

Public Final Project Conference and Workshops

Hybrid event: On-site conference in Berlin
and Webex remote participation (link upon registration)

Date July 3rd–5th, 2023

Location Bundesanstalt für Materialforschung und -prüfung (BAM)
Richard-Willstätter-Str. 11
12489 Berlin, Germany

Local Contact Dr. Michael Maiwald
michael.maiwald@bam.de, Phone: + 49 30 8104-1149

Registration **Registration (step 1 for all participants)**

- Please register via [link](#) on MefHySto homepage or directly the QR code
- Deadline extended to 30.06.2023
- You can register for on-site as well as remote participation
- You can register scientific posters and exhibition booths



Registration (step 2 only for on-site participation)

- Please register via link <https://express.converia.de/frontend/index.php?sub=1208>
- Participants who registered in step 1 are informed by e-mail,
- On-site registration site will allow payment for planned contribution to costs for on-site participation (55 € including VAT)

All information on www.mefhysto.eu



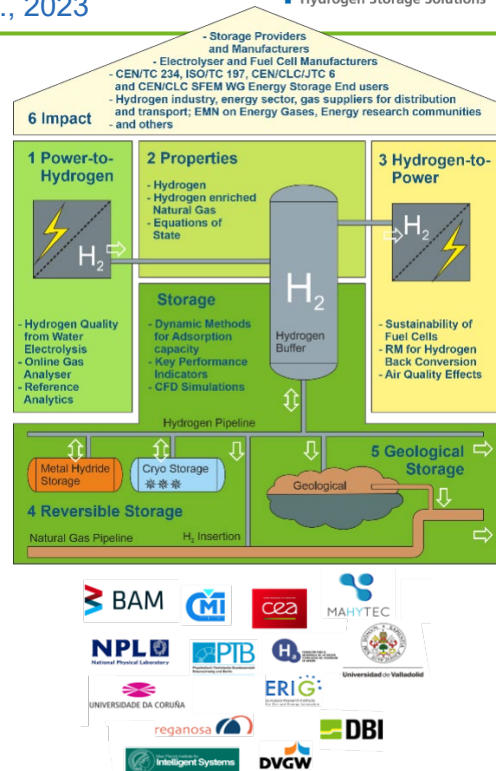
The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

The European project MefHySto addresses the need of large-scale energy storage, which is required for a shift to renewable energy supply. Large-scale energy storage is required to supply energy at peak times when renewable sources fluctuate. A possible solution for energy storage is large-scale use of hydrogen.

The project is funded by the European Metrology Programme on Innovation and Research (EMPIR) and consists of 14 consortium partners from all over Europe. Duration 2020–2023. EU Funding 2.3 M€. MefHySto ends in August 2023.

The conference offers a unique opportunity to receive the results of the project in overview presentations and in-depth workshops. The program is aimed at experts and also newcomers to this topic area. The active participation of PhD students is especially welcome. Posters can be registered until, 21.06. There will also be an instrument exhibition (registration until 21.06. free of charge).

Confirmed participants from: (last update: June 27th, 2023)



<ul style="list-style-type: none"> • Austrian Institute of Technology und die Universität für Bodenkultur (AIT-BOKU), Eggersdorf, Austria • Aragon Hydrogen Foundation, Huesca, Spain • Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany • Christ University, Trivandrum, Kerala, India • CENAM, El Marqués, Qro., Mexico • Commissariat à l'Énergie Atomique et aux Énergies Alternatives, Grenoble, France • Cluster of Bioeconomy and Environment of Western Macedonia (CLuBE), Kozani, Greece • Czech Metrology Institute, Brno, Czech Republic • Danish Gas Technology Centre, Hoersholm, Denmark • DBI Gas- und Umwelttechnik GmbH, Leipzig, Germany • Dresser Utility Solutions GmbH, Karlsruhe, Germany • European Research Institute for Gas and Energy Innovation (ERIG), Brussels, Belgium • Font Corporation & RAVEN SR, Zaragoza, Spain • Gaz-Ssystem S.A., Warszawa, Poland • Helmholtz-Zentrum Hereon, Institut für Wasserstofftechnologie, Geesthacht, Germany 	<ul style="list-style-type: none"> • Korea Research Institute of Standards and Science, Daejeon, The Republic of Korea • Mahytec, Dole, France • Max-Planck-Institut für Intelligente Systeme, Stuttgart, Germany • Measurement Canada, Ottawa, Ontario, Canada • Michell Instruments Limited - Process Sensing Technologies (PST), Cambridgeshire, United Kingdom • National Physical Laboratory UK, Teddington, United Kingdom • New Energy Coalition, Groningen, The Netherlands • ONTRAS Gastransport GmbH, Leipzig, Germany • RAG Austria AG, Wien, Austria • Robert Bosch GmbH, Stuttgart, Germany • Ruhr-Universität Bochum, Bochum, Germany • Siemens AG, Karlsruhe, Germany • Snam SpA, San Donato Milanese, Italy • TU Chemnitz / Applied Thermodynamics, Chemnitz, Germany • University of Valladolid, Valladolid, Spain • University of A Coruña, Analytical Chemistry, A Coruña, Spain • WIVA P&G, Linz, Austria • JP-ProteQ, Berlin, Germany
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Program (last update: June 26st, 2023)

