

# MH2S

Munich Hydrogen Symposium 2023

OCTOBER  
4-6  
2023

Institute for  
Advanced Study  
TUM Campus  
Garching

## Empowering the Future with Hydrogen!

Join the major project Symposium of our International Future Lab Redefine H2E together with high-level experts from academia, industry and the start-up scene

Learn more, discuss and interact in 4 focus areas:

Reversible solid oxide cells and systems

Electrically-assisted biomass and waste gasification

Biocatalytic hydrogen production and fermentation of alcohols

System aspects including LCA, TEA, energy system modelling and public acceptance



# PROGRAM

WEDNESDAY, OCT 4

TIME CONTENT

9.30 **Registration**

10.00 **Welcome by the Conference Chair & Opening remarks**

Prof. Hartmut Spliethoff (Technical University of Munich, Germany)

Dr. Sebastian Fendt (Technical University of Munich, Germany / TUM REDEFINE H<sub>2</sub>E)

10.45 **Keynotes - Setting the scene**

Prof. Peta Ashworth (Curtin University, Australia)

*Likely factors influencing a social license to operate for the REDEFINE H<sub>2</sub>E project:  
Including lessons from across the water*

Dr. Hans Boehm (Energieinstitut Linz, Austria)

*Holistic perspectives of a hydrogen economy*

Discussion and Q&A

12.00 **LUNCH BREAK**

13.00 **Industry Keynote**

Dr. Matti Noponen (Elcogen, Estonia)

*Elcogen, key component provider for solid oxide systems*

13:30 **Session rSOC I – Perspectives on solid oxide cell systems**

Prof. Jakub Kupecki (Institute of Power Engineering, Poland)

*Systems with reversible solid oxide cells – potential, challenges and the first lessons learnt*

Dr. André Weber (Karlsruhe Institute of Technology, Germany)

*SOC research activities at KIT*

Prof. Massimo Santarelli (Politecnico di Torino, Italy)

*Activities about Proton conducting ceramic cells (PCCC) and Chemical Looping in POLITO*

15.00 **COFFEE BREAK**

15.30 **TUM Campus Tour**

Visit of test facilities at the Chair of Energy Systems (CES)

17.30 **Evening Reception at CES**

# PROGRAM

THURSDAY, OCT 5

TIME CONTENT

- 8.30 **Welcome**  
Dr. Sebastian Fendt (Technical University of Munich, Germany / TUM REDEFINE H<sub>2</sub>E)
- 8.35 **Keynotes**  
Prof. Frank Sargent (Newcastle University, England)  
*Hydrogenases: enzymes of the past, enzymes of the future*  
Dr. Sebastian Fendt (Technical University of Munich, Germany / TUM REDEFINE H<sub>2</sub>E)  
*Electrification of biomass-to-X processes*
- 9.45 **BREAK // POSTER SESSION I**
- 10.15 **Session e-Gas I – Plasma applications in a hydrogen context**  
Prof. Sylvain Coulombe (McGill University, Canada)  
*Plasma for H<sub>2</sub>: Current state, opportunities and challenges*  
Prof. Dirk Uhrlandt (Leibniz Institute for Plasma Science and Technology, Germany)  
*Experimental studies of arcs in H<sub>2</sub> containing gases*  
Dr. Ante Hecimovic (Max Planck Institute for Plasma Physics, Germany)  
*Plasma technology for H<sub>2</sub> production and storage*  
Prof. Martin Gräbner (Technische Universität Bergakademie Freiberg, Germany)  
*Options of plasma-assisted gas production from secondary feedstock*  
Prof. Kevin J Whitty (University of Utah, USA)  
*Effective conversion of heterogenous materials into hydrogen using robust high temperature gasification*
- 12.30 **LUNCH BREAK**
- 13.30 **Session BioCat I – Biocatalysis in a hydrogen context**  
Prof. Helmut Schwab (Graz University of Technology, Austria)  
*Production of single cell protein from CO<sub>2</sub> and hydrogen by efficient gas fermentation - pilot scale studies*  
Dr. Ammar Al-Shameri (Technical University of Munich, Germany / TUM REDEFINE H<sub>2</sub>E)  
*Green hydrogen a by-product of sugar oxidation in cell-free systems*
- 14.20 **Keynote**  
Dr. Murphy Peksen (Technical University of Munich, Germany / TUM REDEFINE H<sub>2</sub>E)  
*Multiscale-multiphysics modelling of SOC - materials, components and systems*
- 14.50 **Session SLAM I – Systemic views on hydrogen**  
Andrew Steinhubl (Center for Houston's Future, USA)  
*The future of hydrogen in the Houston energy system*  
Joram Wasserfall (Society for the Advancement of Applied Computer Science, Germany)  
*Hydrogen in communal systems*  
Prof. Gilberto Jannuzzi (State University of Campinas, Brazil)  
*Advancement of renewables and hydrogen in the Brazilian energy matrix up to 2050*
- 16.00 **Closing remarks**
- 17.30 **Munich City Tour**
- 19.00 **Dinner – Augustiner Klosterwirt (City Center)**

