



**AECCTECH_NET¹, a network of
University Laboratories and Industry
R&D Laboratories to face the
challenges of the European
Commission's 6th Framework
Programme**



1. Background

Since April 2002, an important structuring effort of the Power Electronics and Electrical Drives community has been done by the EPE² Association. More than 40 R/D units from universities and companies representing 14 countries and over 600 full time researchers gathered their internationally proven expertise to face the challenges of the 6th Framework Programme.

The Sixth Framework Programme (FP6) is aiming at integrating, structuring and strengthening the European research. Therefore selected priorities have been defined and will be implemented through a stronger link with national, regional and other European initiatives. Furthermore, coordination and procedure simplification will underline the new programme structure.

Seven thematic priorities have been budgeted: Genomics and biotechnologies for health, Information society technologies, Nanotechnologies and nanosciences, Aeronautics and space, Food quality and safety, Sustainable development – global change and ecosystems, Citizens and governance in a knowledge-based society.

Space is further foreseen for specific activities covering a wider field of research in which support for SMEs³ and for EU new and emerging needs is to be found.

The concept of "European Research Area" has been introduced with substantial funding for research and innovation, human resources, research infrastructures, science and society and with special support for the coordination of activities and the support for the coherent development policies.

Among the thematic priorities considered, some have been identified as being a field for coordinated activities in the field of Power Electronics.

These thematic fields of interest are:

- Information society Technology
- Aeronautics and space
- Sustainable development, global change and ecosystems

For "Information society Technology", fields of interests could be:

"Software technologies architectures, distributed and embedded systems supporting the development of multifunctional and complex services that involve multiple actors engineering and control of complex and large-scale systems to ensure reliability and robustness".

For "Aeronautics and space", fields of interests are:

¹ AECCTECH_NET stands for Advanced Energy Conversion and Conditioning TECHNOlogies NETWORK

² EPE: European Power Electronics and Drives Association: Non profit International Association

³ SMEs: Small and Medium Enterprises

"Aeronautics and space: increase the competitiveness of the European industry with regard to civil aircraft,... equipment".

For "Sustainable development, global change and ecosystems", two main subfields of interests are to be found:

- *sustainable energy systems* and
- *sustainable surface transport*.

These are probably for us the main field of interest with respect of energy and transport policy. Particularly we recognize the following actions.

In the field of "*sustainable energy systems*", the role of power electronics must be emphasized in:

- "– clean energy, in particular renewable energy sources and their integration in the energy system, including storage, distribution and use;
- fuel cells and their applications;
- new technologies for energy carriers/transport and storage on a European scale, in particular hydrogen technology;
- new and advanced concepts in renewable energy technologies with a significant future energy potential and requiring long-term research efforts."

In the field of "*sustainable surface transport*", the role of power electronics must be emphasized in:

- "– Developing environmentally friendly transport systems and means of transport of passengers and freight, and clean urban transport with rational use of the car in the city: new technologies and concepts for surface transport, including novel propulsion systems and integration of fuel cells for transport purposes; advanced design and production techniques leading to improved quality, safety, recyclability, comfort and cost-effectiveness;
- Making rail and maritime transport more effective and more competitive addressing the interoperability of transport modes, and assuring intelligent and safe transport of passengers and freight."

Energy Conversion and Conditioning Technology (ECCT) is a key tool for achieving the objectives of FP6, for improving the quality of life and indoor/outdoor environment, for sustainable energy production, for reduction of greenhouse gas emissions, for sustainable agro-food systems and for water and soil reconditioning. Advances in ECCT⁴, exploiting new power electronic components, systems, energy conversion devices and system control regimes, are both fundamental and crucial for the development of the clean, efficient and sustainable technology of the future. In 1997 already, it was estimated that over 50 % of the European and US electricity consumption passed through electronic conversion and conditioning equipment and today, 100 % of the production of electricity based on alternative energy sources must undergo a conditioning through ECCT equipment before use. For short, ECCT represents a horizontal path through several thematic priorities of FP6.

2. Aims

ECCT is a hidden technology. It is not an end-product for daily use as a mobile phone or a TV-set, it is not a prestigious industry as the space industry or the automobile industry, so it is not in the News, and as such it is forgotten. But it is everywhere. Therefore, in order to optimize the economical efficiency of the research projects, there is a strong need to develop a strategy to rationalise the research in the field, optimise the products and develop a common technological basis. Technological progresses in that area will benefit all other industrial sectors.