Day 1: Monday, July 3 rd 2023		
12:00–13:00	Welcome and light lunch	
13:00–13:20	Opening – MefHySto in the framework of European research initiatives	<u>Dr. Michael Maiwald</u> , coordinator MefHySto, Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany
13:20–13:35	Opening – The European Metrology Network Energy Gases	<u>Dr. Marcel Workamp</u> , Secretary EMN Energy Gases, VSL, Delft, The Netherlands
13:35–13:50	Opening – Hydrogen Europe Research	<u>Louis Mazurkiewicz</u> , Innovation Manager, Hydrogen Europe Research, Brussels, Belgium
13:50–14:00	Housekeeping	<u>Dr. Michael Maiwald</u>
14:00–16:00	Posters, Exhibition, Coffee	all
16:00–16:10	New metrology for Hydrogen Quality from Power-to-Hydrogen and from Electrical Energy Storage (HEES) by Hydrogen Back Conversion (Gas-to-Power)	<u>Paul Carroll</u> , National Physical Laboratory, London, UK and <u>Fabrice Micoud</u> , Commissariat à l'Énergie Atomique et aux Énergies Alternatives, Grenoble, France
16:10–16:20	Assuring Safety and Quality of Hydrogen production	<u>Stephan Zuijendorp</u> , Global Sales, Process Sensing Technologies, Ely, United Kingdom
16:20–16:30	Metrology for Hydrogen Vehicles2 – Overview of project achievements	<u>Dr. Thomas Baquart</u> , National Physical Laboratory, London, UK
16:30–17:30	Workshop (Quality from Water Electrolysis, Online Gas Analysis, Reference Analytics, Impact of Impurities on Fuel Cells, Reference Materials, Air Quality Effects)	Experts from the MefHySto consortium
16:30	Introduction to workshop	<u>Paul Carroll</u> , National Physical Laboratory, London, UK
16:30–16:50	Topic 1: Electrolysers / effects of impurities on fuel cells. 10 minute presentation followed by panel discussion.	<u>Jonathan Goh</u> , National Physical Laboratory, London, UK and <u>Fabrice Micoud</u> , Commissariat à l'Énergie Atomique et aux Énergies Alternatives, Grenoble, France

Day 1: Monday, July 3 rd 2023 <i>continued</i>		
16:50–17:10	Topic 2: Online Gas Analysis for quality measurement / reference analytics. 10 minute presentation followed by panel discussion.	<u>Paul Carroll</u> , National Physical Laboratory, London, UK
17:10–17:30	Topic 3: Reference material production / reference analytics. 10 minute presentation followed by panel discussion.	<u>Ziyin Chen</u> , <u>Dr. Thomas Baquart</u> , National Physical Laboratory, London, UK and <u>Dr. Dirk Tuma</u> , BAM, Berlin, Germany
17:30–18:00	Wrap-up/Outlook Power-to-Hydrogen and Hydrogen Back Conversion	all
18:00–19:30	Check-in, private transfer to conference dinner	
19:30	Conference Dinner	For on-site participants Private transfer to conference dinner

Day 2: Tuesday, July 4 th 2023		
08:30–09:00	Welcome coffee	
09:00–09:10	Large-Scale Storage of Gases in Geological Storage Facilities	<u>Dipl.-Chem. Udo Lubenau</u> (DBI Gas und Umwelttechnik GmbH, Leipzig, Germany)
09:10–09:20	"Gas quality measurements for hydrogen storage" (working title)	<u>Dr. Achim Zajc</u> , MeterQ Solutions GmbH, Butzbach, Germany
09:20–09:30	Impulse Lecture2	N.N.
09:30–10:30	Workshop (Different types of underground storage, Analytical and measurement technology, CFD simulations, Flow metering)	Experts from the MefHySto consortium
10:30–11:00	Wrap-up/Outlook	all

