Programme

AAU ENERGY RESEARCH DAY

ePower-to-X: FROM IDEA TO INNOVATION AND IMPACT

Tuesday, 25 April 2023

AAU Innovate - Science & Innovation Hub, Thomas Manns Vej 25, 9220 Aalborg East

AAU ENERGY

AALBORG UNIVERSITY

08:30 - 09:30	**Registration**
09:00 - 09:30	**Coffee and Breakfast Rolls**
09:30 - 09:35	**Welcome** *Vice-Head of AAU Energy, Professor Birgitte Bak-Jensen*
09:35 - 10:00	**Production of SOEC Electrolyzer Stacks for Green Hydrogen and Production of Green Ammonia and E-Methanol** *Kim Grøn Knudsen, Topsoe A/S, Chief Innovation & Strategy Officer*
10:00 - 10:25	**Diving Below Zero GHG Emissions: How the Energy Transition and Industrial Transformation Can Deliver on Climate Targets, Circularity and Sound Economics** *André Faaij, Director of Science TNO Energy Transition & Professor, Utrecht University*
10:25 - 10:50	**PtX Converter Design and Control** *Niels Gade, Danfoss Power Electronics A/S, Director of Innovation*
10:50 - 11:10	**Break**
11:10 - 12:30	**SESSION 1: ePOWER-TO-X: INFRASTRUCTURE** *Pontoppidanstraede 111, room 1.177 (Auditorium), organised by Filipe Faria da Silva*
11:10 - 11:25	**AIM Toolbox** *Heng Wu*
11:25 - 11:40	**The Combined Green Pipe-Cable: Shared Transmission of Gas and Electricity** *Hanchi Zhang*
11:40 - 11:55	**From Power to Hydrogen: Unlocking the Economic Potential of Electrolyzers in Local integrated Energy Systems** *Sina Ghaemi*
11:55 - 12:00	**Break to Relocate to Other Sessions if Desired**
12:00 - 12:15	**Energy Systems for Defence and Agriculture** *Simon Sahlin*
12:15 - 12:30	**Primary Control Interface Software for Planning of Multiterminal HVDC** *Filipe Faria da Silva*

This event is organised in cooperation with Energy Cluster Denmark and IDA Energy

11:10 - 12:30	**SESSION 2: ePOWER-TO-X: COMPONENTS** *Thomas Manns Vej 25, café area, organised by Huai Wang*
11:10 - 11:25	**Reducing e-fuel Production Cost by Increasing Electrolysis Temperature** *Søren Højgaard Jensen*
11:25 - 11:40	**Discussions on Dynamic Characteristics for Electrolysis and E-Fuel Production** *Xiaoti Cui*
11:40 - 11:55	**The Effect of a Turbulence Grid on the Performance of an Air-Cooled Proton Exchange Membrane Fuel Cell** *Torsten Berning*
11:55 - 12:00	**Break to Relocate to Other Sessions if Desired**
12:00 - 12:15	**Medium Voltage Components and Power Converters First Experiences** *Stig Munk-Nielsen*
12:15 - 12:30	**Power Electronics for PtX** *Pooya Davari*
11:10 - 12:30	**SESSION 3: ePOWER-TO-X: INTEGRATION AND PROCESSES** *Pontoppidanstraede 105, room 4.127, organised by Daniele Castello*
11:10 - 11:25	**Utilization of Organic Resources and Microbial Electrochemistry for Green Hydrogen Production** *Tanmay Chaturvedi*
11:25 - 11:40	**Assessing the Integration Potential of Using Direct Air Capture Technologies as Carbon Source for P2X** *Sebastian Bruhn Petersen*
11:40 - 11:55	**Energy System Integration of Renewable Fuel Production Pathways in Denmark and How to Systematically Determine Optimal Site Locations** *Andreas Krogh*
11:55 - 12:00	**Break to Relocate to Other Sessions if Desired**
12:00 - 12:15	**Ammonia Fuel for Hydrogen Storage & Transport - the HySTrAm Project** *Vincenzo Liso*
12:15 - 12:30	**Pathways to Effective and Affordable Carbon Capture** *Larry Baxter*
12:30 - 13:00	**Lunch and Poster Session** *Café and hall area*

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12:30 - 14:30	13:00 - 14:30	13:15 - 14:15
POSTER SESSION	**PITCH EVENT**	**LABORATORY TOUR**

12:30 - 14:30 Poster Session

Café and hall area

Detailed programme for the PhD Poster Session on the next page

13:00 - 14:30 Pitch Event

Thomas Manns Vej 25, room C009

Invited guests and additional seats allocated on a first come, first served basis

13:00 - 13:30 **RelyPES: A Software Tool for Risk Assessment in Renewable-Based Electric Power Systems,** by Saeed Peyghami

13:30 - 14:00 **PEMC: Power Electronics Electromagnetic Interference Pre-Compliance Software Tool,** by Pooya Davari

14:00 - 14:30 **Intelligent Energy Systems for Defence and Private Applications,** by Simon Lennart Sahlin

13:15 - 14:15 Laboratory Tour

Meeting point: Entrance C of the Science and Innovation Hub.

