

Newsletter n° 6

August 2023

# NEWSLETTER

EPE' **23** ECCE Europe



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## EPE Association: Join EPE or renew your membership



- ✓ Be part of a network of recognized experts
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- ✓ Online access to EPE-PEMC Conference Proceedings
- ✓ Reduced registration fees for EPE Conferences
- ✓ Online access to EPE Journal articles
- ✓ EPE Secretariat service
- ✓ And much more ...

**Join EPE Association**

## EPE'23 ECCE Europe: REGISTRATION

Don't wait any longer, REGISTER TODAY:

- Please find the (updated) registration conditions [HERE](#) and [HERE](#).

**Registration website**

## Technical programme

The detailed technical programme is published on the conference website:

<https://epe2023.com/detailed-technical-programme/>

<http://epe2023-aalborg.com/detailed-technical-programme/>



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## Final programme

The file of the final programme booklet is available on the conference website::

[https://epe2023.com/wp-content/uploads/EPE\\_23\\_Final\\_Programme\\_Booklet\\_LR.pdf](https://epe2023.com/wp-content/uploads/EPE_23_Final_Programme_Booklet_LR.pdf)

[http://epe2023-aalborg.com/wp-content/uploads/EPE\\_23\\_Final\\_Programme\\_Booklet\\_LR.pdf](http://epe2023-aalborg.com/wp-content/uploads/EPE_23_Final_Programme_Booklet_LR.pdf)

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## Tutorials

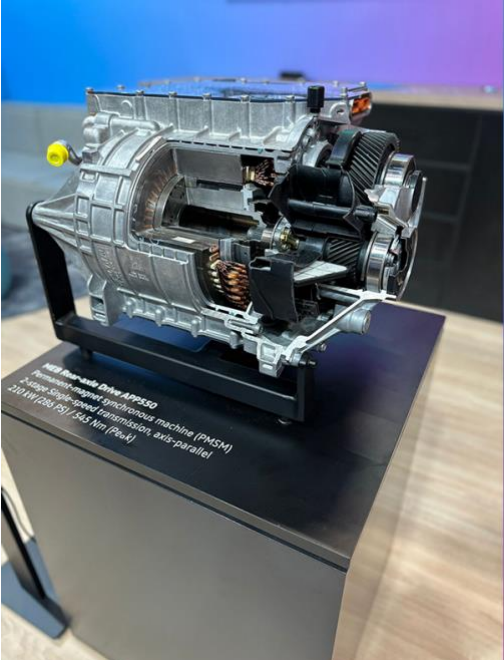
The tutorials will take place on Monday, 4 September 2023 and on Friday 8 September 2023, in the AKKC in Aalborg.

Full tutorial programme:

- *Tutorial 1 - **Second-Life EV Batteries for Renewable and Smart Grid Storage Applications** (Monday afternoon)*
- *Tutorial 2 - **Recent Advancements on High-Power DC/DC Converters for DC Transmission and Distribution** (Monday afternoon)*
- *Tutorial 3 - **SiC MOSFET Gate Drivers for High-Power Applications** (Friday morning)*
- *Tutorial 4 - **Solid State Transformers: Topologies, Use Cases, Design Considerations, and Challenges** (Monday morning)*
- *Tutorial 6 - **Switching Loss Measurements in Power Semiconductors** (Monday afternoon)*
- *Tutorial 7 - **Fundamentals and Advancements of Modern High-frequency Magnetic Components** (Monday morning)*
- *Tutorial 8 - **Advanced control of industrial medium-voltage multi-phase wind power conversion systems** (Monday full day)*
- *Tutorial 10 - **Grid-Forming Converters: Principles and Practices** (Monday full day)*
- *Tutorial 13 - **Multi-sampling control of power electronic converters** (Friday afternoon)*




- **Tutorial 14 - Intelligent BMS** (Monday full day)
- **Tutorial 17 - Challenges and Perspectives of Medium Voltage SiC MOSFETs (>6kV) in Power Electronic Converters** (Monday morning)
- **Tutorial 19 - EV Charging: Power Conversion, Quality, and Digitalization** (Monday morning)
- **Tutorial 20 - Reliability and Prognostics Towards Lifetime Improvement of Automotive Power Electronics** (Monday afternoon)
- **Tutorial 24 - Planar Magnetics for On Board Chargers and others** (Monday afternoon)
- **Tutorial 25 - Design of High-Performance Power Electronic Motor Drives using State-of-the-Art Wide Bandgap Devices** (Monday afternoon)



Help us to push  
**power electronics**  
to the **next level.**

Join the team  
and become a  
**Pulsemaker!**




## Keynotes

The programme of the keynotes at EPE'23 ECCE Europe is:



