EGATEC2015
European Gas Technology Conference

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Young Researcher's Prize

Nov 25, 2015

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ÖSTERREICHISCHE VEREINIGUNG FÜR DAS GAS- UND WASSERFACH

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TECHNICAL ASSOCIATION OF THE EUROPEAN NATURAL GAS INDUSTRY

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Florian Kirchbacher

Combination of Methanation and Membrane Gas-Permeation in a Power-to-Gas-Concept

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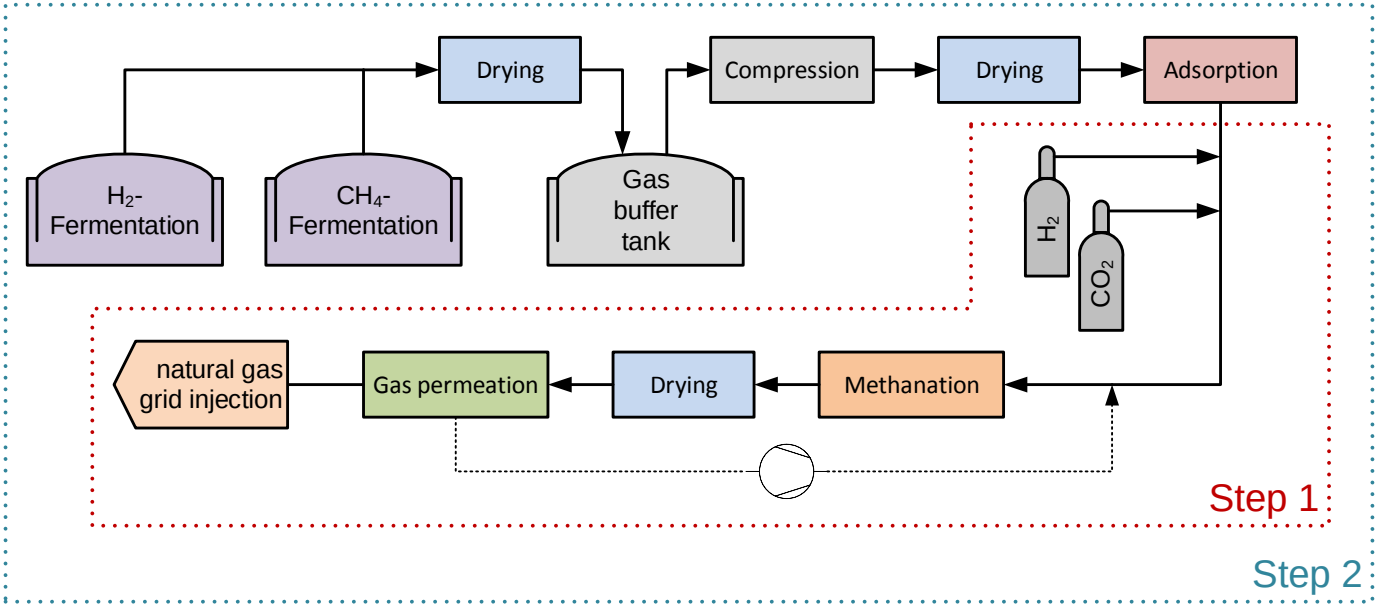
Slide 1 - Motivation

- Increasing capacities of fluctuating energy sources in electric energy grid (e.g. Wind, PV)
  - Smart grids
  - Energy storage capacity
- Power-to-Gas provides vast storage potential
- Methanation-route assures full grid compliance

Slide 2 – Methodology

- Two-staged H_2- and CH_4-fermentation
- Fixed-bed catalytic methanation
- Gas upgrading by membrane technology



