



# **European Technology and Innovation Platform Electronics for Energy Efficiency and Sustainability (EEESy)**

## **The Strategic Research Initiative for Efficient Electric Power Conversion**

The European Union's ambitious climate goals for the reduction of energy consumption and CO<sub>2</sub> emissions cannot be achieved without the extensive use of power electronics. After all, power electronics enables:

- the efficient feeding-in of wind and solar power to the grid,
- the stabilisation of the power grids while the share of fluctuating renewable energies is increasing,
- highly efficient variable speed motor drives,
- energy efficient and low emission mobility with electric and hybrid vehicles,
- energy-saving lighting technology and
- the efficient energy recovery.

Therefore, ECPE European Center for Power Electronics has initiated a European Technology and Innovation Platform 'Electronics for Energy Efficiency and Sustainability (EEESy)' to demonstrate the potential to improve energy efficiency by using innovative power electronics and to identify future research needs in this area. Furthermore, power electronics is a key and enabling technology for the increased use of renewables, for the energy feed-in as well as for the stabilisation of electricity grids with high level of power quality and availability.

Today, we have 36 official technology platforms registered in Brussels e.g. for smart system integration, smart grids, photovoltaics and wind energy. However, as a cross-functional technology power electronics is not adequately represented in these existing platforms. Based on the results of the European E4U Project (Electronics Enabling Efficient Energy Usage, [www.E4Efficiency.eu](http://www.E4Efficiency.eu)) and the ECPE Roadmap Programme, the Technology Platform will set up a Strategic Research Agenda for Europe, identifying future research needs in power electronics in its key applications. In the next step, the impact of future innovations on efficiency and sustainability will be deduced and quantified.

## 1. Background and ETP Initiators

The technology and innovation platform is driven by the ECPE Research Network and the European E4U Project, an initiative to develop a strategy for research in electronics for energy efficiency.

### 1.1 The European Power Electronics Network ECPE

ECPE European Center for Power Electronics founded in 2003 is an industry driven Research Network for Power Electronics in Europe. The ECPE Network comprises 40 member companies and 55 European universities and research institutes integrated in the network as so called Competence Centres. Figure 1 presents the ECPE Member companies and Competence Centres.



Fig. 1: ECPE Member Companies and Competence Centres

The key mission of the ECPE Network is to strengthen the cooperation between power electronics industry and universities on a European level to improve, in the long term, the competitive position of European power electronics industry.

The focus of ECPE activities is put on pre-competitive joint research, education and advanced training as well as public relations for power electronics in Europe.

#### Background and input of the ECPE Network to the ETP EESy:

- **Pan-European Industry-driven Network comprising**
  - 40 industrial members
  - 55 research and university institutes
- **Precompetitive Joint Research**
  - Network internal joint research programme with industrial funding
  - Involvement in European and national research programmes
- **Education and Advanced Training**
  - Expert seminars and workshops
  - Tutorials for young engineers in industry
  - Internet-based online course on power electronics
- **Public Relations for Power Electronics**
  - Awareness raising and image formation
  - Young engineers programme (ECPE Students Day, 'Kits for Kids', Sponsoring of Young Engineers Award at PCIM and CIPS Conference)
  - Exchange of information with power electronics organisations in US and Japan
- **Relevant ECPE Programmes**
  - ECPE Research & Technology Roadmaps
  - Energy Efficiency – the Role of Power Electronics
  - SiC User Forum and Reliability Task Force

## 1.2. The E4U Project 'Electronics Enabling Efficient Energy Usage'

The E4U Project (Electronics Enabling Efficient Energy Usage, [www.e4efficiency.eu](http://www.e4efficiency.eu)) has driven a European initiative to develop a strategy for research in electronics for energy efficiency. The project has analysed the strengths and weaknesses but also the opportunities of electronics research for energy efficiency and sustainability. Despite of top research groups and internationally renowned companies, the field is currently hampered by an insufficient public awareness for its potential. Also, economic conditions do not always support the take-up of energy efficient solutions. Moreover, there are clear shortcomings in strategies for funding longer-term research. This is why action at the European level is needed to improve the coherence between the different research and technology actors. It is vital to make the research and efficiency benefits of power electronics more visible and to attract more young people to this promising field.

The E4U project was funded by the European Commission in the ICT programme of FP7. The project has been coordinated by the Austrian research strategist eutema Technology Management. Project partners were the ECPE, the Universidad Politécnica de Madrid and the University College Cork, Ireland.

### Background and input of the E4U Project to the ETP EESy:

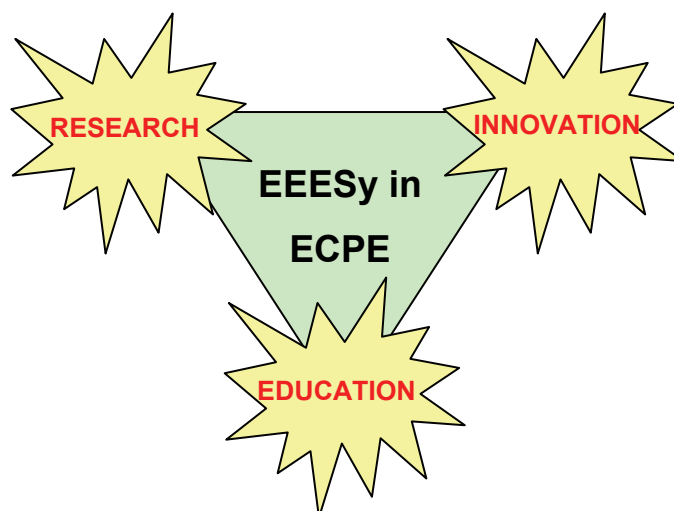
- E4U Strategic Action Plan
- SWOT Analyses and E4U Research Roadmaps
- RTD and non-RTD policy analysis and recommendations
- The methodology of strategic research agenda development
- Contacts and visibility in Europe
- Success stories for electronics improving energy efficiency
- PR and dissemination material e.g. the final publication booklet

## 2. Focus and Key Objectives of the ETP EESy

Power electronics is the enabling technology to efficiently generate, distribute and use electrical energy. It is a cross-functional technology covering the extreme high Giga Watt power in transmission lines down to the low milliwatt power needed to operate a mobile phone. Many market segments such as domestic and office appliances, computer and communication, ventilation, air conditioning and lighting, factory automation and drives, traction, automotive and renewable energy, can potentially benefit from the application of power electronics technology.