# PROGRAM

FRIDAY, OCT 6

TIME CONTENT

- 8.30 **Welcome**  
Dr. Sebastian Fendt (Technical University of Munich, Germany / TUM REDEFINE H<sub>2</sub>E)
- 8.45 **Session e-Gas II – Enhanced gasification approaches**  
Prof. Kentaro Umeki (Lulea University of Technology, Sweden / TUM REDEFINE H<sub>2</sub>E)  
*Gasification of biomass in plasma*  
Dr. Andrius Tamosiunas (Lithuanian Energy Institute, Lithuania / TUM REDEFINE H<sub>2</sub>E)  
*Experiences of hydrogen-rich syngas from various feedstocks using thermal arc plasma gasification*  
Dr. Zach El Zahab (GTI Energy, USA)  
*R-GAS: A unique approach for entrained flow gasification*  
Dr. Massimiliano Materazzi (University College London, England)  
*Plasma-assisted gasification of waste biomass for hydrogen production: pilot and semi-commercial plant demonstration*
- 10.15 **BAVARIAN BREAKFAST // POSTER SESSION II**
- 11.15 Dr. Aleksandra Kiedrzyńska & Dr. Robert Lewtak (Institute of Power Engineering, Poland / TUM REDEFINE H<sub>2</sub>E)  
*Optimization of the plasma-assisted gasification process in an entrained-flow gasifier through CFD simulations*  
Dr. David Harris (Commonwealth Scientific and Industrial Research Organisation, Australia)  
*Hydrogen as a renewable energy carrier: Leveraging technologies and infrastructure to decarbonise global energy systems*
- 12.00 **Session BioCat II – (Electro-)Biocatalysis in a hydrogen context**  
Prof. Inês Cardoso Pereira (Universidade NOVA de Lisboa, Portugal)  
*Hydrogen production by enzyme and whole cell biohybrid systems*  
Prof. Nicolas Plumeré (Technical University of Munich, Germany)  
*Hydrogenases as catalysts in fuel cells and electrolyzers*
- 12.45 **BREAK // POSTER SESSION III**
- 13:15 **Session SLAM II – Hydrogen economy**  
Dr. Daniel Cenk Rosenfeld (Vienna University of Technology, Austria / TUM REDEFINE H<sub>2</sub>E)  
*The role of life cycle assessments in H<sub>2</sub> research*  
Prof. Svetlana Ikonnikova (Technical University of Munich, Germany)  
*The role of transportation and its CO<sub>2</sub> footprint in the H<sub>2</sub> market dynamics*  
Dr. Simon Pichlmaier (FfE, Germany)  
*How can science support the market ramp-up of hydrogen*
- 14.30 **Symposium wrap-up and closing remarks**