

EPE'21

September 6-10, 2021 | 100% virtual

The 23<sup>rd</sup> European Conference on Power Electronics and Applications

ECCE Europe

<http://www.epe2021.com>



# NEWSLETTER

## EPE'21 ECCE EUROPE



# Contents

- *EPE'21 ECCE Europe*
  - *Registration*
  - *Technical programme*
  - *Keynotes*
  - *Tutorials*
  - *Industrial Forum*
  - *IEEE PELS TC12 – EBL II*
  - *Exhibition*



# EPE'21 ECCE Europe

## Registration

*Don't wait too long to register, do it today*

*From 27 August on, the registration fee will increase*

### Registration

Make sure to [renew your EPE membership](#) on time to be able to register at the reduced registration fee.

Do not forget to register for the tutorial of your choice!

## Technical programme (time schedule is in CET)

Tuesday 7 September - Morning			
09:00	Opening Session	Plenary	Channel 1
09:30	<b>Keynote 1 - Functional needs and potential technologies, to enable the stepwise development of HVDC multi-terminal grids</b> Dr. Florent MOREL, SuperGrid Institute, France	Plenary	Channel 1
10:10	LS1a - Topic 2: Modular Multilevel Converters	Lecture	Channel 1
	LS1b - Topic 1: Wide Bandgap	Lecture	Channel 2
	LS1c - Topic 5: Machine and Actuators	Lecture	Channel 3
	LS1d - Topic 4: Advanced PWM and Control Methods	Lecture	Channel 4
Tuesday 7 September - Afternoon			
13:30	<b>Keynote 2 - Multi-Scale Control and Modeling of Power-Electronic Systems and Networks</b> Prof. Dr. Sudip MAZUMDER – University of Illinois at Chicago, USA	Plenary	Channel 1
14:10	LS2a - Topic 2: Grid Connected Converters	Lecture	Channel 1
	LS2b - Topic 1: System Integration	Lecture	Channel 2
	LS2c - Topic 5: Design and Control of Electric Drives	Lecture	Channel 3
	LS2d - Topic 4: Advanced Measurements and Estimations Methods	Lecture	Channel 4
16:30	Award Session	Plenary	Channel 1



**Wednesday 8 September - Morning**

09:00	<b>Keynote 3 - The Future of E-Mobility</b> Prof. Dr. Joeri VAN MIERLO - Vrije Universiteit Brussel, Belgium	Plenary	Channel 1
09:30	<b>Keynote 4 - HITACHI's Vision for a Carbon-Neutral Future</b> Dr. Norihiro SUZUKI - Hitachi Ltd, Japan	Plenary	Channel 1
10:10	LS3a - Topic 8: E-Mobility	Lecture	Channel 1
	LS3b - Topic 2: Resonant Converters	Lecture	Channel 2
	LS3c - Topic 3: Converter Design and Optimisation	Lecture	Channel 3
	LS3d - Topic 7: Power Electronics in Transmission and Distribution Systems	Lecture	Channel 4

**Wednesday 8 September - Afternoon**

13:30	<b>Keynote 5 - Hybrid Electric Solutions for Marine Applications</b> Dr. Sami KANERVA - ABB Oy, Finland	Plenary	Channel 1
14:10	LS4b - Topic 2: Wide Band Gap Power Converters	Lecture	Channel 2
	LS4c - Topic 3: Converter Modelling and Low-level Control, including Gate-Drives	Lecture	Channel 3
	LS4d - Topic 7: Microgrids and HIL Simulators	Lecture	Channel 4
16:10	PELS TC12: Empower a Billion Lives - Phase II	Industrial Forum	PELS TC12 - EBL II - Zoom Channel

**Thursday 9 September - Morning**

09:00	Closing Session	Plenary	Channel 1
09:30	<b>Keynote 6 - Reliability of Modern Power Electronic based Power Systems</b> Prof. Dr. Frede BLAABJERG - Aalborg University, Denmark	Plenary	Channel 1
10:10	LS5a - Topic 1: Reliability	Lecture	Channel 1
	LS5b - Topic 6: Power Electronics in Renewables	Lecture	Channel 2
	LS5d - Topic 9: Power Supplies and Industry-Specific Applications	Lecture	Channel 4

**Thursday 9 September - Afternoon**

13:30	<b>Keynote 7 - Power Electronics – A Key Enabling Technology to realize the Green Deal</b> Prof. Dr. Rik DE DONCKER - RWTH Aachen, Germany	Plenary	Channel 1
14:10	LS6a - Topic 1: Passives	Lecture	Channel 1
	LS6b - Topic 10: Data Analysis, Artificial Intelligence and Communication	Lecture	Channel 2
	LS6c - Topic 3: EMI/EMC in Power Electronics including HF Phenomena	Lecture	Channel 3
	LS6d - Topic 7: HVDC and MVDC systems	Lecture	Channel 4
16:10	<b>Keynote 8 - Power electronics, a key technology for the renewable energy system integration</b> Ms. Hélène CHRAYE – European Commission, Brussels, Belgium	Plenary	Channel 1

