



Towards sustainable and green aviation fuel production

## KEROGREEN organised “Winter school” in collaboration with E-Fuel, BECCU and EERA JP Energy Storage



### Future directions in research on Power-to-X for sustainable chemicals & fuels

10-11 February 2022

Online event Zoom

Chair: Prof. Roland Dittmeyer, Karlsruhe Institute of Technology, DE

Thursday 10<sup>th</sup> February 2022

9:00 – 9:10	Opening Winter school and Welcome (R. Dittmeyer)
	<i>Chair morning session: Juha Lehtonen, VTT</i>
9:10 – 9:35	<b>EU Project KEROGREEN: Main Challenges and first results</b> Adelbert Goede, DIFFER (NL)
9:35 – 10:00	<b>Plenary presentation of E-Fuel and BECCU Projects</b> Juha Lehtonen, VTT (FI)
10:00 – 10:25	<b>Status of modular plants for decentralised Power-to-X</b> Michael Rubin (Klump), KIT (DE)
10:25 – 10:45	Coffee break
10:45 – 12:05	<b>Oral presentations</b> <ul style="list-style-type: none"><li>- Vanesa Gil, Aragon Hydrogen Foundation: Air Carbon Recycling for Aviation Fuel Technology</li><li>- Jan-Willem K�onemann, TNO: Take-Off a novel process to synthetic aviation fuel</li><li>- Christian Frilund, VTT: CO<sub>2</sub> conversion to hydrocarbons using reverse water gas shift and FT-synthesis</li><li>- Esperanza Ruiz, CIEMAT: Process intensification for advancing Power-to-Fuel</li></ul>
12:05 – 13:05	Lunch break
	<i>Chair afternoon session: Francisco Vidal V�azquez, KIT</i>
13:05 – 14:05	<b>Oral presentations</b> <ul style="list-style-type: none"><li>- Mihalis Tsampas, DIFFER: Synergistic combination of plasma and electrocatalysis for nitrogen fixation by water</li><li>- Stefan Welzel, DIFFER: CO<sub>2</sub> plasmolysis in the KEROGREEN process chain: Development of a plasma reactor module for CO production</li><li>- Marijke Jacobs, VITO: Development of thin electrode layers by spray coating for solid oxide cells</li></ul>

This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under grant agreement No 763909.





**14:05 – 14:25**    **Coffee break**

**14:25 – 15:45**

**Oral presentations**

- Marjut Suomalainen, VTT: Techno-economic assessment of producing diesel from CO<sub>2</sub> and H<sub>2</sub>O via co-electrolysis and Fischer-Tropsch synthesis
- Vafa Järnefelt, VTT: The potential of CCU technologies in mitigating climate change
- Miia Nevander, VTT: Techno-economics of the synthesis route from CO<sub>2</sub> and clean H<sub>2</sub> to polycarbonate polyols
- Joachim Falkenhagen, Windland Energieerzeugungs GmbH: Green Future Quota” for power-to-X fuels like green hydrogen and kerosene

**16:00**

**End of 1<sup>st</sup> day**





Friday 11<sup>th</sup> February 2022

9:00	<b>Start 2<sup>nd</sup> day</b>
	<i>Chair morning session: Roland Dittmeyer, KIT</i>
9:00 – 9:30	<b>Invited plenary presentation: The role of hydrogen and hydrogen-derived fuels in the IEA Net Zero Emissions 2050 roadmap</b> Ilkka Hannula, IEA (FR)
9:30 – 10:50	<b>Oral presentations</b> <ul style="list-style-type: none"><li>– Emil Drazevic, Arhus University: Decentralized production of green and sustainable ammonia – insights from EU/Japan collaboration</li><li>– Onni Linjala, VTT: CO<sub>2</sub> supply options for P2X and results from carbon capture experiments</li><li>– Sari Rautiainen, VTT: Fossil-free polycarbonate polyols from captured carbon dioxide and renewable hydrogen</li><li>– Dorela Dharmo, KIT: Defossilizing the aviation sector with synthetic fuels (poster)</li></ul>
10:50 – 11:10	<b>Coffee break</b>
11:10 – 12:30	<b>Oral presentations</b> <ul style="list-style-type: none"><li>– Peter Holtappels, DTU: Organic Electrosynthesis: a sustainable route to polymers and other high value chemicals?</li><li>– Mikko Lappalainen, VTT: State-of-the-art and future mapping of electrolyser technologies</li><li>– Ville Saarinen, VTT: High temperature electrolysis and co-electrolysis for production of green hydrogen and syngas</li><li>– Mery Hernandez, KIT: Plasma assisted H<sub>2</sub>O<sub>2</sub> synthesis from water and oxygen</li></ul>
12:30 – 13:30	<b>Lunch break</b>
13:30	<b>EERA JP Energy Storage “PhD day”</b>
	<i>Chair afternoon session: Adelbert Goede, DIFFER</i>
13:30 – 13:40	<b>Introduction to the session</b> Adelbert Goede, DIFFER (NL)
13:40 – 15:00	<b>Oral PhD presentations</b> <ul style="list-style-type: none"><li>– Tabea Stadler, KIT: Syngas Production in the Kerogreen Process Chain: Development of a compact Sorption-Enhanced Water-Gas Shift Reactor</li><li>– Georgios Sakas, LUT University: Dynamic energy and mass balance model for an industrial alkaline water electrolyzer plant process</li><li>– Aki Braunschweiler, VTT: Light olefin production from CO<sub>2</sub></li><li>– Manuel Andresh, KIT: Quantitative model-based assessment of global socio-ecological challenges and opportunities for the transition to Power-to-X: Case study for the aviation sector</li></ul>
15:00 – 15:20	<b>Coffee break</b>
15:20 – 15:40	<b>Virtual visits to research infrastructures (KIT, VTT)</b>
15:40 – 15:50	<b>AWARD decision</b>
15:50 – 16:00	<b>Closing words of PhD day &amp; Winter school (A. Goede, R. Dittmeyer)</b>

