Welcome Address
18th International Forum on Advanced Microsystems for Automotive Applications

Dr. Stefan Mengel
Federal Ministry of Education and Research (BMBF), Germany
Unit Electronics Systems; Electromobility
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Outline

Electric Mobility – Rethinking the Car

European and national Strategy for Microelectronics
Electric Mobility - Rethinking the Car…

…is put forward by a 2009 National Development Plan for Electric Mobility

…is a joint endeavor by 4 federal ministries
   (economics, environment, transport, research)

…combines low carbon strategies with industrial and energy policy

…with a strong focus on research and innovation
   – no subsidies for cars
Electric Mobility - Rethinking the Car...

... needs a systemic approach
Electric Mobility - Rethinking the Car

The Scenario

**Early Adopters**
- Phase I 2011-2014
  - Pre-market
  - high TCO differential
  - small customer base with high disposable income and interest in environmental issues
  - limited supply (esp. from German producers)
  - limited market size (growing slowly)
  - incentives have limited absolute but high relative effect on vehicle numbers
  - limited supply restricts market penetration

**Sustained Market Growth**
- Phase II 2015-2017
  - Market Ramp-up
  - falling TCO differential
  - larger potential customer base
  - greater market segment penetration/increasing supply
  - increase in market size
  - decisive phase for market ramp-up
  - relatively modest incentives have substantial effect on market growth
  - increased supply aids market penetration

**Mass Market**
- Phase III 2018-2020
  - Early mass market
  - low TCO differential
  - stable growth/demand
  - diverse supply/market segment penetration
  - high visibility of xEVs
  - increasingly self-sustaining electric vehicles market
  - incentives stabilise market growth, need for incentives declines

Customer Group Development
- Commercial
- Private

1,000 vehicles

Strong focus on research and innovation

• 82 collaborative research projects with 1,2 billion Euro additional funding (BMBF 0,63 billion).

• Industry has committed an investment of 17 billion Euro

• Broad range of topics (battery technology, electric motors, lightweight construction, innovative business models, standards, education, drivetrains, new vehicle concepts, charging infrastructure, power electronics for energy and thermal management, power grid integration, production technology)

• Broad range of instruments (classical R&D projects, cluster initiatives, show case demonstrators, international cooperation)

• Broad range of TRL, including higher TRL
Research Examples

• Using NIR and FIR sensor data fusion developed within the project ProPedes, pedestrians at distances of up to 127 m can be detected with 93% reliability – up from 78% for a single sensor.

• A highly integrated powertrain with smart controls, developed within the ENIAC project MotorBrain, is projected to reduce energy losses by more than 24% and motor weight by 15% compared to the state of the art.
Outline

Electric Mobility – Rethinking the Car

European and national Strategy for Microelectronics
European and national Strategy for Microelectronics

Europe

European Electronics Strategy launched 2013
Implementation by ECSEL-Initiative 2014

Germany

Implementation via a national strategy with strong entanglement with ECSEL.
European and national Strategy for Microelectronics

Germany

Focus on More-than-Moore, power electronics, chip based security, design.

High tech capability of industry in Europe and Germany is key to shape the future of manufacturing, mobility, health.
European and national Strategy for Microelectronics

Current R&I Funding in the Field of Electronic Systems

- The BMBF’s total funding since 2000 in micro- and nanoelectronics, microperiphery, and microsystems amounts to nearly € 2 Bln
- Our funding covers targeted research as well as projects on design and fabrication technologies, integration technologies, sensor systems and manufacturing equipment for electronics
- The BMBF provided more than € 70 M in funding for the last two national calls relating to power electronics, enabling more than 40 projects
- Based on an agenda process the funding program will be revised; first result: a national call addressing “Electronic and sensor systems for Industry 4.0” (i. e., cyber-physical systems in an industrial context) in 2014
Selected Topics for Future Mobility

• Highly integrated and modular drivetrains
• Energy efficient and material efficient drives
• Battery management and safety
• Energy efficient electronics for automotive applications
• Energy efficient ECUs
• Efficient on-board energy and thermal management systems
• Secure Car-2-X communication units, methods and standards
• Advanced driver assistance systems
• Components and functions for automated driving and charging
Thank you for your attention

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