Information available at registration, for external guests only

The pick-up time for the lab tour is 13:10

14:30 - 15:30 Panel Discussion

Thomas Manns Vej 25, café area

Kim Grøn Knudsen, Topsoe A/S, Chief Innovation & Strategy Officer
André Faaij, Director of Science TNO Energy Transition & Professor, Utrecht University
Niels Gade, Danfoss Power Electronics A/S, Director of Innovation
Steen Hintze, CEO, Greenport North
Søren Knudsen Kær, Head of Technology, Power-to-X at European Energy A/S
Preben Birr-Pedersen, IDA PtX expert

15:30 - 15:35 Closing Remarks

Head of AAU Energy, Professor Lasse Rosendahl

15:35 - 16:00 Refreshments

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POSTER SESSION

Title	Author
3D Thermal Modeling of 10kV SiC-MOSFET Power Modules	Masaki Takahashi
ML-Based Fast Inductance Estimation	Pawel Piotr Kubulus
Integrated Design of Microgrids Considering Reliability and Stability	Ali Azizi
Impact of Machine-Side Converter Dynamics on AC Impedance of Grid-Forming PMSG Wind Turbines	Shiyi Liu
MMC-Connected Power System Stability Assessment Based on AI	Wentao Liu
Physics Informed Machine Learning for Lithium-ion Batteries	Wendi Guo
Degradation Test of HT-PEM Fuel Cells Under Start-Stop Cycling and Load Cycling Conditions	Mengfan Zhou
Gradient Based End of Life Criterion of Power Semiconductor Modules	Yichi Zhang
Modeling and Control of Multi-Port DC/DC converter for Offshore Wind Farm Application	Shahriar Farajdadian
An Improved Model Predictive Control for DC/DC Converters	Yuan Li
Optimal Sizing of Behind-the-Meter Battery Storage for Providing Profit-Oriented Stackable Services	Yichao Zhang
Seamless Transitions Between the Grid-Following and the Grid-Forming Control	Xian Gao
Short Circuit Capability and Performance Degradation of Cascode GaN devices –A Case Study	Zhebie Lu

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Sensitivity Analysis of Energy Management Strategies Under Variable Data Resolution	Xiangqiang Wu
Medium-Voltage DC Chopper Enabled by 10kV SiC MOSFET	Zhixing Yan
Digital Design-Based Power Electronics Packaging Reliability Analysis	Zhongchao Sun
Embedded Current Sensor for SiC Die Current Measurement	Janus Meinert
Energy Management Strategy for Smart Homes Based on Deep Reinforcement Learning	Kuangpu Liu
SOH Estimation Accuracy Comparison and Improvement of Lithium-ion Battery Based on the Different Voltage Segments with Different Data Size	Xingjun Li
Condition Monitoring for Electric Drive System in EVs	Xing Wei
Partial Discharge Test and Analysis in Direct Bond Copper Substrate	Yuan Gao
Thermal Stress Emulation of Power Devices Subject to DFIG Wind Power Converter	Xinming Yu
A High-Voltage Active Capacitor with Adaptive Parameter Capability	Zhihao Lin
A Robust Parameter Design Method of Desaturation Protection Circuit for SiC MOSFETs	Jiahong Liu
Machine Learning Based Surrogate Models for Heatsink Optimization	Ziheng Wang
Design Guidelines to Reduce Parasitic Capacitance of Planar Inductor	Shaokang Luan
Microbial Electrolysis for Valorization of Acetate-Rich Side Streams in Organic Waste Treatment	Daniel Lopez
Sensorless State of Temperature Estimation for Smart Battery based on Electrochemical Impedance	Yusheng Zheng

