21st - 24th

OCTOBER 2024

MH2S

Munich Hydrogen Symposium 2024

Empowering the FUTURE with HYDROGEN

h2symposium.les@ed.tum.de

Main sponsors

ChemDelta Bavaria

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REDEFINE H2E
INTERNATIONAL FUTURE LAB

Federal Ministry of Education and Research

MH2S
Munich Hydrogen Symposium 2024

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21st - 24th

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AGENDA

MONDAY

09:00 - 11:00

REGISTRATION

WELCOME COFFEE

11:00 - 12:30

Welcome Speech
Prof. Spliethoff / Dr. Fendt

Keynote 01
Dr. Alexander Tremel

Keynote 02
tba.

LUNCH BREAK

13:30 - 15:00

PANEL DISCUSSION
Importance of Hydrogen in Future Energy Systems

COFFEE BREAK

15:30 - 17:10

M.1a
System Studies

TUESDAY

09:00 - 10:50

T.1a
Hydrogen Production

COFFEE BREAK

11:20 - 12:40

Keynote 03
Prof. Dr. Jakub Kupecki

T.2a
Synthetic Energy Carrier

LUNCH BREAK

13:40 - 15:10

T.3a
Power-to-X

COFFEE BREAK

15:30 - 17:00

REDEFINE H2E Meeting

Poster Session

CONFERENCE DINNER

WEDNESDAY

09:00 - 10:30

W.1a
Plasma Utilization

W.1b
Utilization in Biotechnology

COFFEE BREAK

11:00 - 12:20

Keynote 04
Prof. Dr. Hubert Gasteiger

W.2a
Research Projects

W.2b
Alternative Solid Feedstocks

LUNCH BREAK

13:20 - 15:10

W.3a
Gasification

W.3b
Energy Vectores & Supply Chains

COFFEE BREAK

15:30 - 17:00

W.4a
Innovative Technologies & Applications

CLOSING & AWARDS

THURSDAY

08:00 - 18:00

TOUR 1

ChemDelta Bavaria

- The ChemDelta Bavaria is one of the largest chemical sites in Germany
- Different companies will be visited
- Insight into the transformation and the application of current research in a real environment

09:00 - 17:00

TOUR 2

TUM CAMPUS TOUR

- Visit of several institutes from the fields of mechanical engineering, chemistry and process engineering
- From laboratory-scale fundamental research to demonstration plants
- Topics range from hydrogen production to technologies for closed carbon cycles

AGENDA

MONDAY 21st OCTOBER 2024

09:00 - 11:00 REGISTRATION

Registration desk open from 9-11 A.M.

WELCOME COFFEE

11:00 - 12:30 OPENING

11:00 Welcome Speech
Prof. Dr. Hartmut Spliethoff / Dr. Sebastian Fendt

11:30 Keynote 01
How Do Hydrogen Projects Become Reality?
Dr. Alexander Tremel / Acting Chief Innovation Officer / HIF Global

12:00 Keynote 02
tba.
tba.

LUNCH BREAK

13:30 - 15:00 PANEL DISCUSSION

Importance of Hydrogen in Future Energy Systems

Chair: Dr. Christian Hackl

tba.
tba. / tba.
Politics

Dr. Peter von Zumbusch
Senior Vice President / WACKER
Industry

Prof. Dr. Gerhard Kramer
Senior Vice President / TUM
Research

tba.
tba. / tba.
tba.

COFFEE BREAK

15:30 - 17:10 M.1a

H2 System Studies

Chair: Prof. Dr. Hartmut Spliethoff

15:30 Social Acceptance of Green Hydrogen in Europe
Lydia Maketo / TUM

15:50 Emissions along the Green Hydrogen Value Chain and Their Regulatory Relevance in the EU
Regina Reck / FfE

16:10 Open-Source Energy System Model for Evaluation of Gigawatt-Scale Hydrogen Production in Brazil
Simon Herzog / UnternehmerTUM

16:30 Scotland Can Meet Its 5 GW Hydrogen Target Sooner than 2030!
Arash Badakhsh / University of Strathclyde

16:50 Macroeconomic Implications of Implementing 40t Fuel-Cell Trucks: Simulation Analyses of Roll-Out Scenarios for Austria
Katharina Rusch / Energieinstitut (JKU Linz)

AGENDA TUESDAY 22nd OCTOBER 2024

09:00 -10:50 T.1a
Hydrogen Production

Chair: Dr. Stephan Herrmann

09:05 CO2 Recovery and H2 Generation by Perovskite Solar-Assisted Looping
Massimo Santarelli / Politecnico di Torino

09:25 Generating Predictive Chemical Kinetic Models for Quaternary Ammonium Degradation in Anion Exchange Membranes
Lilach Naamat / Technion - IIT

09:45 Thermal Complications in Direct Ammonia-Fed Solid Oxide Fuel Cells Elaborated by Numerical Modelling
Özgür Aydin / Karadeniz Technical University

10:05 Electrochemical Investigation of Ni-GDC Electrodes on Fuel Electrode-Supported Solid Oxide Cells
Benjamin Steinrücken / TUM

