



## The European Power Electronics Network ■

- Joint Research
- Advanced Training
- Public Relations



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# ECPE Annual Event ■

## CIPS - International Conference on Integrated Power Electronics Systems



■ The International Conference on Integrated Power Electronics Systems (CIPS) is organized biennially by VDE and ECPE in the frame of the ECPE Annual Event. Since the first CIPS in 1999, this conference has been focused on the integration of hybrid and mechatronic systems with high power density and systems' or components' operational behavior and reliability.

» ECPE the Industry-driven Research Network for Power Electronics; the leading European Technology and Innovation Platform; a strong voice of the Power Electronics community in Europe to the public and to politics! «

## ECPE SiC & GaN User Forum 'Potential of Wide Bandgap Semiconductors in Power Electronic Applications'



■ The SiC & GaN User Forum is a Flagship of the ECPE Workshops. Since more than 12 years, the potential of wide-bandgap power semiconductors for different applications discussed in the forum that takes place every two years. Renowned Experts from industry and academia show the current state of the art and future trends as well as current research and development work. With more than 300 participants in 2019 it has become a valuable platform established for the exchange of experience.

# Networking Platform ■

## ECPE Joint Stand at PCIM Europe Exhibition

■ ECPE is organizing a Joint Stand with Network Members at PCIM Europe Exhibition since 2005. In the last years this 160 m<sup>2</sup> stand has developed to a popular meeting point of our Network members at PCIM exhibition. Major highlights are the get-together of Network members and the ECPE Students Day.

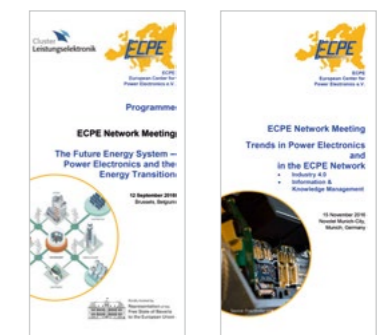


## ECPE Network Meetings

■ The ECPE Network Meetings offer a networking platform for exchange and discussion of trends and strategic topics in the ECPE power electronics community of Member companies and Competence Centres. Recently addressed trends in Power Electronics and in the ECPE Network:



- power electronics and smart industrial manufacturing (Industry 4.0) including smart inverter, big data, condition monitoring and system integration with sensors and actuators
- information and knowledge management in the ECPE Network including eLearning in power electronics
- the role of power electronics in the upcoming energy transition towards an electricity grid dominated by power electronics on the generation side as well as on the load side
- digitalization driven by the fusion of power electronics and information & communication technologies including the problem of cybersecurity of energy systems



# ECPE Network ■

■ ECPE European Center for Power Electronics e.V., founded in 2003 is the leading industry-driven Research Network in the field of Power Electronics in Europe with about 200 member organisations, comprising Member companies and Competence Centres.

As a European technology and innovation platform, ECPE is driving precompetitive joint research and set up research & technology roadmaps for a strategic research agenda with future research directions according to the demands of European power electronics industry. The ECPE expert workshops and advanced training programme covers a wide range of current topics and addresses especially engineers from industry.

**Precompetitive Joint Research**

Network-internal research is organized in the ECPE Joint Research Programme focussing mainly on power electronics in automotive and industrial systems as well as for renewable energies and smart grids.

**Advanced Training**

ECPE Workshops and Tutorials are addressing a wide range of up-to date topics targeting especially at engineers in industry. In addition, a power electronics online course is available on the ECPE web site for members

**Public Relations**

The ECPE public relations and lobbying activities to increase awareness of the role and importance of power electronics for Europe have two main directions, publicly funded research programmes addressing power electronics topics and future young engineers.

## Join ECPE ■

Do you want to become part of the leading Industry-driven Research Network for Power Electronics in Europe?

For more information about membership please contact **Sabrina Haberl** (Member Service) or **Thomas Harder** (General Manager). See contact details on **page 11**.

## Network Services



# ECPE Workshops ■

■ The ECPE Workshops are addressing a wide range of up-to-date topics along the innovation and value chain of power electronics from materials, components and integration technologies up to system-related topics in various application fields of power electronics

e.g. in automotive, industrial drives, renewable energies and electronic power grids. These two-day Workshops provide a unique platform for networking talks and expert discussion.

### Range of recent topics:

- New Technologies for Medium-Frequency Solid-State Transformers
- Humidity in Power Electronics – Degradation Mechanisms and Lifetime Modelling
- Availability of Power Electronics by Fault-Tolerant Designs in Automotive and Aircraft
- Advanced Packaging – Power Modules 2.0
- Power Semiconductors for Medium-Voltage Applications
- Magnetic Components in Power Electronics.



