

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 H₂E)

10.45 **Keynotes - Setting the scene**

Prof. Peta Ashworth (Curtin University, Australia)

*Likely factors influencing a social license to operate for the REDEFINE H₂E 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 H₂E)
- 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 H₂E)
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 H₂: Current state, opportunities and challenges
Prof. Dirk Uhrlandt (Leibniz Institute for Plasma Science and Technology, Germany)
Experimental studies of arcs in H₂ containing gases
Dr. Ante Hecimovic (Max Planck Institute for Plasma Physics, Germany)
Plasma technology for H₂ 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 CO₂ and hydrogen by efficient gas fermentation - pilot scale studies
Dr. Ammar Al-Shameri (Technical University of Munich, Germany / TUM REDEFINE H₂E)
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 H₂E)
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 H₂E)
- 8.45 **Session e-Gas II – Enhanced gasification approaches**
Prof. Kentaro Umeki (Lulea University of Technology, Sweden / TUM REDEFINE H₂E)
Gasification of biomass in plasma
Dr. Andrius Tamosiunas (Lithuanian Energy Institute, Lithuania / TUM REDEFINE H₂E)
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 H₂E)
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 H₂E)
The role of life cycle assessments in H₂ research
Prof. Svetlana Ikonnikova (Technical University of Munich, Germany)
The role of transportation and its CO₂ footprint in the H₂ 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**