10:25 Harnessing Physics-Based AI and Multiphysics Modelling for Empowering Solid Oxide Cell Technology
Murphy Peksen / TUM

COFFEE BREAK

POSTER EXHIBITION

11:20 - 12:40 T.2a
Synthetic Energy Carrier

11:20 Keynote 03
Advancing Production of E-fuels through Pressurized Co-electrolysis in Solid Oxide Electrochemical Cells
Prof. Dr. Jakub Kupecki / Director of the Institute of Power Engineering – National Research Institute

Chair: Dr. Sebastian Fendt

11:50 Hydrogen and Syngas Retrieval from Methanol with Electrically Heated Steam Reforming Reactors
Marcelo Dal Belo Takehara / Luleå Unversity of Technology

12:10 Particle Circulation in a New Reactor Concept for Sorption-Enhanced Fischer-Tropsch Synthesis
Wiebke Asbahr / KIT

LUNCH BREAK

AGENDA

TUESDAY

22nd OCTOBER 2024

13:40 - 15:10 T.3a

Power-to-X

Chair: Prof. Dr. Jakub Kupecki

13:40 **Power-to-X Technologies for a Sustainable Future**
Sebastian Pichler / MAN Energy Solutions

14:00 **Power-to-X: From Cement Flue Gas to Value Added Products**
Alexander Beck / Net Zero Emission Labs

14:20 **Design Parameter Optimization of a Membrane Reactor for Methanol Synthesis Using a Sophisticated CFD Model**
Theresa Hauth / TUM

14:40 **A Predictive Chemical Kinetic Model for Hydrazine Decomposition**
Michal Keslin / Technion - IIT

POSTER EXHIBITION

COFFEE BREAK

15:30 - 17:00
Internal Project Meeting
REDEFINE H2E
Team &
Strategic Advisory Board Meeting

15:10 - 17:00
POSTER SESSION
List can be found
at the end of the document

CONFERENCE DINNER

The FACULTY Restaurant & Bar, next to the conference center

AGENDA WEDNESDAY 23rd OCTOBER 2024

09:00 - 10:30 PARALLEL SESSION

W.1a Plasma Utilization

Chair: Prof. Dr. Kentaro Umeki

09:00
A 50 kW Arc-Heated Plasma Torch for Hydrogen and Carbon Production via Methane Pyrolysis and for the Electrification of High Temperature processes
Hamid Reza Yousefi / PlasmaAir AG

09:20
Plasma Reforming Technologies for Low Carbon Hydrogen Production
Bader Alrasheed / Uni College London

09:40
Green Hydrogen as an Alternative for Sustainable Glass Production
Nerijus Stirūgas / Lithuanian Energy Institute

10:00
Integration of electrically assisted processes coupled with the use of Hydrogen in the Glass-Making Industry
Andrius Tamosiunas / Lithuanian Energy Institute

W.1b Biotechnology

Chair: Prof. Dr. Volker Sieber

09:00
Hydrogen-Driven Isobutanol Production
Tenuun Bayaraa / TUM Campus Straubing

09:20
Hydrogen-Driven Synthesis of Chemicals in Whole Cells
Ammar Al-Shameri / TUM Campus Straubing

09:40
Hydrogen-Driven Isobutanol Production
Mayla Schulz / TUM Campus Straubing

10:00
Hydrogen-Driven Synthesis of Chemicals in Whole Cells
Dominik Siebert / TUM Campus Straubing

COFFEE BREAK

11:00 Keynote 04
R&D Challenges for Global-Scale Proton Exchange Membrane (Pem) Based Water Electrolysis
Prof. Dr. Hubert Gasteiger / Head of Chair of Technical Electrochemistry / TUM

11:35 - 12:20 PARALLEL SESSION

W.2a Research Projects

Chair: Dr. Sebastian Fendt

11:35
H2-Reallabor Burghausen: Transformation of the Chemical Industry Towards a Hydrogen-Based Circular Economy
Christian Hackl / Reallabor gGmbH

11:55
Synergyfuels: Where the Bioeconomy Meets the Hydrogen Economy
Júnior Staudt / TUM Campus Straubing

W.2b Alternative Solid Feedstocks

Chair: tba.

11:35
Waste-to-Methanol: Techno-economic Comparison of Promising Methanol-Production Processes from Municipal Solid Waste
Sebastian Bastek / TUM

11:55
High-Purity Hydrogen Production from Bark via Dual Fluidized Bed Steam Gasification
Veronica Gubin / TU Wien

LUNCH BREAK

AGENDA WEDNESDAY 23rd OCTOBER 2024

13:20 - 15:10 PARALLEL SESSION

W.3a Gasification

Chair: tba.