**Friday 10 September – Morning  
Industrial Forum**

09:00 - 10:30	<b>Session I</b> <b>Power Electronics Reliability and Condition Monitoring</b>	Channel 1
11:00 - 12:30	<b>Session II</b> <b>Power Electronics in Energy Transition</b>	Channel 2
<b>Friday 10 September – Afternoon Industrial Forum</b>		
14:00 - 15:30	<b>Session III</b> <b>Challenges of Power Electronics Control Design for Electric Vehicles</b>	Channel 1
16:00 - 17:30	<b>Session IV</b> <b>Green Railway Traction Systems</b>	Channel 2

**Dialogue Sessions**

DS - Topic 1: Devices, Components, Packaging and System Integration	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 2: Power Converters Topologies	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 3: Converter Modelling, Design and Low-Level Control	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 4: Measurement, Supervision and Control for Power Converters	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 5: Electrical Machines and Drive Systems	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 6: Renewable Energy Power Systems	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 7: Grids, Smart Grids, AC & DC	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 8: E-Mobility	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 9: Power Supplies and Industry-Specific Applications	Dialogue	Whova - Continuous Dialogue Session
DS - Topic 10: Data Analysis, Artificial Intelligence and Communication	Dialogue	Whova - Continuous Dialogue Session

The dynamic technical programme is online. Check it out at:

**Technical programme**

● **Keynotes***Tuesday 7 September 2021***09:30-10:00****Functional needs and potential technologies, to enable the stepwise development of HVDC multi-terminal grids****Dr. Florent MOREL**SuperGrid Institute  
Research Group Leader**13:30-14:00****Multi-Scale Control and Modeling of Power-Electronic Systems and Networks****Prof. Dr. Sudip MAZUMDER**University of Illinois at Chicago  
Professor and Director of the Laboratory for Energy and Switching-Electronic Systems  
President of NextWatt LLC*Wednesday 8 September 2021***09:00-09:30****The future of e-mobility****Prof. Dr. Ir. Joeri VAN MIERLO**Director of MOBI – Mobility, Logistics and Automotive technology research centre  
Head of ETEC – Department of Electrical Engineering and Energy Technology  
Vrije Universiteit Brussel, Belgium**09:30-10:00****HITACHI's vision for a carbon-neutral future****Dr. Norihiro SUZUKI**Vice President & Executive Officer  
Chief Technology Officer  
Hitachi, Ltd.**13:30-14:00****Hybrid Electric Solutions for Marine Applications****Dr. Sami KANERVA**Global Product Manager, Fuel Cells  
ABB Oy, Marine & Ports



Thursday 9 September 2021

09:30-10:00



### Reliability of Modern Power Electronic based Power Systems

**Prof. Dr. Ir. Frede BLAABJERG**

Department of Energy Technology  
Aalborg University, Denmark

13:30-14:00



### Power Electronics – A Key Enabling Technology to realize the Green deal

**Prof. Dr. Ir. Rik DE DONCKER**

RWTH Aachen University  
E.ON Energy Research Center & Research Campus Flexible Networks  
Aachen, Germany

16:10-16:40



### Power Electronics, a Key Technology for the Renewable Energy System Integration

**Hélène CHRAYE**

European Commission, DG R&I  
Head of Unit Clean Energy Transition

## Keynotes

## ● *Tutorials*

### **TUTORIAL N° 2**

**Morning (09:30 – 13:00)**

#### Reliability of Modern Power Electronics Based Power System (PEPS)

- Frede BLAABJERG (Department of Energy Technology, Aalborg University, Denmark)
- Dao ZHOU (Department of Energy Technology, Aalborg University, Denmark)
- Saeed PEYGHAMI (Department of Energy Technology, Aalborg University, Denmark)
- Jose RUEDA TORRES (Electrical Sustainable Energy Department, Delft University of Technology, the Netherlands)

### **TUTORIAL N° 3**

**Full Day (09:30 – 13:00 + 14:00 – 17:30)**

#### Safety considerations in Low Voltage DC Grids

- Johan DRIESEN (KU Leuven/EnergyVille)
- Simon RAVYTS (KU Leuven/EnergyVille)
- Giel VAN DEN BROECK (DCINERGY)

**TUTORIAL N° 4****Full Day (09:30 – 13:00 + 14:00 – 17:30)****Control of Modular Multilevel Converters for Variable-Voltage Variable-Frequency Applications**