Slide 3 – First results

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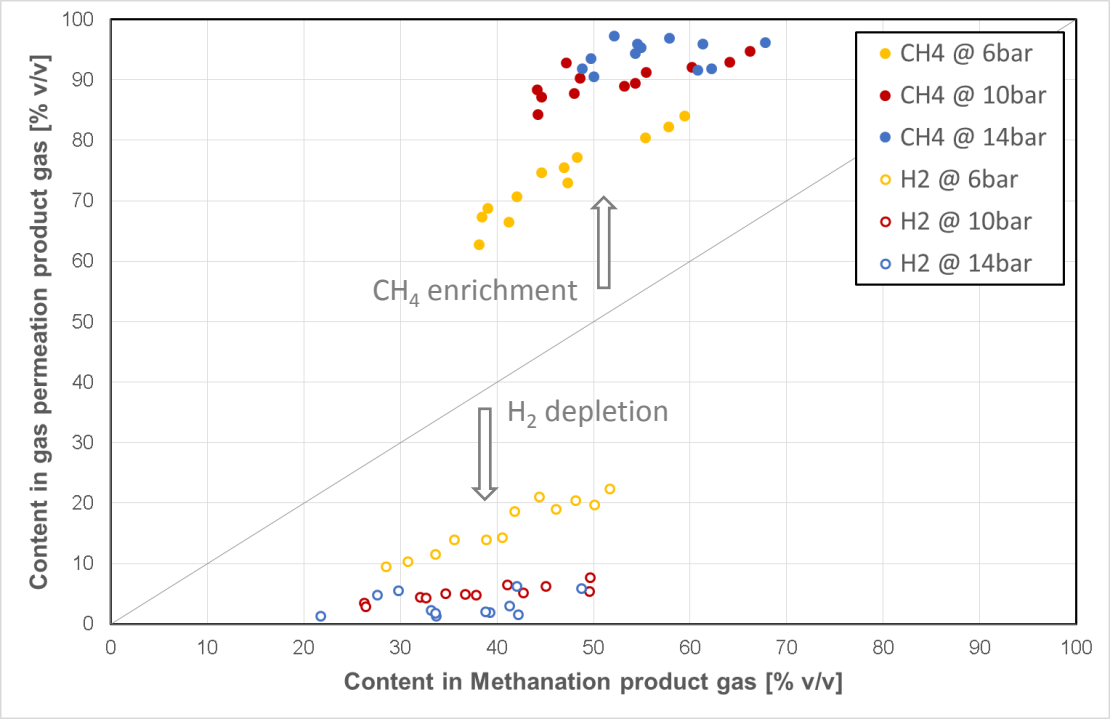
- Two-stage methanation, medium space velocity
- Single stage membrane gas upgrading

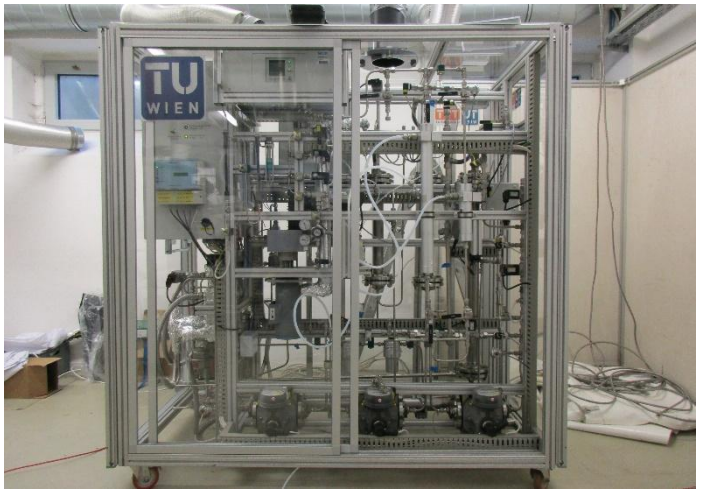


2-stage methanation
Ni/γ-Al_2O_3
H_2/CO_2 = 1/4 - 1/5
v_{space} = 3000 – 6000

1-stage gas permeation
polyimide
p = 6 – 14 bar

Slide 4 – Outlook

- Demonstration and further experimental analysis
- Optimization by process simulation
- Economic assessment
- Upscaling to a range of 100kW electrolysis



Thank you for your attention

bmwfi
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