

Welcome Address

19th International Forum on Advanced Microsystems
for Automotive Applications

Berlin, July 7, 2015

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The Unit Electronic Systems; Electromobility

- Part of the Directorate “Innovation for Society“ within the Directorate General “Key Technologies – Research for Innovation”



Funding areas

- Funding for **Electronic Systems** R&I since 2000: **nearly € 2bn**
 - more fundamental research projects
 - **design and fabrication technologies**
 - **integration technologies**
 - **sensor systems**
 - manufacturing equipment for electronics
- Funding for **Electromobility** R&I since 2008: **more than € 300m**
 - **thermal, energy and battery management**
 - **drive trains**
 - **power electronics**
 - vehicle concepts
 - (battery technology and lightweight engineering)

Automotive electronics and sensor systems

- **Long-term area of interest** of the BMBF
- **Key to innovation** in the automotive sector
- **Enabler of future mobility concepts**, leading towards automated and sustainable transport
- **Key competence** in Germany, in particular among SMEs
- Covered in recent **call „e-MOBILIZE“ (funding: € 28m)**, focusing on:
 - **electronic components and E/E architecture for efficient EVs**
 - **functions and components for efficient automated driving of EVs**

Example: Motor with integrated power electronics

Project “EMiLE” (2013-2016)

Goals

- save ~50 % space and costs

Approach

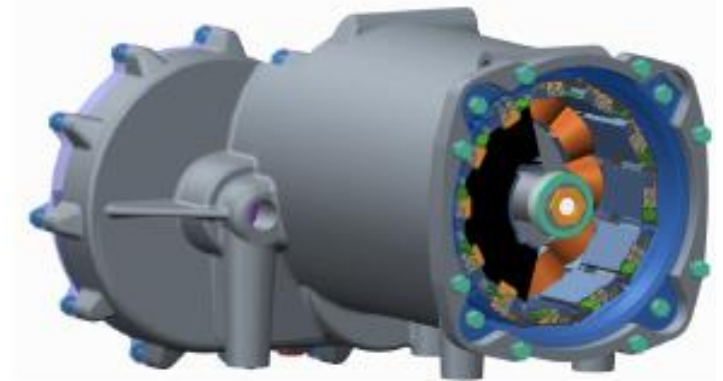
- integrate inverter and control logic in each stator tooth

Advantages

- improved EMC
- easy cooling

Innovation

- compact multiphase design
- modular „smart stator teeth“



Source: EMiLE consortium

Partners

- VW, Bosch, Siemens, Lenze, ZF
Friedrichshafen, Infineon, Epcos, AixControl
- RWTH Aachen, Fraunhofer IISB

The Cluster Electric Mobility South-West

Topics:

- Automotive engineering
- Energy and supply engineering
- ICT and corresponding services
- Production technologies



Funding:

- Two phases (2012–2017)
- Total budget € 40m

Organisation:

- 80 partners, incl. more than 20 SMEs and universities and research institutes
- Internationally connected, e. g., with France, China, Japan

Example: Automated parking and charging

Project “AUTOPLES” (2013-2015)

Goals

- leave parking and charging to the vehicle, even in large garages

Approach

- navigate using existing vehicle sensors
- use robots for conductive and inductive charging

Advantages

- easy handling, low costs, for fleets

Innovation

- charging to suit the user’s time target
- business models for fleets



Source: AUTOPLES consortium

Partners

- TransEnergyPartners, CTC, Lapp Systems, IPT Technology
- FZI Karlsruhe

ECSEL – a success for R&D&I in Europe

- „Electronic components and systems for European Leadership“
- Main instrument for funding pan-European R&D&I
- German projects jointly funded by the **BMBF** (up to **500 M €**), the Free State of **Saxony** (up to **200 M €**), the European Commission and participants
- ECSEL Calls 2014: **11 projects** selected for funding (total funding: € 355m), of which 8 with German partners (7 already started), addressing, e.g.:
 - E/E architecture for EVs
 - sensor platform for advanced driver assistance systems
 - pilot production line for power semiconductors

PENTA – a new EUREKA cluster (start: 2016)

- industry initiative for a new R&D cluster on micro- and nanoelectronics and their applications with an emphasis on
 - Mobility
 - Healthcare
 - Production technologies
 - SME engagement
- granted the EUREKA label on July 1 (supported by Belgium, France, Germany, Hungary, The Netherlands, Spain and Turkey)
- envisaged for R&I projects of shared high national interest

Example: Electronic design automation (EDA) for automotive electronics

EUREKA-CATRENE project “RESIST” (2014-2017)

Goals

- fast integration of new technologies from consumer electronics in automotive applications

Approach

- develop new EDA tools and methods

Advantages

- faster innovation cycles

Innovation

- enhanced functionality, reliability and resilience of components and systems



Source: RESIST consortium

Partners

- Airbus, Bosch, Fraunhofer IIS/EAS, Hochschule Reutlingen, Infineon, MunEDA, NXP, TU Munich, University of Bremen, VW
- 11 partners from FR and NL

Outlook

- We are currently developing a research and innovation **programme in microelectronics** with the Federal **Ministry for Economic Affairs and Energy** (BMWi)
- We are involved in **strategic talks on automated driving** with the Federal **Ministry of Transport** and Digital Infrastructure
- We will strengthen **synergies between European and German funding programmes** beyond ECSEL (e.g., H2020 ICT and Transport programmes, European Green Vehicles Initiative)
- We will assess the **impact of global technology developments** on value chains jointly with the EU

Nurturing **talent** in e-mobility

DRIVE-E Programme

Target audience

- engineering and science students

Objective

- stimulate the creation of innovations and business ideas
- promote careers in electric mobility
- help to create a network

Actions

- Spring school with talks by leading experts, creativity workshops, factory and lab tours
- Prizes for theses and dissertations



www.drive-e.org

Thank you for your attention!

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