Next Generation ELECTROLYSERS

International Conference

08-09 December 2020 Technical Program I online only

An online technical conference with 15 selected industry and research perspectives on the development, deployment and industrial integration of large-scale electrolysers.

With contributions by the following companies and institutions:

- **Cummins**
- **Evonik**
- **FCH JU**
- **Fraunhofer IFAM**
- **Hydrox Holdings**
- **HySA Infrastructure**
- **Johnson Matthey**
- **Nouryon**
- **NTNU Hydrogen**
- **PV3 Technologies**
- **SINTEF**
- **Sunfire**
- **thyssenkrupp**
- **Vattenfall**
- **Verbund**

At this online event, you will have the chance to:

- Learn about latest developments and improvements of scaled-up ALK, PEM, AEMEL and SOEC units
- Discuss how to further increase efficiency and cut costs by improving design, materials and manufacturing processes
- Gain a profound insight into the challenges of scaling up industrial production of electrolyser components
- Get the latest news about ongoing electrolyser application projects in different industries
- Explore case studies on the integration of large-scale electrolysers into existing plants, processes and value chains

To register: registration@bluedelta.net

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Board of Speakers

Christian Bernäcker
Group Manager Electrochemical Technology
Fraunhofer IFAM, Germany

Dmitri Bessarabov
Director: DSI National Center of Competence: Hydrogen Infrastructure
HySA Infrastructure, South Africa

Thijs de Groot
Innovation Technologist, Competence Team Technology Industrial Chemicals
Nouryon, The Netherlands

Malcolm Gillespie
Research and Development Specialist
Hydrox Holdings, South Africa

Lukas Lüke
Head of Product Order Execution Department
thyssenkrupp, Germany

Nikos Lymperopoulos
Project Officer
Fuel Cells and Hydrogen Joint Undertaking, Belgium

Artjom Maljusch
Project Manager Advanced Membrane Materials
CREAVIS | Science & Technology
Evonik Operations, Germany

Robert Paulnsteiner
Hydrogen Technologist
Verbund, Austria

Bruno G. Pollet
Leader of NTNU Team Hydrogen
President of the Green Hydrogen Division of the **International Association for Hydrogen Energy (IAHE), Norwegian University of Science and Technology (NTNU), Norway**

Oliver Posdziech
Head of Large Systems
Sunfire, Germany

Denis Thomas
Global Business Development Leader - Water electrolysis
Cummins Inc., Belgium

Nick van Dijk
Chief Technology Officer
PV3 Technologies, United Kingdom

Oliver Weinmann
Managing Director
Vattenfall Europe Innovation, Germany

Chris Zalitis
Senior Scientist
Johnson Matthey, United Kingdom

Federico Zenith
Senior Research Scientist
SINTEF Mathematics & Cybernetics, Norway

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International Conference — Technical Program I online only

Conference Day One | Tuesday, December 08 Topics and Speakers	UTC -5 Toronto New York	UTC 0 London Lisbon	UTC +1 Berlin Madrid	UTC +2 Helsinki Johannesburg
Opening of the conference: A welcome from the organizer	06:55	11:55	**12:55**	13:55
Green Hydrogen - A Utility Perspective • Why green hydrogen • Business opportunities and challenges • Requirements for electrolysers **Oliver Weinmann** **Managing Director** **Vattenfall Europe Innovation, Germany**	07:00	12:00	**13:00**	14:00
Kickstarting an Arctic Hydrogen Valley: the Haeolus project • Exploiting stranded wind resources • Path from hydrogen commercialisation in the local economy to export • Coordination with local and regional authorities **Federico Zenith** **Senior Research Scientist** **SINTEF Mathematics & Cybernetics, Norway**	07:30	12:30	**13:30**	14:30
FCH JU support to the development of electrolysers in the EU • An overview of the FCH JU support to the workhorse of renewable hydrogen production will be presented that includes 38 projects supported with 135 MEuro over a period of 13 years • Large scale demonstrations have moved from 1 to 20MW of ALKEL or PEMEL in a period of 5 years, with FCH JU support falling 10times per MW of electrolyser installed • Support also provided to research on game-changer concepts like high pressure and current density PEM or upscaling AEMEL also supported • SOEL have moved to MW scale, with some being reversible units **Nikos Lymperopoulos** **Project Officer** **Fuel Cells and Hydrogen Joint Undertaking, Belgium**	08:00	13:00	**14:00**	15:00
Coffee & Networking Break	08:30	13:30	**14:30**	15:30