<i>Day 2: Tuesday, July 4th 2023 continued</i>		
11:00–13:30	Coffee, Posters, Exhibition Lunch	all
13:30–13:40	Metrology for Reversible Hydrogen Storage Technologies Metal hydride storage and cryo-storage in metal-organic frameworks, MOFs	<u>Maximiliano Melnichuk</u> , Mahytec SAS, France and <u>Dr. Michael Hirscher</u> , Max-Planck-Institut für Intelligente Systeme, Stuttgart, Germany
13:40–13:50	Impulse Lecture1	N.N.
13:50–14:00	Impulse Lecture2	N.N.
14:00–15:00	Workshop (Dynamic methods for adsorption capacity, Storage key performance indicators)	Experts from the MefHySto consortium
15:00–15:30	Wrap-up/Outlook	all
15:30–16:30	Posters, Exhibition, Coffee	all
16:30–17:30	Panel Discussion ”Traceable solutions for advanced hydrogen storage technologies – MefHySto progress and future tasks”	<u>Hans Rasmusson</u> , Secretary General European Research Institute for Gas and Energy Innovation (ERIG), Brussels, Belgium – moderator Experts from the MefHySto consortium Invited guests
17:30	End of Day 2	

Day 3: Wednesday, July 5th 2023		
08:30–09:00	Welcome coffee	all
09:00–09:10	Thermophysical Properties of Hydrogen obtained from Electrolysis, Hydrogen injected in Gas Grids, and Hydrogen under Geological Storage Conditions	<u>Dr. David Vega-Maza</u> Universidad de Valladolid, UVa, Spain
09:10–09:20	Impulse Lecture: "Hydrogen flow measurements – current status and challenges"	<u>Dr.-Ing. Hans-Benjamin Böckler</u> , Physikalisch-Technische Bundesanstalt (PTB), Head of Working Group 1.45 „hydrogen quantity metering“
09:20–09:35	Impulse Lecture: "Fundamentals of Equations of State"	<u>Dr. Eric W. Lemmon</u> , National Institute of Standards and Technology, USA (NIST). Thermophysical Properties of Fluids Group
09:35–10:00	Impulse Lecture: "Equations of State for Hydrogen Mixtures – An Overview" <ul style="list-style-type: none"> • Hydrogen as a well-known pure fluid? • Applications of hydrogen mixtures and the resulting activities at RUB • EOS in terms of the Helmholtz energy for mixtures + modeling approaches • Results for selected binary mixtures with hydrogen 	<u>Dr.-Ing. Monika Thol</u> Thermodynamik, Fakultät für Maschinenbau, Ruhr-Universität Bochum, Germany (RUB)
10:00–10:30	Workshop <ul style="list-style-type: none"> • Thermophysical Properties of H₂ enriched natural gas mixtures. • Density and Speed of Sound of H₂ + C₃H₈ binary mixtures • Panel Discussion 	<u>Dr. David Vega-Maza</u> UVa, Spain <u>Dr. Eric W. Lemmon</u> , NIST, USA <u>Dr.-Ing. Monika Thol</u> RUB, Germany Experts from the MefHySto consortium
10:30–11:00	Wrap-up/Outlook	all
11:00–12:00	Coffee, Posters, Exhibition	all
12:00–12:30	Wrap-up Poster prizes Closing	<u>Dr. Michael Maiwald</u> (BAM)
12:30–13:30	Lunch Boxes, farewell	all
13:30	End of Conference	

Exhibitor List (last update: June 26 th , 2023)
European Research Institute for Gas and Energy Innovation – ERIG a.i.s.b.l., Rue Belliard 40, 1040, Brussels, Belgium
Projekt Optical Gas Spectrometer, Robert Bosch GmbH, 70442 Stuttgart, Germany
Process Sensing Technologies PST GmbH, Friedrichsdorf, Germany
JP-ProteQ, Berlin, Germany