Free of charge for ECPE Member companies (3 seats) ■

## ECPE Tutorials ■

■ While the Workshops are mainly focussing on expert discussion, the ECPE Tutorials are addressing education and advanced training with the target group of engineers in industry entering a new job or function. The number of participants of these two-day courses is

normally limited to 35 persons to keep the classroom atmosphere. The portfolio of ECPE Tutorials is covering the basic topics and disciplines of power electronics: power semiconductor technologies and devices, power electronics packaging, EMC, reliability and thermal engineering.

Furthermore, ECPE is offering practical lab courses in cooperation with Competence Centres e.g. on 'EMC Optimized Design' with Fraunhofer IZM in Berlin.

Reduced fee for ECPE Member companies and Competence Centres ■

All programmes and registration forms are available on: [www.ecpe.org/events](http://www.ecpe.org/events)

# ECPE Member Companies



# ECPE Competence Centres



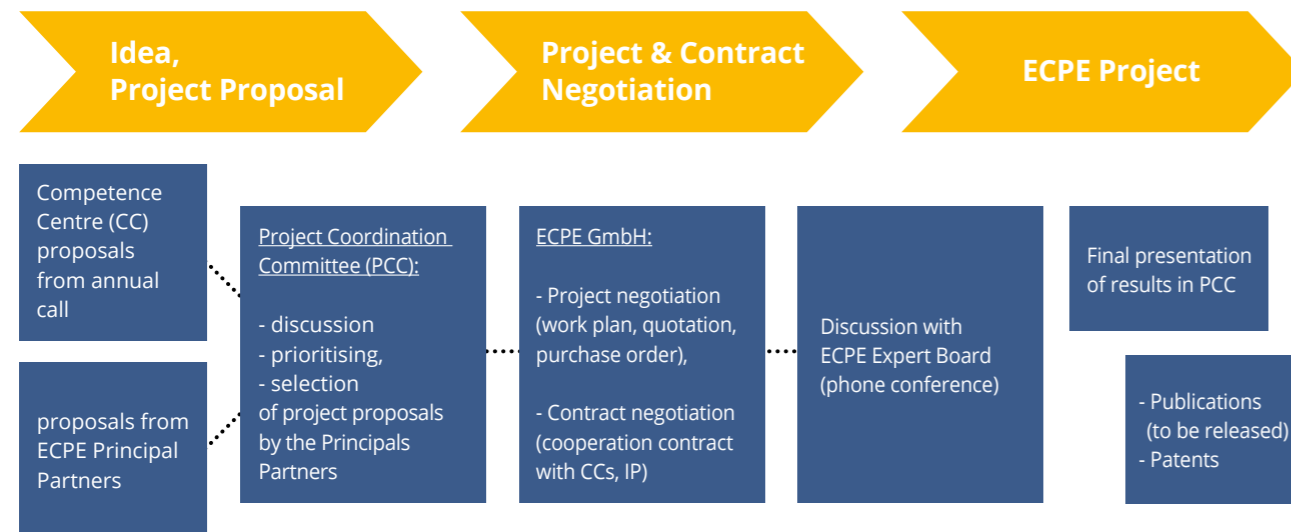
# ECPE Joint Research Programme

In the network-internal research programme ECPE member companies jointly agree on pre-competitive research topics which are contracted to ECPE Competence Centres. The budget comes from an industrial research fund fed by the ECPE companies who took the option to join the research programme as Principal resp. Associate Partner. The Competence Centres are invited to submit research topics in an annual Call-for-Proposals.

**Main benefit for the companies:** cost sharing and discussion of latest research topics with university and research institutes as well as with companies along the value chain of power electronics

**Main benefit for the institutes:** funding opportunities and close cooperation with European power electronics industry