13:20
Entrained Flow Gasification of Circular Raw Materials in the Swedish Chemical Industry
Frederik Weiland / RISE

13:40
Kinetics of Biomass Devolatilization with Thermal Plasma
Kentaro Umeki / Luleå Unversity of Technology

14:00
Numerical Simulations of Plasma-Assisted Biomass Gasification in a Vertical Entrained Flow Gasifier
Robert Lewtak / Institute of Power Engineering – NRI

14:20
Characterizing Solid Fuel Particle Behavior in Thermal Plasma Flows: Insights from CFD Simulations
Aleksandra Kiedrzynska / Institute of Power Engineering – NRI

W.3b Energy Vectors and Supply Chains

Chair: Prof. Dr. P.V. Aravind

13:20
Dimethyl Ether as a Potential Vector for Large-Scale Hydrogen Import: Leveraging LNG Terminals for Hydrogen Import
Patrick Preuster / University of Applied Science Rosenheim

13:40
Hydrogen and Ptx Fuel Logistics for Optimized Sustainable Aviation Fuel Production for Bavaria
Leonard Moser / Bauhaus Luftfahrt

14:00
A Concept for Data-Driven Decision Support in Renewable Hydrogen Supply Chains
Julian Stang / TUM

14:20
Circular Economy Strategies for Green Electrolyzer Supply Chains
Sarah Hasslacher / TUM Campus Straubing

COFFEE BREAK

15:30 - 17:00 W.4a Innovative Technologies and Applications

Chair: Prof. Dr. Johannes Völkl

15:30 **Techno- Economic and Profitability Assessment of Stand-Alone Photoelectrochemical Hydrogen Generation Technology**
Chun Ting Yang / Fraunhofer CSP

16:10 **Optimal RES-Electrolyser Coupling- A Flexible Technoeconomic Assesment Tool**
Nikolaos Skordoulias / NTUA

15:50 **Utilization of Oxygen from Water Electrolysis for Applications in the Chemical Industry**
Farnaz Badavi / University of Applied Science Rosenheim

16:30 **Reflecting the Potential Role of Redefine Technologies in Future Low-Emission Energy System**
Iryna Doronina / TUM

CLOSING & AWARDS

AGENDA THURSDAY 24th OCTOBER 2024

Technical Tours

Please note:
The registration for the technical tour can be made via Converia

ChemDelta Bavaria

08:00
Meeting point in Garching in front of conference centre

08:15
Transfer to Gendorf

10:00 - 12:00
Visit of Westlake Vinnolit in Gendorf

12:00 - 14:00
Lunch break and transfer to Burghausen

14:00 - 16:00
Visit of WACKER Chemie in Burghausen

16:00
Transfer back to Garching (arrivial before 18:00)

- **The ChemDelta Bavaria is one of the largest chemical sites in Germany and only a short bus ride away from the conference venue**
- **Different companies will be visited**
- **Insight into the transformation and the application of current research in a real environment**

TUM Campus Tour

09:30
Meeting point in Garching in front of conference centre

10:00 - 11:30
Max Planck IPP, nuclear fusion reactor

12:00 - 12:30
Chair of Energy Systems (Lab tour SOC)

12:30 - 13:30
Lunch break and networking

14:00 - 14:30
Chair of Energy Systems (Demo plants)

15:00 - 16:00
Chair of Technical Electrochemistry (Lab tour PEM)

- **Tour includes several institutes from the fields of mechanical engineering, chemistry and process engineering**
- **It covers everything from laboratory-scale fundamental research to demonstration plants**
- **Topics range from hydrogen production to technologies for closed carbon cycles**

AGENDA POSTER

22nd OCTOBER 2024

Novel Definition of Renewable Energy and Sustainable Hydrogen Potential
Alina Kerschbaum

Optimization of Manifold Design to Minimize Thermal Gradients within a Solid Oxide Fuel Cell (SOFC) Stack
Chen Lin

Few layer MoS2 as a catalyst for the hydrodeoxygenation of fatty acids to alkanes
Fuli Deng

Investigations on Ce-doping of NiAlOx Catalysts for CO2 Methanation
Heike Plendl

Investigating the Influence of Thermal Plasma on Biomass Particles
Johannes Waßmuth

Experimental Comparison of Plasma-Assisted Entrained Flow Gasification and Conventional Entrained Flow Gasification in a Pilot-Scale Gasifier
Jonas Brandstetter

Dynamic Operation and Optimization of a Containerized Pilot Plant for CO2-Based Methanol Production
Lukas Anthofer

Investigating Pyrolysis for Sustainable Waste-to-X Solutions
Lukas Martetschläger

Biomass-to-Liquid Opportunities: Sustainable Aviation Fuel from Queensland's Sugar Industry
Marcel Dossow

Structural Optimization of an ideal Chemical Park towards CO2 Neutrality
Maximilian Kerschbaum

CFD Modeling of Plasma-Assisted Entrained Flow Gasification
Sebastian Willhelm

Waste-to-X: Two-Step Process for Thermochemical Recycling of Municipal Solid Waste and its Characterization
Simon Meillinger

Development and Design of a Pressurized Test Rig for Reversible Solid-Oxide Short Stacks
Sören Ohmstedt

Electrolysis vs. Battery: Flexibility dynamics in Europe’s energy system amid varying renewable expansion rates
Stephan Mohr

Development of a Dynamic Carbon Capture and Utilization Pilot Plant
Svenja Knösch

Power-to-X: Process Modeling and Assessment of Pathways to Produce Sustainable Aviation Fuel
Vincent Eyberg