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Advances, Opportunities and Challenges of Hydrogen Production from Seawater Electrolysis • About "NTNU Team Hydrogen" • Short overview of water electrolysis • Overview of state-of-the-art catalysts in seawater electrolysis • Opportunities and challenges of hydrogen generation from seawater **Bruno G. Pollet** **Leader of NTNU Team Hydrogen** **President of the Green Hydrogen Division of the International Association for Hydrogen Energy (IAHE)** **Norwegian University of Science and Technology (NTNU), Norway**	09:00	14:00	**15:00**	16:00
Technological drivers for innovation in large scale alkaline water electrolysis • Electrolysis has gained technological maturity for large application in a renewable environment • Scalability via standardization is key • Cost competitiveness can be reached by improvement in cost structure and increased production capacity **Lukas Lüke** **Head of Product Order Execution Department** **thyssenkrupp, Germany**	09:30	14:30	**15:30**	16:30
Coffee Break & Networking	10:00	15:00	**16:00**	17:00
Water Electrolysis Development at HySA Infrastructure in South Africa • About HySA: Strategic framework, relevant projects and applications • Technology gaps impeding large-scale adoption of solid poly-electrolyte (SPE) membrane water electrolysis • Overview of state-of-the-art (SOA) technology **Dmitri Bessarabov** **Director: DSI National Center of Competence: Hydrogen Infrastructure HySA Infrastructure, South Africa**	10:30	15:30	**16:30**	17:30
Development of advanced alkaline water electrolysis technologies in South Africa • Development of a home-grown zero-gap water electrolysis stack and system • Membraneless water electrolysis – A unique way of pushing the boundaries and environments for water electrolysis • A 15kW demonstration of the DEFTTM membraneless alkaline water electrolysis concept **Malcolm Gillespie** **Research and Development Specialist** **Hydrox Holdings, South Africa**	11:00	16:00	**17:00**	18:00
End of conference day one	11:30	16:30	**17:30**	18:30

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Conference Day Two | Wednesday, December 09 Topics and Speakers	UTC -5 Toronto New York	UTC 0 London Lisbon	UTC +1 Berlin Madrid	UTC +2 Helsinki Johannesburg
Opening of Conference Day Two: Welcome from the organizer	03:55	08:55	**09:55**	10:55
Technical challenges and opportunities in scaling up alkaline water electrolysis • Nouryon's expertise in large scale electrolysis: overview in current projects • Reducing costs for green hydrogen: upscaling and technical innovation • Significant potentials of alkaline technology: increasing current density and flexibility • Important technical aspects: optimal module size, flexibility limitations, safety, electrode and diaphragm development, degradation rate, leak currents, etc. **Thijs de Groot** **Innovation Technologist, Competence Team Technology Industrial Chemicals, Nouryon, The Netherlands**	04:00	09:00	**10:00**	11:00
Scalable electrode production technologies for the alkaline water electrolysis: overview and outlook • Alkaline electrolysis • Electrode production on large scale • Dimensionale stable electrodes **Christian Bernäcker** **Group Manager Electrochemical Technology** **Fraunhofer IFAM, Germany**	04:30	09:30	**10:30**	11:30
Coffee Break & Networking	05:00	10:00	**11:00**	12:00
Status of High-Temperature Electrolysis for the Generation of Green Hydrogen and Syngas • Basics of HTE technology • Typical applications for HTE • Technological maturity **Oliver Posdziech** **Head of Large Systems** **Sunfire, Germany**	05:30	10:30	**11:30**	12:30
Hydroxide Conducting Membrane for Water Electrolysis – Enabling Technology for Cost Competitive Production of Decarbonized Hydrogen • AEMEL to combine advantages of current state-of-the-art technologies PEM and AEL • AEMEL as new technology to significantly reduce electrolyzer investment costs and raw material criticality • Development of high performance anion exchange polymers and membranes as key components to realize AEMEL • EU-funded project (H2020) CHANNEL will deliver first AEMEL stack demonstrator on kW-scale **Artjom Maljusch** **Project Manager Advanced Membrane Materials** **CREAVIS | Science & Technology, Evonik Operations, Germany**	06:00	11:00	**12:00**	13:00