- Axel MERTENS (Institute for Drive Systems and Power Electronics, Leibniz University Hannover)
- Jakub KUCKA (Power Electronics Laboratory, EPFL)
- Dennis KARWATZKI (Siemens AG, Large Drive Applications)

**TUTORIAL N° 5****Morning (09:30 – 13:00)****Integrated Drives: power electronics and electrical machine challenges**

- Betty LEMAIRE-SEMAIL (Université de Lille)
- Nadir IDIR (Université de Lille)
- Eric SEMAIL (Université de Lille)
- Ke LI (Coventry University)
- Souad HARMAND (Université Polytechnique des Hauts de France)
- Florent NIERLICH (CTO Safran Electrical & Power)

**TUTORIAL N° 7****Full Day (09:30 – 13:00 + 14:00 – 17:30)****Getting to know LLC resonant converters: a guided tour through modeling, design, control and practical issues**

- Claudio ADRAGNA (STMicroelectronics)
- Francesco GENNARO (STMicroelectronics)

**TUTORIAL N° 8****Afternoon (14:00 – 17:30)****Grid forming converters connected to the transmission system**

- Xavier GUILLAUD (L2EP Centrale Lille)
- Frédéric COLAS (L2EP ENSAM)
- Taoufik QORIA (L2EP Centrale Lille)

**TUTORIAL N° 9****Full Day (09:30 – 13:00 + 14:00 – 17:30)****Model Predictive Control of Power Electronic Systems: Methods, Results, and Challenges**

- Tobias GEYER (ABB System Drives, Switzerland)
- Petros KARAMANAKOS (Faculty of Information Technology and Communication Sciences, Tampere University, Finland)

**TUTORIAL N° 10****Afternoon (14:00 – 17:30)****Reliability and Lifetime of PV-Battery Systems**

- Huai WANG (Aalborg University)
- Daniel-Ioan STROE (Aalborg University)
- Ariya SANGWONGWANICH (Aalborg University)

**TUTORIAL N° 12****Morning (09:30 – 13:00)****Testing and Modelling of Power Electronic Components for Reliability**

- Francesco IANNUZZO (Corpe – Aalborg University)
- Amir Sajjad BAHMAN (Corpe – Aalborg University)





Modular Multi-Level Converter enabling Reliability-Oriented Control and Fault Protection in MVdc Grids

- Marco Liserre (Christian-Albrechts-Universität zu Kiel)
- Rongwu Zhu (Harbin Institute of Technology)
- Marius Langwasser (Christian-Albrechts-Universität zu Kiel)

Tutorials content● **Industrial Forum***Friday 10 September 2021 (09:00 - 12:30 + 14:00 - 17:30)*

The EPE ECCE Europe conference brings together researchers, engineers, etc. working at the forefront of power electronics technologies. With the objective to exchange and meet fellow professionals and academics and on top of the tutorials, lecture and dialogue sessions, the organizing committees will propose **several discussion sessions within the industrial forums**.

The sessions will be open to all EPE 2021 Conference participants.

**Industrial Forum Chairman**

*Dr. Piotr DWORAKOWSKI  
SuperGrid Institute  
Research Group Leader*

The industrial forum will be a whole day program with presentations (15 min each) and panel discussions.

**Session I:****Power Electronics Reliability and Condition Monitoring****09:00 - 10:30**

*Session chairman: Prof. Huai WANG, Aalborg University,  
Denmark*

*Channel 1*

Towards Anti-fragility in Power Electronics

Dr. Julio BRANDELERO, Senior Researcher, Mitsubishi Electric Research Center Europe, France

Understanding and Exploiting the Value of Condition Monitoring in Power Converters

Dr. Jorge GONCALVES, Product Manager, Amantys Power Electronics, UK

Reliability of SiC MOSFET in high power applications

Dr. Besar ASLLANI, R&amp;D engineer, SuperGrid Institute, France

Power Electronics Reliability in Railway Traction: Towards system resilience

Michel PITON, R&amp;D Program Manager – Master Expert Power Electronics, Alstom, France

**Session II:****Power Electronics in Energy Transition****Session chairman: Dr. Piotr DWORAKOWSKI, SuperGrid****Institute, France****Channel 2****11:00 - 12:30**

Innovation in power electronics: a new age powered by interlinked applications including renewables, energy storage, charging infrastructure and more...