Poster List (last update: June 26 th , 2023)		
Poster	Title	Affiliation
1	Thermophysical properties of hydrogen obtained from electrolysis, hydrogen injected in the gas grids and hydrogen under geological storage conditions	<u>David Vega-Maza</u> , University of Valladolid, Valladolid, Spain
2	ZIF-8 a Robust Material for Cryo-adsorbed Hydrogen Storage and its Reproducibility in an Interlaboratory Test	Jose A. Villajos, Rafael Balderas-Xicohtencatl, <u>Isabella Fackelmann*</u> , Jose Casabán, Dennis Wong, Michael Maiwald, and Michael Hirscher *Max-Planck-Institut für Intelligente Systeme, Stuttgart, Germany
3	ZIF-8 Pellets for an Interlaboratory comparison study	Jose A. Villajos, Rafael Balderas-Xicohtencatl, <u>Isabella Fackelmann*</u> , Jose Casabán, Dennis Wong, Michael Maiwald, and Michael Hirscher *Max-Planck-Institut für Intelligente Systeme, Stuttgart, Germany
4	Raman Spectroscopy – A Swiss Army Knife for Thermophysical Property Research?	<u>Fabian Luther</u> , Markus Richter, Professur Technische Thermodynamik, Technische Universität Chemnitz, Chemnitz, Germany
5	Metrology for Hydrogen Quality from Electrical Energy Storage by Hydrogen Back Conversion (Gas-to-Power) – (MefHySto WP3)	<u>Fabrice Micoud</u> , Commissariat à l'Énergie Atomique et aux Énergies Alternatives, Grenoble, France
6	Direct reduction of New Zealand sands to hydrogen storage material	Alexander Haack, Helmhotz-Zentrum Hereon, Institut für Wasserstofftechnologie, Geesthacht, Germany
7	Large-Scale Storage of Gases in Geological Storage Facilities (MefHySto WP5)	MefHySto Consortium: DBI Gas und Umwelttechnik GmbH, Germany, et al.

Poster	Title	Affiliation
8	Coupling of high-temperature metal hydride (MgH₂) with low-temperature metal hydride (LaNi₅H₆) for thermal energy storage.	<u>Phutthimet Thongtan</u> , Helmholtz-Zentrum Hereon, Institut für Wasserstofftechnologie, Geesthacht, Germany
9	Metrology for Reversible Hydrogen Storage Technologies – Metal Hydride Storage, Cryo Storage (MefHySto WP4)	MefHySto Consortium: MAHYTEC SAS, France, et al.
10	Review of adsorptive hydrogen storage on porous materials at low temperatures	<u>Maria-Sophie Günther</u> , TU Chemnitz / Applied Thermodynamics, Chemnitz, Germany
11	HyWaBe – Revision of the German standard DIN 18453 and expansion to include hydrogen	<u>Christoph Sulberg</u> , Ruhr-Universität Bochum, Bochum, Germany
12	Wasserstoffinitiative Austria Power & Gas (working title)	<u>Margherita Matzer</u> , WIVA P&G, Linz, Österreich
13	Hydrogen Quality from Power-to-Hydrogen (working title)	<u>Jonathan Teik Ean Goh</u> , National Physical Laboratory, Teddington, UK
14	About the impact of impurities on PEM fuel cell stack performance	<u>Sylvie Escribano</u> , Commissariat à l'Énergie Atomique et aux Énergies Alternatives, Grenoble, France
15	Thermophysical Properties of H₂ and H₂-enriched natural gas (MefHySto WP2)	MefHySto Consortium: Universidad de Valladolid, Spain, et al.
16	Metrology for Hydrogen Quality from Power-to-Hydrogen (MefHySto WP1)	MefHySto Consortium: National Physical Laboratory, United Kingdom, et al.
17	Challenges with transitioning from natural gas to H₂ in the gas transport pipeline system: Gas quality and repurposing of pipelines in a Danish perspective	<u>Bela Sebok</u> , Danish Gas Technology Centre (DGC), Denmark
18	Large-Scale Synthesis of ZIF-8 for Hydrogen Storage: Batch and Continuous Modes	¹ <u>Nikita Gugin</u> , ¹ Jose Villajos, ² Olivier Dautain, ¹ Michael Maiwald, ¹ Franziska Emmerling, ¹ Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany and ² École Nationale Supérieure de Chimie de Lille Centrale, Villeneuve d'Ascq, France
19	Modeling of methane-hydrogen mixture in pipe	<u>Stanislav Knotek</u> , Czech Metrology Institute, Brno, Czech Republic
20	Hydrogen TDLAS for Applications from Feedstock to Energy	Viacheslav Avetisov, Ove Bjørøy, Jonas Westberg, Peter Geiser, NEO Monitors AS, Norway
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