## Procedure: from the project idea to the final report/demonstrator

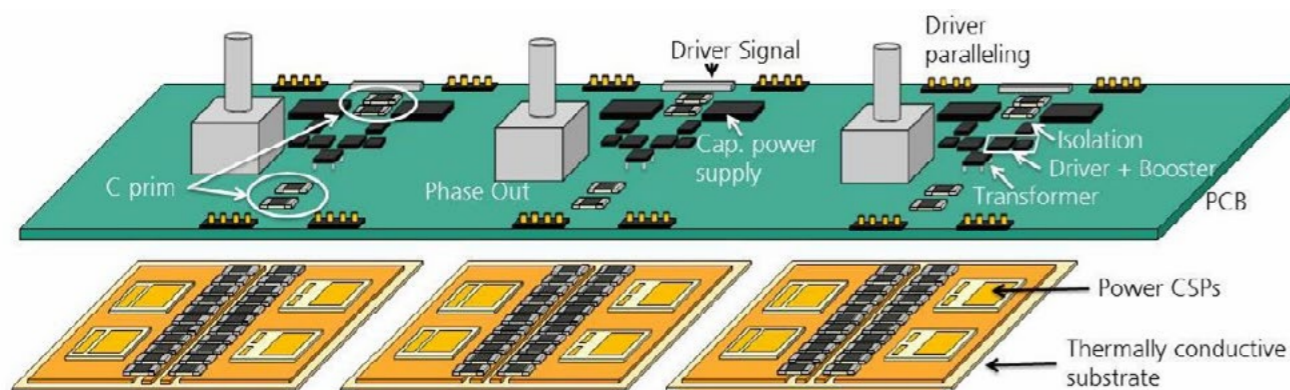


### Example:

ECPE Lighthouse Programme msPEBB  
- modular and scalable Power Electronic Building Block

### SiC module:

Pre-packages (PowerCSPs) using PCB embedding technology

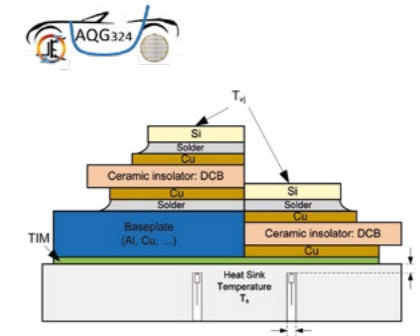


# ECPE Working Groups

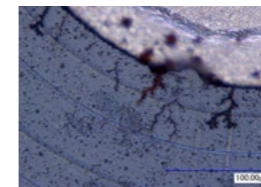
## ECPE AQG 324 'Automotive Qualification Guideline'

The ECPE Working Group AQG 324 established in June 2017 is working on a European Qualification Guideline for Power Modules for Use in Power Electronics Converter Units in Motor Vehicles. Based on the former German LV 324 supply agreement, the ECPE Guideline defines a common procedure for characterizing module testing as well as for environmental and lifetime testing of power electronic modules for automotive application. The guideline

has been released by the responsible Industrial Working Group comprising more than 30 ECPE member companies from the automotive supply chain. The present AQG 324 Release 02/2019 focuses on Si-based power modules while the ECPE Working Group is presently discussing the integration of wide bandgap power semiconductors SiC and GaN as well as novel assembly and interconnection technologies including power embedding.



## Power Semiconductor Reliability for Railway Application



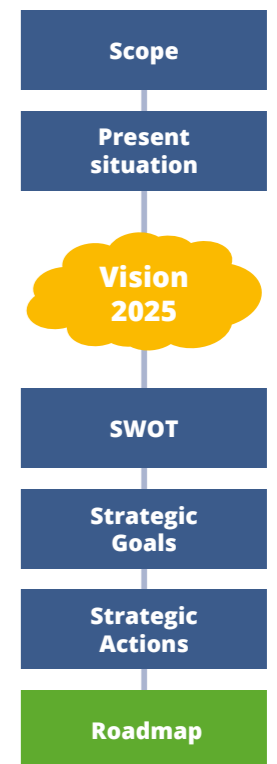
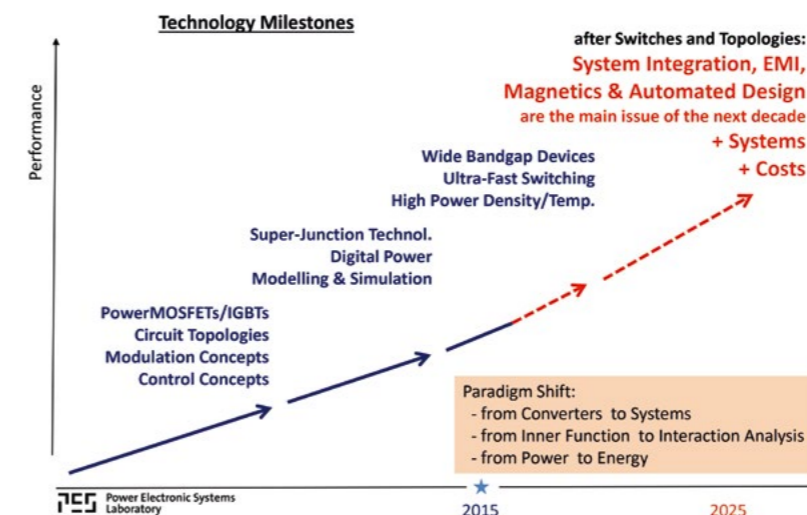
The ECPE Working Group on 'Power Semiconductor Reliability for Railway Application' has been established in November 2017 in cooperation with the PINTA Project in the European Shift2Rail Joint Undertaking.