Despite the excellence of many laboratories, the present lack of co-operation and of critical mass is one of the major hurdles to the progress, rationalization and development of ECCT in our cities, industries and infrastructures. A mobilization of activities and resources is then necessary in order to improve the dimension, the equipment and effectiveness of laboratories, the exchange of scientific and technical information, the mobility of young researchers, the development of joint research programmes and the collaboration between academic and industrial R/D centers, the attractiveness for women, the number of graduate students in this area.

⁴ ECCT: Energy Conversion and Conditioning Technology

AECCTECH_NET based on the EPE association structure is aiming at all this. It is an informal network to exchange well selected information related to the various calls issued by the European Commission. It aims at promoting the excellence of the partners and find opportunities for each of them to enter FP6 applications. During FP6, it will act in the field of the topics described in the "Position paper" sent to the EU Commission in order to attract attention on the necessity to include ECCT activities in its programme. It will further take the following steps to maintain activities in the following EU framework programmes and to continue en reinforce the necessary networking action initiated with FP6.

AECCTECH_NET is not a closed club and potential candidates are invited to join EPE and this Network to help defining and strengthening the lobbying action on research fields to be submitted to the EU Commission to meet the FP6 challenges.

3. Guidance

The management of the network's activities lies in the hand of the so-called "Guidance committee". These committee members are partners, members of EPE Association and members of the EPE Association Executive Council. They check the work done by the EPE secretariat and give advise regarding the choice of priorities among the various opportunities offered in FP6 to maximize the result of the initiative. Guidance committee members are:

Greg Asher	University of Nottingham, United Kingdom
Roger Bassett	Alstom Research & Technology Centre
Bernard Davat	ENSEM, GREEN, INPL, Nancy, France
Rik De Doncker	RWTH-ISEA, Aachen, Germany
Bernard de Fornel	LEEI, ENSEEIHT, INP Toulouse, France
Braham Ferreira	Technische Universiteit Delft, The Netherlands
Wlod Koczara	Technical University of Warsaw, Poland
Johann Kolar	ETH Zurich, Switzerland
Philippe Lataire	ETEC, Vrije Universiteit Brussel, Belgium
Gaston Maggetto	ETEC, Vrije Universiteit Brussel, Belgium
Yves Perriard	Ecole Polytechnique Fédérale de Lausanne, Switzerland
Francesco Profumo	Politecnico di Torino, Italy
Leonids Ribickis	Riga Technical University, Latvia
Jean-Pierre Rognon	LEG-ENSIEG, INP Grenoble, France
Walter Schumacher	Technische Universität Braunschweig Carolo-Wilhelmina, Braunschweig, Germany
Tore Undeland	Norwegian University of Science & Technology, Trondheim, Norway

4. Participation fee

Considering the continuous effort and time needed from the EPE secretariat some financial support to this activity is requested. A fee of 2000 EUR per participating European unit is the contribution to be a partner in the network to allow the secretariat to perform this networking and information activity that should end up with a number of applications. For units from a candidate European country the fee of 1000 EUR is requested, taking into account the proportionality in the financial support that can be expected from the FP6.

For this fee, partners have access to the network; they receive relevant information related to the activities of the EC regarding the field of Power Electronics and Electrical Drives, i.e. analysis of the "Calls" when issued, contact opportunities, report of activities, support for applications.

5. List of partners' competencies in relation with FP6

- Large innovative wind turbines, components and design tools
- Low cost photovoltaic modules with integrated dc/ac inverters that can feed directly into the grid
- Innovative wind turbines, components and design tools
- New generation of PV technologies / products
- RES-Electricity

- Distributed electricity generation
- Electricity storage systems
- High temperature FC
- Solid Polymer FC
- FC for small portable apparatus
- New demand driven solutions for implementation of DER
- Components for T&D network with DER
- Advanced energy storage
- Transmission systems
- Energy storage for grid connected
- High temperature superconductors
- PV systems including Mega-Watt-size PV plants
- Development of new components and auxiliary systems (WP p.7)
- Integration zero or near-zero emission propulsion systems and components (WP p. 7)
- Future generation of clean and economical engines for cars (WP p. 7)
- Virtual institute for advanced combustion to develop clean and quiet power trains for road transport (WP p.8)
- Virtual centre for technology innovation and knowledge management in the railway sector (WP p.8)
- Promoting SME
- Simulation dissemination and exploitation of results
- Realizing the ERA
- Promoting candidate countries participation
- Stimulating international co-operation

6. Contact

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7. Annex

“Position paper about the major input of Energy Conversion and Conditioning Technology to European Key Priorities”