### **Keynote 1**

#### [Power-to-X: Optimizing X for a Sustainable Society](#)

*Adrian Timbus, Head of Portfolio and Market Strategy at Hitachi Energy*

### **Keynote 2**

#### [Energy Islands – the key to harvest huge amounts of wind power](#)

*Hanne Storm Edlefsen, Vice President of the Energy Islands, Energinet*



### **Keynote 3**

#### [LMNO: high-voltage spinel as Li-ion battery cathode. Status and battery properties](#)

*Søren Dahl, Topsoe*

### **Keynote 4**

#### [Power Electronics in Electric Vehicles: It's not only about cost](#)

*Kunal Goray, AVL-Software and Functions GmbH*





### **Keynote 5**

#### Advanced SiC Power Modules for E-Mobility

*Fabio Carastro, Semikron Danfoss*

### **Keynote 6**

#### Net-Zero-Co2 by 2050 is NOT Enough!

*Johann Kolar, Power Electronic Systems Laboratory, ETH Zurich*



Keynote lectures: <https://epe2023.com/keynote-speakers/>



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## Focus Topics & Industrial forums

### Industrial Forum 1 - Renewable Energy Systems and Power-to-X

Tuesday 5 September 2023: 17:00 – 18:10

<https://epe2023.com/focus-topic-1-renewable-energy-systems-and-power-to-x/>

### Industrial Forum 2 - Energy Islands

Tuesday 5 September 2023: 17:00 – 18:10

<https://epe2023.com/focus-topic-2-energy-islands/>

### Industrial Forum 3 - Energy-storage Technologies

Wednesday 6 September 2023: 17:00 – 18:10

<https://epe2023.com/focus-topic-3-energy-storage-technologies/>

### Industrial Forum 4 - Electric Vehicles

Wednesday 6 September 2023: 17:00 – 18:10

<https://epe2023.com/focus-topic-4-electric-vehicles/>

### Industrial Forum 5 - Emerging Power Electronics Devices and Semiconductors

Thursday 7 September 2023: 16:30 – 17:40

<https://epe2023.com/emerging-power-electronic-devices-and-semiconductors/>

### Industrial Forum 6 - Reliability and Artificial Intelligence in Power Electronics

Thursday 7 September 2023: 16:30 – 17:40

<https://epe2023.com/focus-topic-6-reliability-and-artificial-intelligence-in-power-electronics/>

## Vendor Sessions

Planning vendor sessions			
Timing	Tuesday 5 September	Wednesday 6 September	Thursday 7 September
11.10 - 11.25		Hioki Europe	ZES Zimmer Electronic Systems GmbH
11.30 - 11.45	Leapers Semiconductor	ModelingTech	
11.50 - 12.05	Current OS	MathWorks	Frenetic
12.10 - 12.25	GOmeasure	Plexim GmbH	
12.30 - 12.45		Hitachi Energy	
12.50 - 13.05	Typhoon HIL, Inc	Omicron Lab	dSPACE
13.10 - 13.25	Danfoss & Semikron Danfoss	EGSTON Power Electronics	Infratec GmbH
13.30 - 13.45	Nexperia	OPAL-RT Technologies	
13.50 - 14.05	Wolfspeed	Volkswagen	
14.10 - 14.30	Schneider Electric		

### Tuesday 05 September

#### 11.30-11.45 Leapers Semiconductor

##### IGBT and SiC Power Solutions for Mature and Emerging Power Electronics Applications

*Alexey Cherkasov, Marketing & Sales Director*

In the age of the growing electrical power demand, every industry is focusing on the efficient power conversion solutions – from power grids and railways to the emerging vehicle electrification and photovoltaics. With its core research and development center in Japan and production capacity expansion in China, Leapers Semiconductor corresponds to the continuous demand for both Si and SiC power solutions with its latest advances in power semiconductors technology.

#### 11.50-12.05 Current OS

#### 12.10-12.25 GOmeasure

#### 12.50-13.05 Typhoon HIL, Inc

### **13.10-13.25 Danfoss & Semikron Danfoss**

#### **Efficient and Intelligence Drives of the Future**

*Norbert Hanigovszki*

This talk will look at the historical trends of drives and how these effect what a future drive will look like and in particular, what is possible in the areas of efficiency and intelligence

### **13.30-13.45 Nexperia**

#### **High-voltage, high-power components for requirements of next generation applications**

*Sebastian Fahlbusch, Application Marketing Manager*

This presentation will focus on the dynamics of the power electronics market, key drivers, and challenges for both the customers and the semiconductor suppliers. The implications on the compilation of a future-proven semiconductor portfolio mix with three attractive technologies like Si, SiC & GaN, their interaction as well as packaging technology challenges are going to be part of this presentation.

