

h2symposium.les@ed.tum.de



## **A ChemDelta Bavaria**

#### chemdelta-bavaria.de

## Zreallabor burghausen

reallabor-burghausen.de

Supporting sponsor

**FF** Reverion

**Presented by** 

Technische Universität München









## Munich Hydrogen Symposium 2024





END

A

#### **OCTOBER 2024**

	MON	IDAY	October, 21 <sup>st</sup>		
9:00 - 11:00	)				
REGISTRATION					
from 9-11 a m					
	WELCOM	E COFFEE			
11:00 - 12:30	0				
OPENING					
11:00	Welcome Speech Prof. Dr. Gerhard Kramer - Ser	nior Vice President	: / TUM		
11:10	Opening Speech Prof. Dr. Hartmut Spliethoff -	Head of Chair of E	nergy Systems / TUM		
11:30	Keynote 01		0		
	Dr. Alexander Tremel - Deputy	Chief Innovation	? Officer / HIF Global		
12:00	Keynote 02				
	A Swiss Perspective on Sus	tainable Fuels ar ler Reactors and R	nd Platform Chemicals		
	LUNCH	BREAK			
13:30 - 15:0	0				
	PANEL DIS	SCUSSION			
Heat Dr. Chi	Importance of Hydrogen i	in Future Energy S	Systems		
HOSE: Dr. Chi					
Sen	ior Vice President / WACKER	Associate Profe Energy Markets	ssor / TUM Center for		
	Dr. Lars Eiermann	Dr. Alexander	Tremel		
Managing Director / TUM Venture Labs Deputy Chief Innovation Officer / HIF Global					
COFFEE BREAK					
15:30 - 17:20	0				
Chair Drof	H2 System S	tudies (M.1a)			
15:30	Social Acceptance of Greer	Hydrogen in Eu	rope		
	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 Syster Scale Hydrogen Production Simon Herzog / Unternehmer	m Model for Eva in Brazil TUM	luation of Cigawatt-		
16:30	Scotland Can Meet Its 5 GW Hydrogen Target Sooner than 2030! Arash Badakhsh / University of Strathclyde				
16:50	Climate Neutral Chemistry Geert Cremers / Sitech	Inspired by Cher	nelot		





**TUESDAY** 

October, 22<sup>nd</sup>

9:00 - 10:30		
	H	
Chair: Dr. S	tephan Herrmai	
09:05	CO2 Recov	

Hydrogen Production (T.1a)				
Chair: Dr. Stephan Herrmann				
09:05	CO2 Recovery and H2 Generation by Perovskite Solar-Assisted Looping Massimo Santarelli / Politecnico di Torino			
09:25	Thermal Complications in Direct Ammonia-Fed Solid Oxide Fuel Cells Elaborated by Numerical Modelling Özgür Aydin / Karadeniz Technical University / TUM			
09:45	Electrochemical Investigation of Ni-GDC Electrodes on Fuel Electrode-Supported Solid Oxide Cells Benjamin Steinrücken / TUM, Chair of Energy Systems			
10:05	Macroeconomic Implications of Implementing 40t Fuel-Cell Trucks: Simulation Analyses of Roll-Out Scenarios for Austria Katharina Rusch / Energieinstitut (JKU Linz)			

#### **COFFEE BREAK**

11:00 - 12:30

Synthetic Energy Carrier (T.2a)

11:00	Keynote 03 Advancing Production of E-fuels through Pressurized Co- electrolysis in Solid Oxide Electrochemical Cells Prof. Dr. Jakub Kupecki - Director / Institute of Power Engineering - National Research Institute	
Chair: Dr. S	ebastian Fendt	
11:35	Hydrogen and Syngas Retrieval from Methanol with Electrically Heated Steam Reforming Reactors Marcelo Dal Belo Takehara / Luleå Unversity of Technology	
11:55	Particle Circulation in a New Reactor Concept for Sorption- Enhanced Fischer-Tropsch Synthesis Wiebke Asbahr / KIT	

LUNCH BREAK

13:30 - 15:00

#### Power-to-X (T.3a)

Chair: Prof	f. Dr. Jakub Kupecki		
13:30	Design Parameter Optimization of a Membrane Reactor for Methanol Synthesis Using a Sophisticated CFD Model Theresa Hauth / TUM, Chair of Energy Systems		
13:50	Power-to-X: From Cement Flue Gas to Value Added Products Alexander Beck / Net Zero Emission Labs		
14:10	Power-to-X Technologies for a Sustainable Future Sebastian Pichler / MAN Energy Solutions		
14:30	Electrification of Biomass and Waste-to-X Processes Sebastian Fendt / TUM, Chair of Energy Systems		



### OCTOBER 2024 **COFFEE BREAK** 15:30 - 17:00 15:10 - 17:00 **Internal Project Meeting POSTER SESSION** Team & Poster list can be found Strategic Advisory Board at the end of the document Meeting 18:00 **RECEPTION & CONFERENCE DINNER** The FACULTY Restaurant & Bar, next to the conference center



#### WEDNESDAY

October, 23rd

#### **PARALLEL SESSION**

#### 09:00 - 10:30

09.00

**Processes** 

Plasma Utilization (W.1a)

