-stage test plant for biological production of hydrogen via dark fermentation.

Outlook

- The Hytech project runs for a total of three years and started in August 2020.
- Promising substrates have been identified and the test series in the 2-stage test plant have been started.
- Further trials are necessary to enable a more stable process and to expand the available range of residues and waste waters.

References

[1] Weide, T.; Brüggling, E.; Wetter, C.; Ieradi, A.; Wichern, M. (2019): Use of organic waste for biohydrogen production and volatile fatty acids via dark fermentation and further processing to methane. International Journal of Hydrogen Energy 44, S. 24110-24125



Figure 2: Two-stage test plant for biological production of hydrogen via dark fermentation.

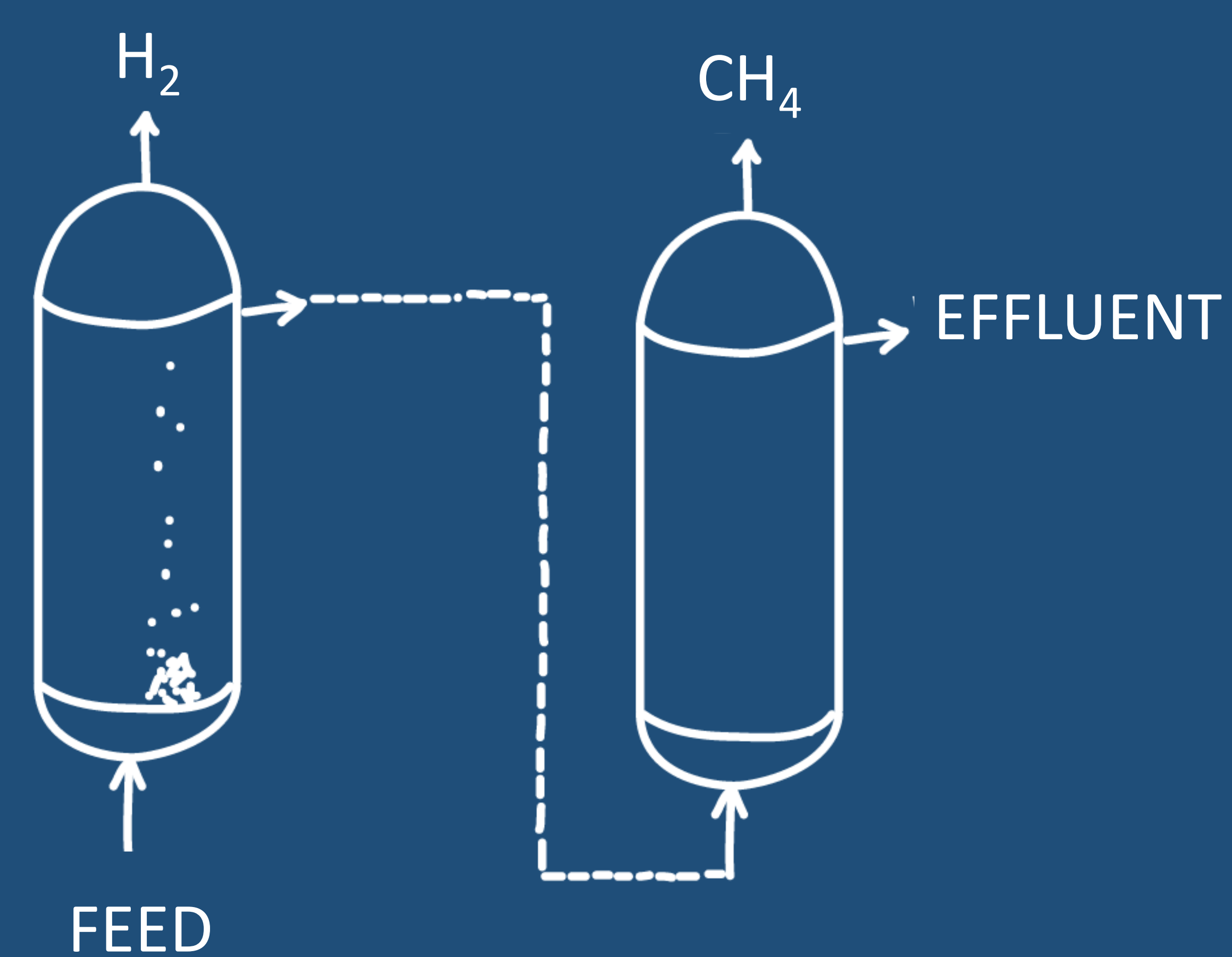
Projectpartner, Projectmanager, Funding

PRODUCTION OF HYDROGEN FROM WASTEWATER



INCREASING THE HYDROGEN YIELD AND THE EFFICIENCY OF DARK FERMENTATION

DEVELOPMENT OF A 2-STAGE TEST PLANT FOR CONTINUOUS HYDROGEN PRODUCTION



Project



Contact