### **13.50-14.05 Wolfspeed**

#### **SiC MOSFETs enables High Power Density and Scalability in MegaWatt (MW) Systems**

*Ian Milne, Power Field Application Engineer*

With the increasing demand for megawatt (MW) power converters for energy storage systems (ESS), solar inverters, electric propulsion, wind converters, Power to X, this presentation goes into the benefits of Wolfspeed's recently introduced 3.3kV all-Silicon Carbide (SiC) power MOSFET modules. In such applications, high power density and scalability is imperative, which the new 100 mm x 140 mm LM package combined with Wolfspeed's fast-switching SiC MOSFET chips can achieve through excellent current-sharing performance, low stray inductance, and ease of paralleling the modules. A brief overview of a case study using two paralleled Wolfspeed 3.3 kV SiC modules is benchmarked against an existing Si IGBT solution to show the clear advantage of improved efficiency, higher current handling at higher switching frequencies and overall higher power densities.

### **14.10-14.30 Schneider Electric**

#### **EcoStruxure Power for Renewables**

*Evelina Ahlen Norberg, Renewable Solutions Consultant, Power Systems*

Schneider Electric delivers new solutions and services to solve the complex grid, power generation, and energy transition challenges. New offerings assist our customers in reaching their decarbonization goals while managing more reliable, efficient, sustainable, and flexible grids. Clean and secure energy can be achieved with a multi-faceted approach based on a foundation of digital transformation.



## Wednesday 06 September

**11.10-11.25 Hioki Europe**

### Accurate reactor evaluation in power electronics made easy

*Roy Hali, Head of Product Management*

High-frequency reactors, in combination with power electronic switching elements such as IGBT, SiC and GaN FETs, are used in a variety of solutions in electric vehicles (EVs) and hybrid electric vehicles (HEVs). Examples include step-up DC/DC converters, AC/DC converters, on-board chargers, etc. In the past, elements such as IGBTs were used as switching elements, and switching frequencies were on the order of tens of kilohertz. In recent years, in the quest of reducing the size of above-mentioned converters and improving the power density of drivetrain, SiC and GaN switching elements are being used more often. As the switching frequencies of SiC and GaN elements are greater than 100 kHz, it is necessary to validate the performance and measure losses of switching elements as well as the reactors. By directly measuring reactor loss, as well as iron loss and copper loss ratios within reactor loss, you can significantly reduce research and development time and identify areas of improvement for reaching even higher efficiency and smaller form factors. In this presentation, Hioki will present a reliable and accurate solution for reactor evaluation.

**11.30-11.45 ModelingTech**

### Grid-tied Inverter HIL Testing Solutions to Meet Grid Code of China

*Xu Lie, Vice President*

Japanese precision since 1935

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**Join our Vendor Session:**  
*"Accurate reactor evaluation in power electronics made easy"*  
**September 6 (Wed), 11:10 – Vendor session area**

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**11.50-12.05 MathWorks**

**12.10-12.25 Plexim GmbH**

**Code generation for multicore microcontrollers with PLECS**

*Lino Capponi*

**12.30-12.45 Hitachi Energy**

**12.50-13.05 Omicron Lab**

**Why a VNA is mandatory for every electronics engineering lab**

*Florian Hämmerle*

In this session we will explain the power of a low-frequency vector network analyzer and why it is a must-have to use one in your engineering lab.

A low-frequency VNA can serve as a frequency response analyzer for transfer function measurements and dynamic system analysis.

It can be used as a powerful impedance analyzer or measure s-parameters of filters and amplifiers.

Use the power of the frequency domain to place poles and zeros in the control loop to stabilize your systems quickly.

Avoid EMI surprises by analyzing your component resonances and filter structures before the compliance measurements.

Simply improve the design process by using a more systematic approach, validated by frequency domain measurements.

