



Power Electronics Research & Development in Europe - An Overview

European research policy and the related economic and social policy of the European Commission is organized in multiannual EU Framework Programmes for Research and Innovation covering a variety of funding programmes and calls. Presently, we have the 8th framework programme called **Horizon 2020** for the period 2014-2020. The Commission has already published its proposal for **Horizon Europe**, an ambitious €100 billion research and innovation programme that will succeed Horizon 2020.

The work programmes in Horizon 2020 have several focus areas where power electronics is involved. '**Leadership in Enabling and Industrial Technologies**' covering nanotechnologies, advanced materials, advanced manufacturing and processing as well as information and communication technologies, is addressing materials and technology-related topics whereas the '**Societal Challenges**' are addressing the systems and applications side. From power electronics point of view the most relevant Societal Challenges are (i) secure, clean and efficient energy and (ii) smart, green and integrated transport.

Furthermore, Europe has the so-called Joint Undertakings e.g. **ECSEL - the Public-Private Partnership for Electronic Components and Systems** – funding Research, Development and Innovation projects. Through the ECSEL JU, the European industry including SMEs as well as research and technology organisations are supported and co-financed by 30 ECSEL participating states and the European Union. The overall ECSEL budget is about € 4.8 billion for the period 2014 to 2020. ECSEL is addressing **semiconductor-related essential capabilities** from equipment, materials and processing up to systems integration as well as **key application areas** e.g. in transport and mobility, energy and digital industry. From power electronics point of view the ECSEL programme has a strong focus on Si 300mm technologies for power, on SiC and GaN technologies and systems for various applications e.g. in e-mobility and energy/grids.

Compared to the large European flagship programmes, the **ECPE Joint Research Programme** is small but much more focused. The annual budget coming from the ECPE companies is used for contract research with the university and research institutes from the ECPE Network. Research topics cover technology development in packaging and system integration, the demonstration on system level as well as characterisation, testing, reliability and condition monitoring in power electronics. Recently, ECPE has started the Lighthouse Programme on modular and scalable Power Electronics Building Blocks (msPEBB) addressing the challenges of wide bandgap power electronics related to fast switching and highest power density.