A 50 kW Arc-Heated Plasma Torch

via Methane Pyrolysis and for the Electrification of High Temperature

for Hydrogen and Carbon Production

Plasma Reforming Technologies for

Green Hydrogen as an Alternative for

Integration of Electrically Assisted

Processes Coupled with the Use of

Hydrogen in the Glass-Making

**Sustainable Glass Production** 

Low Carbon Hydrogen Production Bader Alrasheed / Uni College London

Chair: Prof. Dr. Kentaro Umeki

#### Biotechnology (W.1b)

Chair: Prof. Dr. Volker Sieber

09:00

Hydrogenases in Fuel Cells and Electrolyzers Nicoals Plumeré / TUM Straubing

#### 09:20

Hydrogenases in the Hydrogen Economy - Perspectives and Challenges Ammar Al-Shameri / TUM Straubing 09:40 Hydrogen Driven Isobutanol

Production Tenuun Bayaraa / University of Queensland

Power-to-X-to-Y: Expanding Powerto-X and CCU by Industrial Biotechnology Integration Jonathan Fabarius / Fraunhofer igb

#### **COFFEE BREAK**

#### 11:00

Industry

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

11:35 - 12:20

#### **Research Projects (W.2a)**

#### Chair: Prof. Dr. Hartmut Spliethoff

H<sub>2</sub>-Reallabor Burghausen: Transformation of the Chemical Industry Towards a Hydrogen-Based Circular Economy

Lhristian Hacki / Realiabor gumbh l<mark>1:55</mark>

Synergyfuels: Where the Bioeconomy Meets the Hydrogen Economy

#### PARALLEL SESSION

#### Alternative Solid Feedstock (W.2b)

Chair: Dr. Fredrik Weiland 11:35

Waste-to-Methanol: Technoeconomic 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

#### 13:20 - 15:10

Chair: Dr. Sebastian Fendt

**Entrained Flow Gasification of** 

**Kinetics of Biomass Devolatilization** 

Numerical Simulations of Plasma-

Assisted Biomass Gasification in a

**Vertical Entrained Flow Gasifier** 

Robert Lewtak / Institute of Power

Characterizing Solid Fuel Particle

**Insights from CFD Simulations** 

**Behavior in Thermal Plasma Flows:** 

**Circular Raw Materials in the** 

**Swedish Chemical Industry** 

with Thermal Plasma

#### **PARALLEL SESSION**

#### Gasification (W.3a)

#### Energy Vectors and Supply Chains (W.3b)

Chair: Dr. Florian Kerscher

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

A Concept for Data-Driven Decision Support in Renewable Hydrogen Supply Chains Laura Göbel / TUM, iwb

#### 14:20

Circular Economy Strategies for Green Electrolyzer Supply Chains Sarah Hasslacher / TUM Straubing

#### COFFEE BREAK

#### 15:30 - 17:00

#### Innovative Technologies and Applications (W.4a) Chair: Prof. Dr. Johannes Völkl 15:30 **Reflecting the Potential Role of Redefine Technologies in Future** Low-Emission Energy System Irvna Doronina / TUM 15:50 **Optimal RES-Electrolyser Coupling- A Flexible Technoeconomic Assessment Tool** Nikolaos Skordoulias / NTUA 16:10 Utilization of Oxygen from Water Electrolysis for Applications in the Chemical Industry Kajetan Mühlböck / University of Applied Science Rosenheim 16:30 Techno- Economic and Profitability Assessment of Stand-Alone Photoelectrochemical Hydrogen Generation Technology

17:00 - 17:30

**Closing and Awards** 



# **DCTOBER 2024**

#### THURSDAY

#### October, 24th

#### **TECHNICAL TOURS**

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

#### TOUR 01 ChemDelta Bavaria

#### 08:00

Meeting point in Garching in front of the conference center

Transfer to Gendorf

Welcome and introduction of Gendorf Chemical Park

#### 10:45

Guided tour of the Gendorf Chemical Park and tour of the Westlake Vinnolit chlor-alkali electrolysis plant 12:00

Lunch in the Chemical Park canteen 13:15

Transfer to Wacker Chemie Burghausen

#### 14:00

Visit of WACKER Chemie in Burghausen

#### 16:00

Transfer back to Garching (arrivial before 18:00)

Important information: for safety reasons, please wear closed shoes and clothing (normal shoes - no sandals, no shorts or short sleeves)

#### TOUR 02 TUM Campus Tour

#### 09:30

Meeting point in Garching in front of the conference center

LRZ (Leibniz-Rechenzentrum)

Lunch break and networking

3:00

Chair of Energy Systems (lab tour SOC)

14:00

Chair of Energy Systems (demo plants)

#### 15:00

Chair of Technical Electrochemistry (lab tour PEM)



**OCTOBER 2024** 

# **DCTOBER 2024**

## AGENDA

#### **POSTER SESSION**

Novel Definition of Renewable Energy and Sustainable Hydrogen Potential Alina Kerschbaum

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

Facilitation of Machine Learning Methods for Waste Plastic Pyrolysis 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 Wilhelm

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 Ohmsted

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

Chemelot Integrated Model System "CIMS" Zowi Maijer