**13.10-13.25 EGSTON Power Electronics**

**13.30-13.45 OPAL-RT Technologies**

**Latest innovations in HIL Controller Testing of fast switching and/or complex Power Electronics applications**

*Timo Roesch*

**13.50-14.05 Volkswagen**

**Electrification Strategy of Volkswagen Group with Focus on Power-Inverters**

Volkswagen's transition from an automotive manufacturer to a mobility group leads to big changes and hence a reset of our priorities – one corner stone: the consequent electrification of our powertrains. This shift in focus and competences makes working in the technical development so much more exciting and rewarding. Let us show you, what our goals are, which products we develop and how we contribute to a *mobility for generations to come*

**Push the pulse – Volkswagen at EPE 2023**



## Thursday 07 September

**11.10-11.25      ZES Zimmer Electronic Systems GmbH**

### **Innovative and Precise Power Analysis Solutions to enhance Electromobility Advancement**

*Patrick Fuchs - Business Development Manager*

The future certainly does not question cars, but having sustainable and economic transport. In the context of sustainability, energy conservation, resource preservation, and decarbonization, electromobility consistently remains a driving factor, presenting engineers both today and tomorrow with distinct challenges. This presentation illuminates these challenges and outlines how innovative and dedicated power analysis solutions and functionalities we provide support engineers to fully tap into the optimization potential of their respective products or systems. Measuring the electrical efficiency of the drive train and identifying possibilities to reduce power losses are the pivotal feedback variables, which are indispensable as inputs in the closed-loop of a testing setup to enhance system advancements. In essence, precise efficiency measurement of components and overall systems, identification and breakdown of power losses across the frequency spectrum, characterization and longevity measurements, verification of analytical simulation models, simultaneous capture of fundamental, narrowband, and wideband spectra, post-measurement analysis of raw data, and efficient integration into test bench environments are aspects we intend to introduce. Beyond the power electronics organism of electric vehicles, we also delve into measurements of peripheral systems in E-mobility, such as certification testing of charging stations and more.

**11.50-12.05      Frenetic**

**12.50-13.05      dSPACE**

### **Comprehensive solutions for developing and testing power electronics controls**

*Julian Saele*

**13.10-13.25      InfraTec**

### **Electronic and Semiconductor Testing for Failure Detection with Thermography (active/Lock-in and passive) in HD Resolution**

*Dipl.-Wi-Inform. (FH) Torsten König, Project Manager Thermography Systems*

The thermographic inspection of electronic materials is an established test procedure for quality assurance and process optimisation – from the development of first prototypes to serial production.

InfraTec developed a modular automated test bench for electronic and semiconductor testing – ELIT. Based on Lock-In Thermography this solution is especially designed for the use in R&D as well as for quality tests in production. With different hardware and software functions E-LIT fulfils all requirements in precision and accuracy, which are needed. With its resolution of up to (1,920 x 1,536) IR-pixels it enables the detection of smallest failures on electronic and semiconductor devices.



## Technical Visits

On Friday, the 8<sup>th</sup> of September 2023, several technical visits are planned.

### Technical Visit 1: Grundfos

Grundfos, the world's largest manufacturers of pumps will welcome a limited number of participants to it's headquarter in Bjerringbro. The visit will primary be in the Grundfos visitor center with a tour to the heavily automated UP factory where the largest amount of Grundfos's pumps, with own developed power electronics, is manufactured. The tour will also include a guided walkthrough in the visitor centers exhibition area, which gives a great insight in variety Grundfos products and technologies. Finally, Grundfos will share its Vision and experience in cooperating with universities/companies in relation to power electronics and show how this improves their products.

<https://epe2023.com/technical-visit-1/>

### Technical Visit 2: Østerild

Østerild, The national test center for large Wind turbines

In Wind, it does not get bigger than Østerild, which is the national test center for large Wind turbines. The test center has eight wind turbine sites where both Vestas and Siemens have their newest ~15 MW offshore turbines located. The guided tour starts and ends at the visitor center. The guide enthusiastically tells the story behind the Center and the Danish wind turbine adventure. After the guided tour, a lunch box will be served and visitors may enjoy touching and seeing a 63 m long wind turbine blade or walking up a 14 m (1/10) tower section, which gives a great view of the site.

<https://epe2023.com/technical-visit-2/>

### Technical Visit 3: Vestas

Vestas, the world's largest manufacturers of Wind turbines will welcome a limited number of participants to its Nacelle test center in Aarhus harbor. The visit will already start in the bus from Aalborg where Dr. Philip Carne Kjaer will give an introduction to Vestas and its test facilities. After arrival at the test-center, the visitors will get safety instructions and safety equipment followed up by a two-hour tour in the test facilities. Here the visitors will experience and see a tens of MW nacelle being tested. The test bench is operated with MW power converters, which will be discussed and shown. The Event ends with Lunch and a Q&A session.