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Conference Day Two | Wednesday, December 09 Topics and Speakers	UTC -5 Toronto New York	UTC 0 London Lisbon	UTC +1 Berlin Madrid	UTC +2 Helsinki Johannesburg
Large scale PEM Electrolysis: status and way forward • PEM water electrolysis technology development at Cummins • Return of experience from operating units • Case study: 20 MW PEM water electrolysis plant in Canada • How to bring the PEM technology to the next level ? **Denis Thomas** **Global Business Development Leader - Water electrolysis** **Cummins Inc., Belgium**	06:30	11:30	**12:30**	13:30
Coffee Break & Networking	07:00	12:00	**13:00**	14:00
A perspective of the challenges in scaling up CCM production for PEM electrolysis • CCM production for PEM electrolysis • How fuel cell technology can help with electrolysers • Future perspectives for large scale implementation **Chris Zalitis** **Senior Scientist** **Johnson Matthey, United Kingdom**	07:30	12:30	**13:30**	14:30
Advanced Coatings for PEM Water Electrolysers • the value of coatings to reducing the cost of hydrogen production • the mechanism of corrosion protection • the capabilities of PV3 Technologies **Nick van Dijk** **Chief Technology Officer** **PV3 Technologies, United Kingdom**	08:00	13:00	**14:00**	15:00
H2Future – Green Hydrogen from a 6MW High Performance PEM electrolyzer • Green Hydrogen for the steel industry including grid services • Operation experiences of a 6MW PEM electrolyzer • Sector coupling via green hydrogen for industrial decarbonisation **Robert Paulnsteiner** **Hydrogen Technologist** **Verbund, Austria**	08:30	13:30	**14:30**	15:30
End of conference: Goodbye from the organizer	09:00	14:00	**15:00**	16:00

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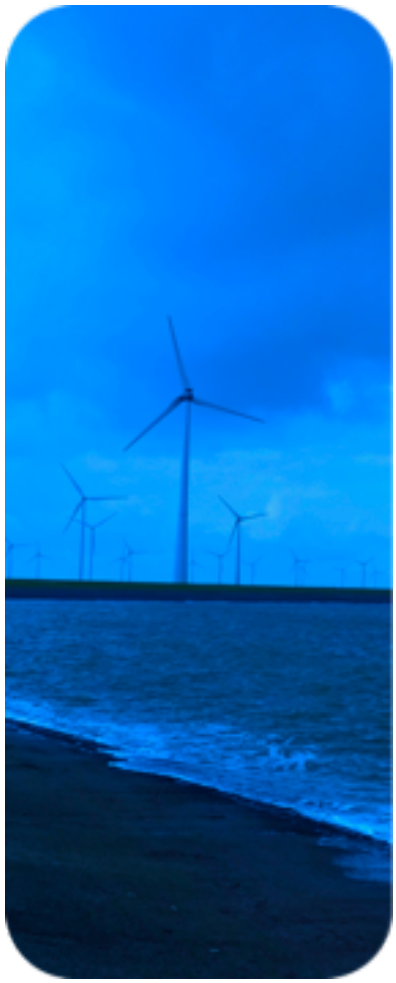

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