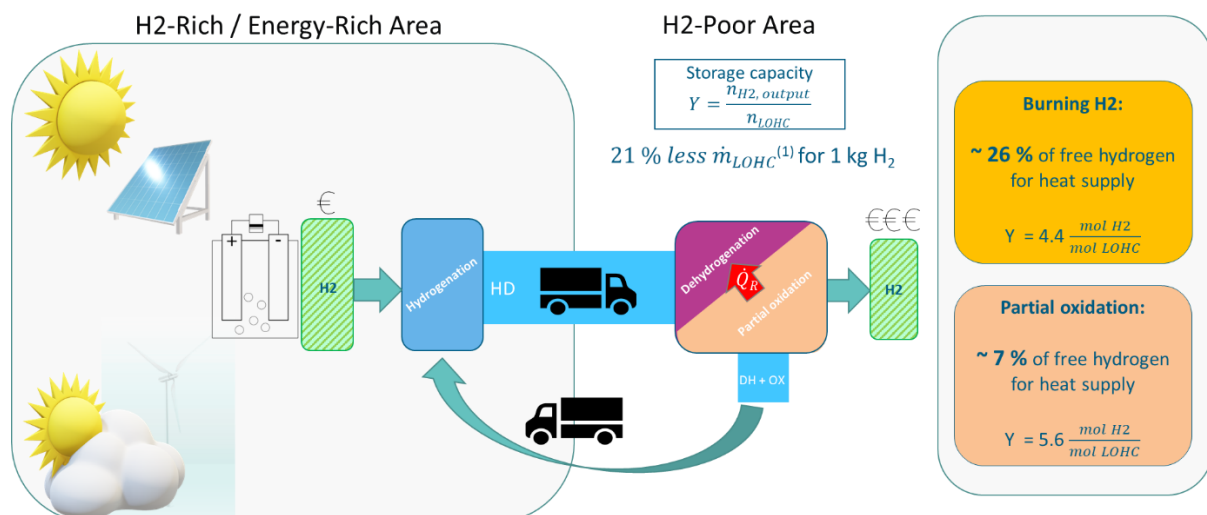


# HiWi and Master thesis in the field of a new concept in Dehydrogenation of LOHCs – Chemical Engineering, Chemical hydrogen storage

## Project description:

By bonding green-generated hydrogen to LOHCs (Liquid organic hydrogen carrier), elemental hydrogen is made transportable with multiple advantages over existing technologies. This allows to overcome large distances between energy production and consumption location via LOHC storage systems. For hydrogen release, the LOHC is dehydrogenated in an endothermic heterogenous catalyzed reaction that requires a continuous heat source. Beneath the use of waste heat and the combustion of hydrogen, the exothermic selective oxidation of LOHCs is a promising



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Fig. 1: Autothermal Dehydrogenation with selective Oxidation of LOHC<sup>(1)</sup>

## We offer:

A HiWi-Position with a subsequent Master thesis in the **Team „[Process Units for Chemical Hydrogen Storage](#)“** headed by [Dr. Patrick Preuster](#) and [Prof. Dr. Peter Wasserscheid](#).

The possibility to collaborate on an innovative and brand-new concept in the field of LOHCs.

Working in a research project team of highly motivated Doctoral Candidates.

Good salary for HiWi-Jobs plus quite new and high-quality laboratory facilities.

Opportunity to write a publication about your results in guidance with your supervisor

<sup>(1)</sup> Figure from Michael Gundermann, 08.02.2022

## Your Tasks:

Focusing on selective oxidation of the LOHC Diphenylmethane (H<sub>0</sub>-DPM) and Benzyltoluene, you will work first with your doctoral supervisor in charge on the process commissioning of a technical 1-meter Steel-Doubletube-Reactor system.



Fig. 2: 3D-Drawing of Plant for Oxidation of LOHCs

Topics of your thesis will be:

- Experiments on the continuous selective Oxidation of LOHC with the technical plant
- Investigate main influencing parameters and a parameter study
- Reaction progress and sample analysis, Evaluation of Balances over reactor
- Deriving of a first reaction kinetic correlation based on your experiments if possible
- Further experiments for overcoming technical and reaction kinetic challenges

## Your profile:

- Working towards a Master of Engineering in Chemical engineering, Process Engineering or similar
- You perform experiments accurate and have good scientific presentation
- Ideally, you have initial experience with technical facilities in laboratory scale (Small installations, Operation) and with general laboratory work
- Enthusiasm about heterogenous catalyzed gas reactions with LOHC-Systems

- You are confident in the use of MS Office. First experiences in Software like MatLab, Aspen, Origin, Python or any programming language are a big plus
- You convince with an independent working style, excellent grades, a high level of commitment as well as good communication skills

**Are you interested?**

Please send a very short text about your motivation via E-mail plus a CV and your current transcript of records to [Michael Gundermann](mailto:m.gundermann@fz-juelich.de) ([m.gundermann@fz-juelich.de](mailto:m.gundermann@fz-juelich.de)). If you need further information or have any questions, do not hesitate to contact.

08.02.2022, Michael Gundermann

**Application deadline: 15. March 2022**

**Start from 01.04.2022/01.05.2022**

<sup>(1)</sup> Figure from Michael Gundermann, 08.02.2022