**This visit is fully booked**

<https://epe2023.com/technical-visit-3/>

### Technical Visit 4: Advent Technologies

Advent Technologies A/S is an innovation-driven company in the business of fuel cells and renewable energy technology. Our vision is to accelerate electrification and replace fossil fuel combustion with sustainable electrical energy through advanced materials, components and systems. In Aalborg Denmark, Advent develops and manufactures the SereneU high temperature PEM fuel cell unit, the

provides clean energy for back-up, auxiliary, temporary and marine power. The fuel cell systems extends battery runtime and provides power to remote areas and applications, utilizing the energy available in methanol fuels. The visit includes a presentation to the fuel cell technology and products and a tour to see the production facility and watch some of the systems in action. Finally Advent shares some product use cases and provides further insights into some of their current product developments.

<https://epe2023.com/technical-visit-4/>


### Technical Visit 5: Aalborg University – Energy Department


Aalborg University (AAU) was established in 1974 and has since gained a strong reputation for its innovative approach to education by using problem-based learning (PBL). Education and research at AAU are organized in four faculties, which have a total of +20000 students and +3800 employees. AAU Energy hosts laboratories (+5000 m<sup>2</sup>) within all parts of the energy field; our state-of-the-art laboratories range from smart energy systems labs, medium and high voltage equipment, to Power-to-X facility. The AAU Energy laboratories are in the center of many exciting projects where we collaborate with the energy sector to bring new technologies and concepts, from lab-scale to full-scale operation.


**This visit is fully booked**


<https://epe2023.com/technical-visit-5/>


More info on the technical tours on [www.epe2023.com](http://www.epe2023.com) and on [www.epe2023-aalborg.com](http://www.epe2023-aalborg.com).


 AUTOMOTIVE

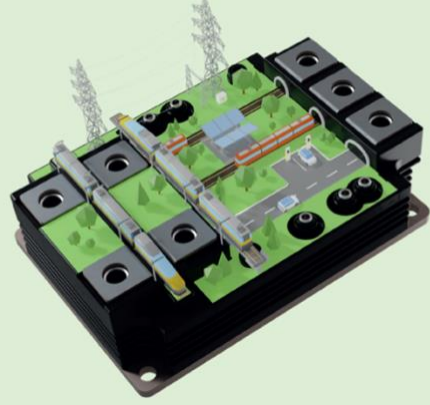
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 POWER TRANSMISSION


 RENEWABLES

 RAILWAY



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## Special Sessions

### Medium-voltage power electronics: a solution to electrify the world

Mini-workshop in the frame of EPE'23 ECCE Europe

**Organizer:** Prof. Stig Munk Nielsen, Aalborg University

**Date & Time:** September 6<sup>th</sup>, 9:30 am – 12:50 am

**Participation:**

This mini-workshop is open to ALL EPE'23 ECCE Europe-delegates who are interested in MV power electronics

<https://epe2023.com/mini-workshop-medium-voltage-power-electronics/>

### Recycling and reuse of electric vehicle batteries and power electronics

**Session Format:** Informal talks (6-7) supported by panel sessions (1-2)

**Date & Time:** Wednesday 6 September: Two parts: 14:10 – 15:10 & 15:40 – 16:40

**Session Organizers:** Prof. Frede Blaabjerg – Aalborg University  
Prof. Chris Mi – San Diego State University  
Prof. Ariya Sangwongwanich – Aalborg University

<https://epe2023.com/recycling-and-reuse-of-electric-vehicle-batteries-and-power-electronics/>

### Reliability and Lifetime prediction of WBG power electronics in automotive applications

Organized by AVL List GmbH, Infineon AG, VUB

**Session Organizers:**

Christoph Abart, AVL List GmbH, Omar Hegazy, Vrije Universiteit Brussel, Klaus Pressel, IFAG

**Session Format:** Keynotes (2), Informal Talks (5)

**Date & Time:** Thursday 7 September, 14:10 – 15:10 & 15:30 – 16:30

<https://epe2023.com/reliability-and-lifetime-prediction-of-wbg-power-electronics-in-automotive-applications/>



## PECTA Sessions



### PECTA's first conference contribution at the EPE 2023 (DK)

Date: **Sept 5<sup>th</sup> – 7<sup>th</sup>, 2023**; PECTA afternoon sessions

With 4 supporting countries and over 40 industry and academic experts the IEA - 4E<sup>1</sup> Power Electronic Conversion Technology Annex - PECTA<sup>2</sup> is moving forward with its ambitious work plan. PECTA aims to support policy-makers by providing evidence and information on Wide band gap (WBG) Technology, to promote the use of WBG in power electronics and thus to contribute to an increased energy efficiency in various sectors; with applications ranging from inverters for photovoltaic and wind plants, to electronic devices, uninterrupted power supplies and industry automation equipment. PECTA's workplan consists of 7 established tasks and the results of these tasks will be presented during 3 EPE conference afternoon sessions on-site at the Aalborg Kongress and Culture Center (AKKC). The experts leading the tasks will discuss their approaches and results related to the wider adoption and use of Wide Bandgap (WBG) technologies driven by SiC and GaN.