The focus of the working group is on environmental conditions for power semiconductors used in railway application especially under humidity load incl. moisture condensation and chemical attack.

# ECPE Roadmap Programme

Research and Technology Roadmaps are an important strategic tool to identify and guide a mainstream for medium to long term research. The ECPE Roadmaps 'Power Electronics 2025' and 'Lead Applications for SiC and GaN' provide input and industrial

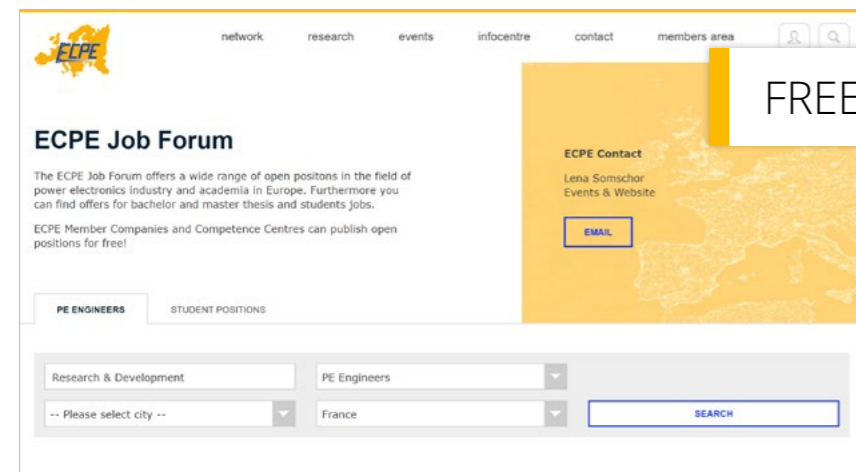
guidance to research programmes on European and on national level. Furthermore, ECPE Members can reflect their own company roadmap vs. the ECPE roadmaps and the Competence Centres use the roadmaps when they define new research directions.



# ECPE Programme 'Young Engineers Needed'

## European PhD School

The European PhD School on 'Power Electronics, Electrical Machines, Energy Control and Power Systems' was founded in 1999 with the goal of providing PhD students with the opportunity to broaden their knowledge. As a sponsor ECPE is supporting the PhD school with the acquisition of speakers from industry and organizes the Industry Day for Recruitment. Moreover ECPE sponsors the European PhD School Poster Award.



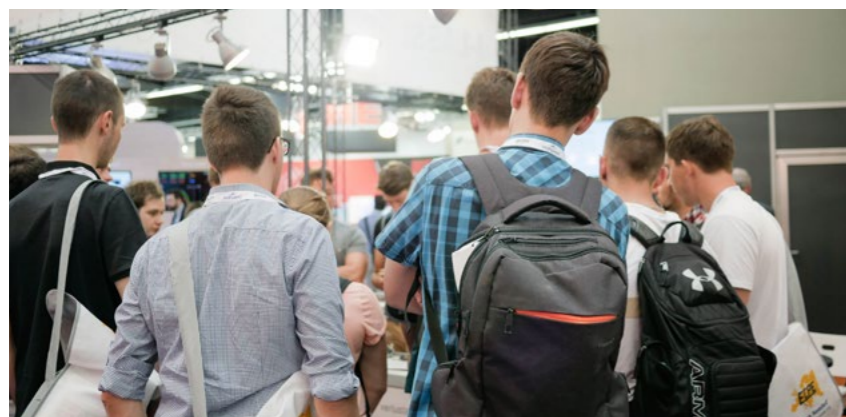
FREE for ECPE Members

## ECPE Job Forum

In the Job Forum on [www.ecpe.org](http://www.ecpe.org) network members have the possibility to publish open positions in the field of power electronics free of charge. In addition, there is a separate rubric for student positions for practical trainings, master thesis or working students.

## ECPE Students Day

One activity within the 'Young Engineer Needed' Programme is the ECPE Students Day organized in the frame of the PCIM Europe Exhibition.






# Contact

## ECPE Board of Directors



From left to right: Dr. Peter Steimer (ABB Switzerland), Ted Hopper (Macon), Peter Beckedahl (Semikron), Prof. Dr. Leo Lorenz, Dr. Stefan Weber (TDK Electronics), Hans-Peter Feustel (Conti Temic), Dr. Peter Friedrichs (Infineon Technologies), Dr. Torsten Leifert (Volkswagen), Philippe Loizelet (Schneider Electric), Prof. Rolf Hellinger (Siemens)

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