Dr. Milan ROSINA, Yole Développement, France

Power supplies development for ITER nuclear fusion power plant

Hong SHEN, Power Conversion Engineer and Dr. Thomas LAGIER, Power Electronics Engineer, ITER, France

Medium frequency transformer for MVDC converters – challenges in insulation and power loss measurement

Martin GUILLET, Research group leader, SuperGrid Institute, France

Solid State Transformers: Challenges and Applications

Dr. Ilknur COLAK, Head of Power Electronics R&amp;D, Maschinenfabrik Reinhausen, Germany

**Session III:****Challenges of Power Electronics Control Design for Electric Vehicles****Session chairmen: Pablo ROMERO CUMBRERAS and****Tony LENNON, MathWorks****Channel 1****14:00 - 15:30**

Testing BMS on Hardware-in-the-Loop, with a focus on battery states' estimations robustness

Dr. Marc LUCEA, R&amp;D BMS Manager, Leclanché

Controlling current from the inverter to the motor for quick, smooth acceleration and maximum torque per amp

Keloth PRADEEP KUMAR, Technical leader Hybrid Power Train, Bosch

DC/DC 48V

Dr. Daniel PATRASCU, Senior System Engineer for Hybrid Electric Vehicles, Vitesco

Interlock Times in High-Voltage IGBT Inverters

Dr. Sabin CARPIUC, Senior Physical Modeling Engineer, MathWorks

Accelerating EV powertrain development with Model-Based Design

Dr. Carlos VILLEGAS, Electrification Industry Manager, Speedgoat

Electric vehicle charging according to standard IEC62196 – mode 3

Juliano GRIGULO, Application Engineer, Typhoon HIL

**Session IV:****Green Railway Traction Systems****Session chairman: Koen DE GUSSEME, Infrabel, Belgium****Channel 2****16:00 - 17:30**

Traction technology for Battery & Hydrogen Trains – a contribution to green Mobility

Jochen STEINBAUER, Platform Director Hydrogen technologies and trains, Siemens Mobility, Germany

Design of Fuel Cell powered Traction Chains for Railway Application

Thomas HUGGENBERGER, ABB, Switzerland



## ● IEEE PELS TC12 – EBL II



EPE '21 ECCE Special Session on Energy Access and Empower a Billion Lives Global Competition

**This special session is dedicated to Braham Ferreira – Founder of Empower a Billion Lives**

This special session is centred around the IEEE Power Electronics Society (PELS) activities in the field of Energy Access and the technology gaps and opportunities in the field of Energy Access. A new PELS initiative, Global Energy Access Forum (GEAF), has been formed to bring together a diverse group of energy access stakeholders, including governments, industry, academia, financial institutions, NGOs and end-users, to create alignment in goals, metrics, strategy and approach to achieve the objective of universal access to abundant and sustainable energy for all by 2030. GEAF will enable partnering with other IEEE societies and initiatives, NGOs, government organizations, universities, and private industry. This Global Energy Access Forum is the home of IEEE Empower a Billion Lives (EBL), a recurring global competition to help create an ecosystem of technologists and entrepreneurs who develop, demonstrate, derisk and deploy new energy access solutions that are holistic, economically viable and can scale rapidly in the target market segments.

The session will further put a spotlight on IEEE Empower a Billion Lives as an IEEE PELS flagship initiative that started in 2018, will run the second round in 2021-2022 and will continue in the years to come. Including the comprehensive review of the criteria for establishing an EBL team and competition in this global competition.

### Agenda EPE '21 ECCE

IEEE Power Electronics Society Introduction of the Global Energy Access Forum, Energy Access and Off-Grid Technical Committee and an in-depth presentation of the scope and requirements for the Empower a Billion Lives (EBL) Global Competition to Crowdfund Energy Access Solutions.

4:10 pm to 5:30 pm CET.

#### Presenters:

Introduction: Sanjib Kumar Panda – Introduction to the Presentation and Technical Committee

Panel Moderator: Deepak Divan – Introduction to the Global Energy Access Forum and EBL competition rules and overview.

Panelists: Jelena Popovic, Issa Batarseh, Sanjib Kumar Panda

Q&A

Registration

## ● Exhibition & Sponsorship Opportunities

### Exhibition

#### Virtual booth fee:

- Stand price: 799 € VAT exc. + Exhibitor's registration (full rate)  
*Full rate conference or author registration:*  
 830 € VAT inc. after 26 August.
  - No exceptions: Company's authors already registered are not valid.

**Stand will only be valid if there is a registered representative of the company.**

- Additional orders:
  - + 499 € VAT exc. for information on EPE Association Website  
( [www.epe-association.org](http://www.epe-association.org) )
  - + 299 € VAT exc. for a vendor session (20 minutes)
  -

Tariffs & registration

Whova tutorial

### Sponsorship opportunities

*Companies or organisations are welcome to sponsor the conference.  
A custom-made visibility package can be set up on request by email.*

Contact person: Nancy Langsberg – [nancy.langsberg@vub.be](mailto:nancy.langsberg@vub.be)

### Our exhibitors:



Ferraz Shawmut | Eldre | Idealec | FTCAP



Typhoon HIL