This conference is an exciting opportunity for PECTA members and non-members to learn more on how PECTA is going forward and to contribute to its success!

Background information on PECTA's work is given by the published report of phase 1 "[Wide Band Gap Technology: Efficiency Potential and Application Readiness Map](#)", as well as in the [PECTA policy brief](#) which highlights the major outcomes of phase 1 of work. Additionally, you find in the [PECTA Factsheet](#) further information on the currently active 7 tasks to be presented in more detail next September.

<sup>1</sup> The Energy Efficient End-Use Equipment Technology Collaboration Program of the International Energy Agency, IEA-4E:

<https://www.iea-4e.org/>

<sup>2</sup> <https://pecta.iea-4e.org/>

## PECTA 2023 EPE Conference – Agenda 5. – 7.9.2023

PECTA EPE Conference Contribution 2023		
Tue, Sept 5 <sup>th</sup> 2023	Wed, Sept 6 <sup>th</sup> 2023	Th, Sept 7 <sup>th</sup> 2023
<b>1. PECTA-Session</b>	<b>2. PECTA-Session</b>	<b>3. PECTA-Session</b>
PECTA Overview	Looking beyond energy efficiency - Environmental aspects and impacts of WBG devices and applications over their life cycle	Policy measures to drive WBG for end use equipment
Application Readiness Map for WBG-Semiconductors: an Update	Measurement of WBG-based power supplies	Switching losses in power devices: From dynamic on resistance to output capacitance hysteresis
Reliability of WBG, results of a Pre-Scoping Study	Identifying the potential of SiC technology for PV inverters	PECTA Outlook
	Efficiency gain of different applications due to WBG-Technologies	Round Table – Governmental contribution to accelerate WBG adoption

**PECTA Session 1 (Tuesday, 5.9.2023): 15:40 – 17:40)**

**Chair: Markus Makoschitz**

**Topic: PECTA and the WBG Landscape**

- 15:40 Welcome & Get-Together**  
*Markus Makoschitz, Session-Chair*
- 15:50 PECTA: General Overview (35")**  
*Roland Brueniger, PECTA Chair, Swiss Federal Office of Energy (CH)*
- Introduction on the agenda of the 3 PECTA days
  - What is PECTA, and how is it organized (including engagement of experts from Tasks, academia and advisory boards).
  - What has been done during Phase 1 and 2
  - Short review of PECTA goals and time plan
- 16:25 Application Readiness Map for WBG-Semiconductors: an Update (40")**  
*Martin Pfost, TU Dortmund University*  
*Markus Thoben, University of Applied Science and Arts Dortmund*
- 17:05 Reliability for WBG, results of a Pre-Scoping Study (35")**  
*Kaichen Zhang, Aalborg University*  
*Christian Holm Christiansen, Danish Technological Institute*  
*Francesco Iannuzzo, Aalborg University*
- 17:40 End of Day 1**

## PECTA Session 2 (Wednesday, 6.9.2023): 15:40 – 17:40

**Chair: Peter Bennich**

**Topic: Efficiency and ecological impacts of WBG appliances**

- 15:40 Welcome & Get-Together**  
*Peter Bennich, Session-Chair*
- 15:45 Looking beyond energy efficiency – Environmental aspects and impacts of WBG devices and applications over their life cycle (35")**  
*Sebastian Glaser, Vienna University of Technology – Research Group Ecodesign*  
*Philipp Feuchter, Vienna University of Technology – Research Group Ecodesign*  
*Adriana Diaz, ECODESIGN company engineering & management consultancy GmbH*
- 16:20 Measurements of WBG-based power supplies (30")**  
*Hongkeng Zhu, Ecole Polytechnique Federale de Lausanne*  
*Markus Makoschitz, AIT Austrian Institute of Technology GmbH*  
*Elison Mاتيoli, Ecole Polytechnique Federale de Lausanne*  
*Katharina Machtinger, AIT Austrian Institute of Technology GmbH*
- 16:50 Identifying the potential of SiC technology for PV inverters (20")**  
*Troy Eskilson, AIT Austrian Institute of Technology GmbH*  
*Andreas Jehle, ZHAW School of Engineering*  
*Peter Schmidt, ZHAW School of Engineering*  
*Markus Makoschitz, AIT Austrian Institute of Technology GmbH*  
*Franz Baumgartner, ZHAW School of Engineering*
- 17:10 Efficiency gain of different applications due to WBG-Technologies (30")**  
*Renato Minamisawa, Fachhochschule Nordwestschweiz*  
*Nicola Schulz, Fachhochschule Nordwestschweiz*  
*Lucas Spejo, Fachhochschule Nordwestschweiz*  
*Erik Nonis, Fachhochschule Nordwestschweiz*
- 17:40 End of Day 2**



