ECS-SRA
Electronic Components and Systems
Strategic Research Agenda
Long Term Vision
Long term vision for Electronic Components and Systems

Objective:

To identify basic research subjects (TRL1-2) that will need to be developed in the short term in order to enable the realisation of the European industrial roadmap in the medium term (5-10 years) and long term (>10 years).
Technology evolution and application requirements

Application requirements

Short Term
Performance
Novel functionality
Cost reduction

Medium Term
Performance
Novel functionality
Cost reduction

Long Term
Performance
Novel functionality
Cost reduction

Gaps

Convergence

No solution available

Technology evolution

Figure of Merit
Novel functionality

No solution available

Other disruptive applications based on technology evolution

www.nereid-h2020.eu
Grant Agreement 685559
Digital Industry

• SPIRE 2020 Roadmap
  • Replacement of fossil-based materials
  • Re-use of waste streams
  • Resource-efficient applications

• New production schemes:
  • Modular factories
  • End-user driven agile production
  • Hyper-connected factories
Transport and Mobility

• EU policy:
  • Emissions from transport to be reduced with >60% below 1990 levels by 2050
  • “Vision Zero” long-term goal of zero road fatalities in the EU by 2050

• Scenarios:
  • Autonomous electrically driven vehicles
  • All road users connected
  • Fully integrated multi-modal traffic
Health & Wellbeing

- Digital Medicine
  - Personalized medicine
  - 3D-bioprinting for bone grafts, scaffolds artificial organs...
  - Cyborgization

**Health.E**
Accelerate innovation in medical devices by ECS-based technology platforms: ‘Moore for Medical’
Energy Management

- Energy roadmap 2050
  - Ensuring sustainable power generation and energy conversion; complete decarbonisation of power sector
  - Achieving efficient community energy management
  - Reducing energy consumption
- Scenarios:
  - Long-term evolution of mid-term technological solutions
- Market disruptions:
  - Completely decentralised system
  - Zero marginal-cost energy?

GHG Emissions reduction target 2050
New computing paradigms ‘Beyond CMOS’

• Emerging High Performance Computing (HPC) technologies
  • Spintronics, neuromorphic computing, phononic computing, molecular electronics,…

• Quantum computing
  • Quantum sensing and metrology
  • Secure communication networks

(Courtesy M. Costache (ICN2) / NEREID)
Process Technology, Equipment and Materials

- New materials and processing for high performance / ultra-low power terascale integration and autonomous nanosystems
  - 2D, 1D materials, nanowires
  - Novel switches: NCFET, TFET, NEMS-FET, CNT-FET, …
  - Novel memories: OxRAM, MRAM, FeFET,…

(Courtesy NEREID)
NEREID Roadmap

Download or order your free copy!

From Nanodevices and Innovative Materials to System Integration

Prefinal Roadmap available since September 3, 2018

Download/Order your free copy at: https://www.nereid-h2020.eu/roadmap

• NEREID: „Nanoelectronics Roadmap for Europe“
• available in December
• as PDF or printed copy
• Download or order at: www.nereid-h2020.eu/roadmap