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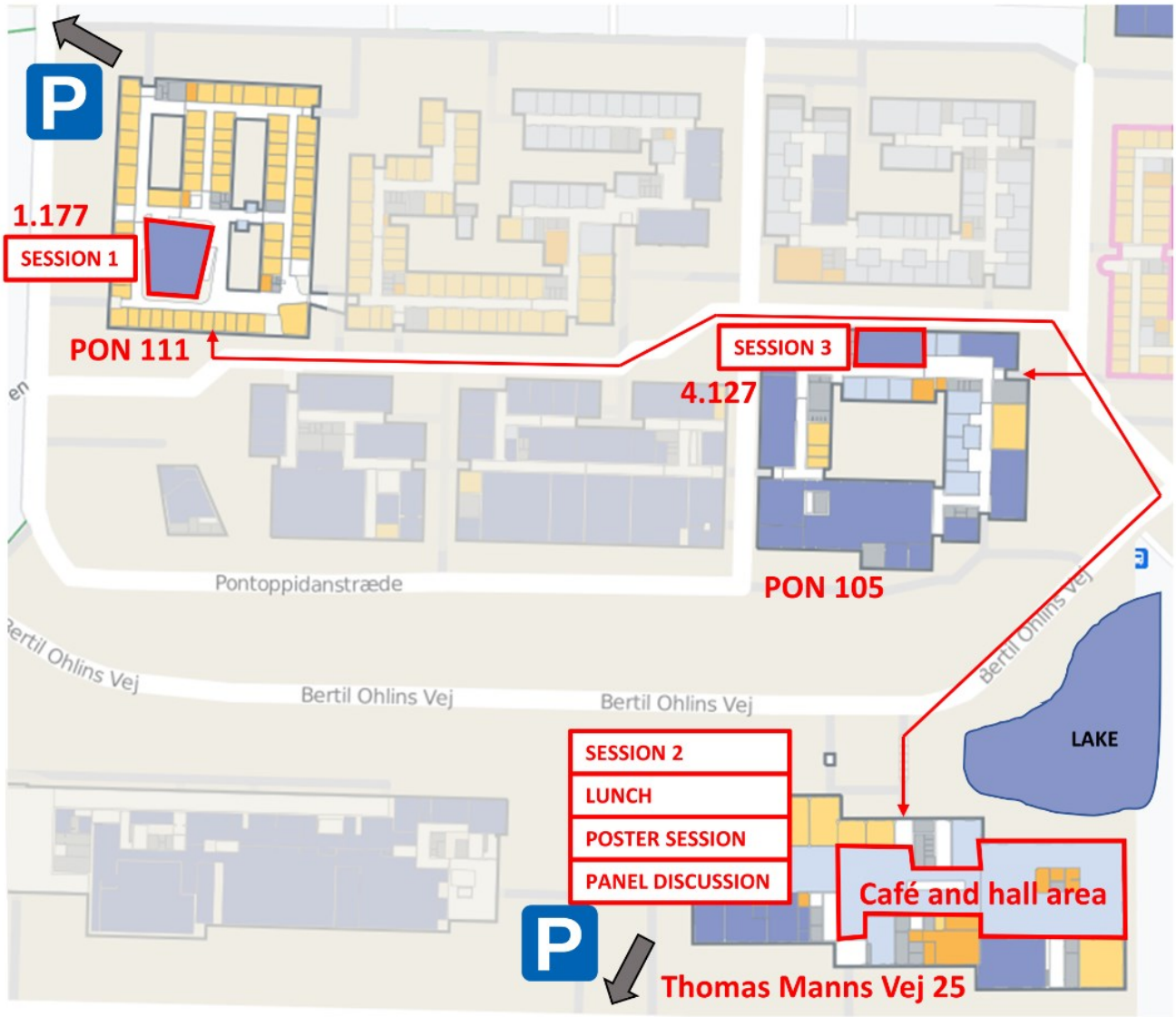
PRACTICAL INFORMATION

AAU Energy - guest wifi

Scan the QR-code to the left to connect to the event's wireless network: sacs95brown

AAU Map



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UPCOMING EVENTS AT AAU ENERGY

June 6th – **CORPE 10th Annual Symposium**

AAU Energy, Pontoppidanstraede 111, 9220 Aalborg East

Internationally recognized speakers from industry and academia present their views on challenges in power electronics reliability; oral and poster presentations about the research findings from CORPE; discussion about the strategic roadmap and tours in the laboratories.

https://www.energy.aau.dk/2023-06-06-corpe-annual-symposium-2023-e69938

September 4th–6th – **Energy Camp**

AAU Energy, Esbjerg Campus at Niels Bohrs Vej 8, 6700 Esbjerg

Companies, researchers, and students get together to encourage new ways to solve the challenges of green transition.

www.energy.aau.dk

September 4th–8th – **EPE 2023 & ECCE Europe**

AKKC – Aalborg Congress and Culture Center

The 25th European Conference on Power Electronics and Applications, and Energy Conversion Congress and Expo Europe. Focus on renewable energy systems and Power-to-X, Energy Islands, Energy-storage technologies, Electric Vehicles, Cyber Security in Power Electronics and Reliability and Artificial Intelligence in Power Electronics.

https://epe2023.com/

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