## PECTA Session 3 (Thursday, 7.9.2023): 15:00 – 17:00

**Chair: Christian Holm Christiansen**

**Topic: PECTA: policy issues, standards and outlook**

- 15:00 Welcome & Get-Together**  
*Christian Holm Christiansen, Session-Chair*
- 15:05 Policy measures to drive WBG for end use equipment (40")**  
*Bjarke Spliid Hansen, Tek-Info v/ Bjarke Hansen*
- 15:45 Switching losses in power devices: From dynamic on resistance to output capacitance hysteresis (40")**  
*Elison Matioli, Ecole Polytechnique Federale de Lausanne*  
*Hongkeng Zhu, Ecole Polytechnique Federale de Lausanne*
- 16:25 PECTA Outlook of next term**  
*Roland Brueniger, PECTA Chair (CH) (10")*
- **Next steps and strategic agenda**
  - **PECTA's 2<sup>nd</sup> term 2024 – 2029**
- 16:35 Round Table – Governmental contribution to accelerate WBG adoption (25")**  
*Moderator: Roland Brueniger, PECTA Chair, Swiss Federal Office of Energy (CH)*
- Panel Members:**
- **P. Bennich (SWE, PECTA MC)**
  - **A. Diaz (AT, PECTA Vice Chair)**
  - **L. Lorenz (ECPE)**
  - **B. Hansen (DK, Consultant)**
  - **F. Iannuzzo (DK, Prof. at Aalborg University)**
  - **C. Christiansen (DK, Teknologisk)**
- 17:00 End of Day 3**



## Sponsorship and Exhibition

Sponsorship & Exhibition contact: [Nancy.Langsborg@vub.be](mailto:Nancy.Langsborg@vub.be)

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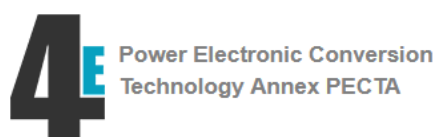
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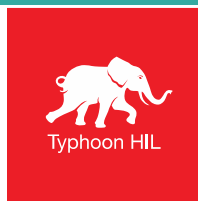
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## Join the Typhoon HIL Workshop or meet us at EPE'23 ECCE Europe

### Join the Typhoon HIL Workshop

Location	Aalborg University
Time	September 11th, 2023 from 9:00 AM
About	Join one of the Typhoon HIL hands-on workshops at Aalborg University designed to equip PhD students and young engineers with the skills for performing Hardware-in-the-Loop (HIL) projects. The workshops will cover an introduction to Typhoon HIL and HIL technology, an overview of the Typhoon HIL Control Center Toolchain and supporting resources, and a hands-on introduction to the basic workflow followed by a dedicated hands-on session covering power electronics modeling and real-time simulation, modeling and simulation for microgrids, as well as test automation.
	<a href="#">Learn more and register here</a>

### Visit our Vendor Session

Location	Vendor session area in Fundamentet
Time	September 5th, 2023 from 12:50 PM
About	Visit our vendor session to learn more about our real-time simulation solutions for HIL testing in power electronics, power systems and e-mobility.

### Learn more at our booth

Location	Ground Floor, Booth 10
Time	September 4th to 8th, 2023
About	Meet our team at our conference booth for a personalized live demo of our HIL testing solutions. Next to us, you will be able to learn more about Danfoss Drives and their MyDrive® HIL for iC7 Frequency Converters that is powered with our HIL real-time simulation devices.



Organized in partnership with:

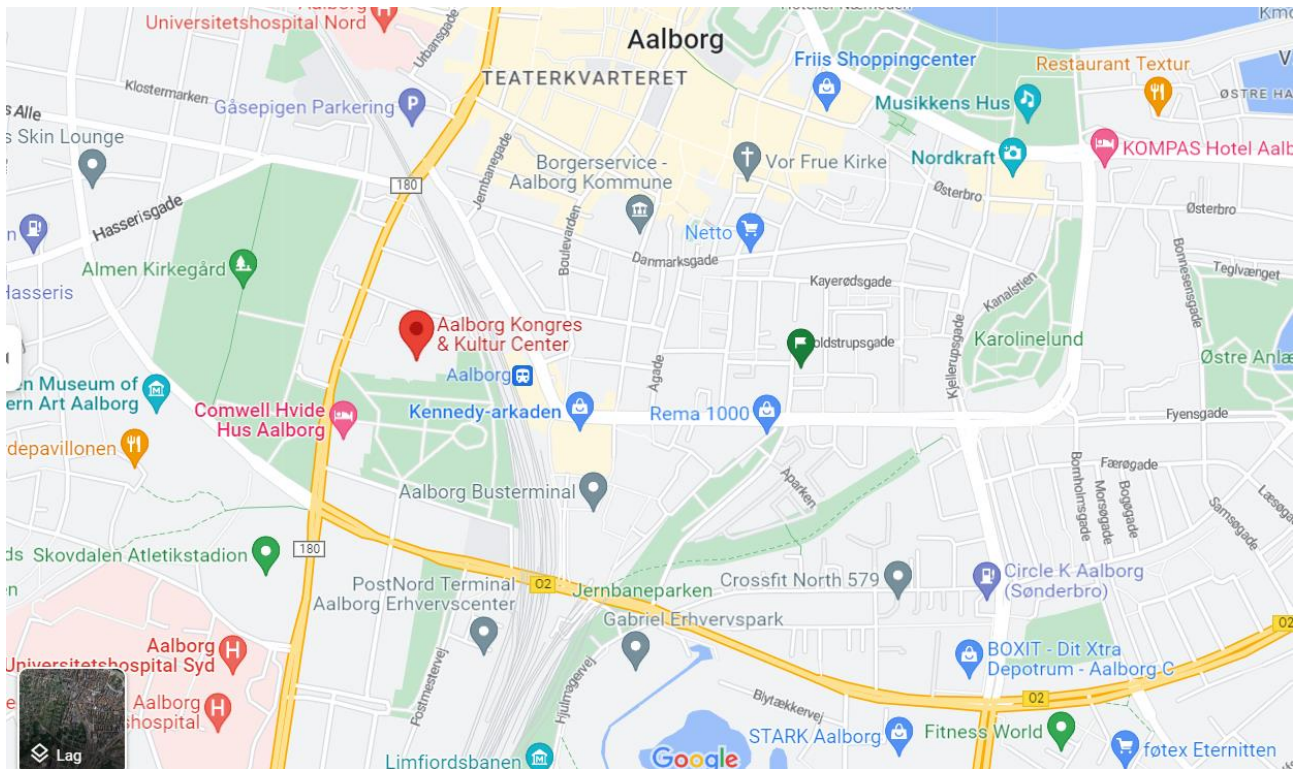


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## EPE'23 ECCE Europe: How to get to Aalborg?

Aalborg is located in northwestern Denmark, in North Jutland to be precise, at the banks of the Limfjord. Aalborg can be reached by plane, train, bus and car.



The Aalborg Kongres & Kultur Center (AKKC) is located in the city center, very near to the Railway and Bus Station. (Aalborg Kongres & Kultur Center, Europa Plads 4, DK-9000 Aalborg, DK). There are plenty of hotels around in all price classes.

### How to get to Aalborg?

#### **By Plane:**

Aalborg Airport is located 6,5 km northwest of the city. There are direct flights from/to New York (seasonal), Copenhagen, Amsterdam, London, Oslo, and more!

To get from Aalborg airport to the city center (i.e. the AKKC), you can:

- 1) Take a taxi. It should cost approximately around 300 DKK / 40 EUR and take about 12 mins.
- 2) Take bus no. 70 or no. 200 to Prinsensgade (Aalborg), then walk 600 meters to AKKC.
- 3) Take bus no. 12 to Budolfi Plads, then walk 800 meters to AKKC.

#### **By Train:**

Aalborg Railway Station is located in the City Center of Aalborg. It serves as a connecting hub between North Jutland and the rest of Denmark. It offers many daily connections to and from Copenhagen. (Attention: the train trip is between 4 to 5 hours. The price is approximately 482 DKK / 63,77 EUR. Train tickets should be bought at the train station, or booked online via <https://www.dsb.dk/>).

**By Bus:**

Aalborg Bus Station is also located in the City Center of Aalborg, at the John F. Kennedy Plads. It is a busstation served by among others Flixbus. There are several daily Flixbus connections to and from for example Copenhagen Kastrup Airport. Such a trip takes 5:30 to 6:30 hours and costs approximately 180 DKK/ 24,00 EUR to 300 DKK / 40,00 EUR.

**By Car:**

The European Route E45, coming from the German-Danish border, passes through Aalborg.

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## Hotels

You can find all information on hotels on our website: <https://epe2023.com/hotels/>

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