The main motivation to start the technology platform is to achieve awareness and acceptance of power electronics as a key technology to solve today's and tomorrow's energy related challenges. This important area has to be on the agenda of EC policy. Now is the time for strategic thinking and action at European level. Therefore, the European power electronics community has to agree on a common vision for the future role of power electronics in a coordinated strategic research agenda for power electronics for energy efficiency and sustainability. The official ETP status is expected to improve power electronics visibility on the European level especially in the future cooperation with existing ETPs e.g. in developing joint roadmaps or position papers.

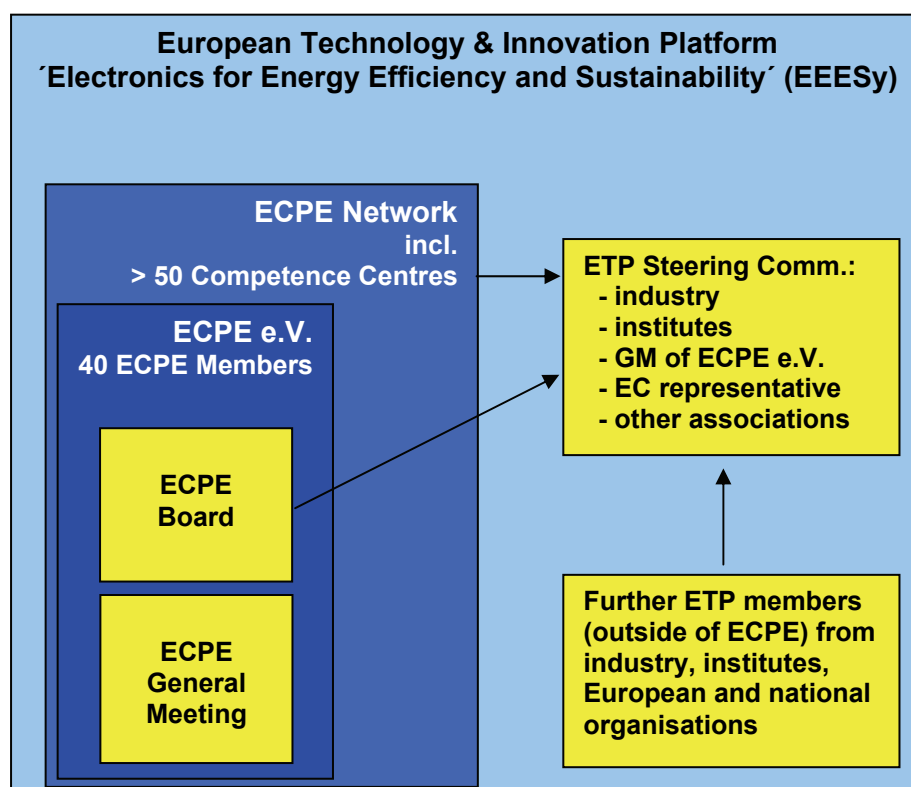
The **European Technology and Innovation Platform EESy** embedded in the ECPE Network is focussing on the triangle of Research, Innovation and Education.



### **3. The Structure of the ETP EEESy in the ECPE Network**

The ECPE Network with its 40 member companies (legal members of ECPE e.V.) and the 55 ECPE Competence Centres form the basis of the Technology and Innovation Platform. But EEESy will be open to non-ECPE members. The EPE - European Power Electronics and Drives Association and the European chapter of the IEEE Power Electronics Society (PELS) who have their focus more in the academia are invited to join the technology platform.

For the technology platform an EEESy Steering Committee will be installed as the decision making institution. It consists of representatives from industry and institutes, nominated by the ECPE Board and the ECPE Competence Centres, and further representatives e.g. from the European Commission and other associations in Europe. Furthermore, the general manager of ECPE e.V. has a seat in the EEESy Steering Committee. The structure of the technology platform in the ECPE Network is shown in figure 2.



**Fig. 2:** Structure of the ETP EEESy in the ECPE Network

### **4. Roadmap and Time Schedule for the ETP EEESy**

- Official decision of the ECPE Board on the ETP (✓)
- Information of ECPE Members and Competence Centres (✓)
- Invitation to EPE Association to join the ETP (✓)
- Discussion with NCP (✓)
- Official letter to the European Commission (week 5/2010)
- Official letters to national ministries in key member states via ECPE Members or Competence Centres (Feb. 2010)
- Appointment of EEESy Steering Committee (March 2010)
- Launching the EEESy web site [www.eeesy.eu](http://www.eeesy.eu) (Feb./March 2010)
- EEESy Kick-off Meeting in the frame of the ECPE Annual Event 2010 (18 March 2010)
- Presentation of 1<sup>st</sup> draft Strategic Research Agenda based on E4U results (March 2010)
- Presentation of EEESy Strategic Research Agenda (December 2010)