IPCEI on Microelectronics - a strong European Microelectronics industry for the digital future in Europe

Jens Fabrowsky,
Executive Vice President Automotive Electronics
Robert Bosch GmbH
Bosch – Four business sectors

- Mobility Solutions
- Industrial Technology
- Energy & Building Technology
- Consumer Goods
MEMS Sensors

- Acceleration / angular rate sensors
  For airbag systems, driver information, vehicle dynamics systems, active suspension systems, consumer devices

- Optical microsystems
  For consumer devices, IoT applications, home appliances, head-up displays

- Pressure Sensors
  For airbag systems, engine management systems, transmission control systems, consumer devices, IoT solutions

Semiconductors

- SoCs, system ASICs and sensor ASICs
  For specific automotive applications

- Power semiconductors and modules
  Low voltage power semiconductors for various automotive applications and robust high voltage power modules for electric powertrain inverters

- IP modules for µC integration
  Individual functions, developed in Reutlingen for licensing
Trends and Challenges

Electrified

Connected

Automated

Intelligent
Microelectronics – enabling our lives and industries.
Distribution of Total Semiconductor Production 2018 and Vendor Ranking of Automotive Semiconductors * 2018

Total Sales 2018
$469 Billion

Auto 12.7%
(2000, 5.6%)

Source: Strategy Analytics, WSTS, Bosch

* incl. MEMS Sensors
Microelectronics are a key technology for meeting challenges of the application domains in a CO2 neutral and digital society.
Semiconductors are the basis for European value chains

World Electronic Value Chain in 2018

- **European strengths (examples)**
  - Vehicles, Industry, Medical Equipment
  - Automotive systems, Medical, Industry
  - SoC, smart power, sensors, security, μC
  - Manufacturing mixed signal >22nm, Special (MEMS, SiC, Power)
  - Tools, Lithography, Automation,

Source: DECISION for the study: Emerging Technologies in Electronic Components and Systems - Opportunities Ahead (DG CONNECT, 2019)
IPCEI goes the step to First Industrial Deployment (FID)

Objectives

• Global Competitiveness

• Enabling strategic European value chains

• Strong, sustainable manufacturing, R&D, innovation

• Trustability and Sovereignty

Sources: Bosch, depositphotos
### Project Management

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### Dissemination and communication

- 01.2017-12.2020/2022
- Balanced FID and R&D
- Significant Spillover Measures
- National Funding

Source: ipcei-me.eu
IPCEI 2019 Outcomes and Perspectives

- « Bernin 2 conversion »
  300mm SOI substrates «new generation»

- « Bernin 3 production line »
  Creation of a new production line for Piezo On Insulator substrates (RF filters)

- « 5G » 300mm SOI Capacity Extension
  2000m² Building Permit obtained August 2019

- « Substrate Innovation Center »
  R&D SOI fabrication line in Leti

New infrastructures in purple
Up to 700 new employees in European R&D and Production
STMicroelectronics
New Investments supported by the IPCEI initiative in France and Italy:

- 300mm Crolles Gateway extension and **and**
  - RDI and First Industrial Deployment in French ST’s sites and labs
  - Technology development and new circuits on FD-SOI, embedded NVM, Imaging Sensors, Power GaN, etc.

- R3 300mm construction in Agrate
  - RDI and First Industrial Deployment in Italian ST’s sites and labs
  - Technology development and new circuits on BCD, MEMS, SiC, RF GaN, Digital microprocessors, etc.
Semiconductor Fab in Dresden

- R&D and First Industrial Deployment Power
- Start of Pilot Production end of 2021
- Up to 500 new employees in European R&D and Production

SiC Line in Reutlingen

- Differentiating new tech for electric mobility and renewables
- Opportunity for European Leadership

Bosch to produce range-boosting microchips for EVs

Bosch to Make Silicon Carbide Chips in Electric Vehicle Range-Anxiety Play
New EUV Optics Fab in Oberkochen

• R&D and First Industrial Deployment for next generation High NA EUV Optics

• First high NA EUV optics system manufacturing has started

• About 1000 new employees for R&D and production in Europe since project start
22FDX in Fab 1 is a proof point for GF’s successful diversification strategy!

Globalfoundries sees success for its diversification strategy

EU unterstützt Mikroelektronik mit 1,75 Mrd Euro
Current challenges

The Dallas Morning News
Texas Instruments to build $3.1 billion chip plant, create nearly 500 jobs in Richardson

The semiconductor maker will receive more than $5.1 million from the Texas Enterprise Fund, state's so-called deal closer fund. It's also eligible for as much as $275 million in tax breaks from Collin County, Plano ISD and Richardson.

CNBC
Trump’s 15% tariffs on $112 billion in Chinese goods take effect

China Big Fund to spend over CNY 200 billion in 2nd-phase support for local chipmakers

Shinee Wu, Taipei, Jesse Shen, DIGITIMES  🕒 Monday 28 October 2019

We have achieved a lot – **and have some way to go**
Summary and Outlook

• IPCEI on Microelectronics is a success!
  - Stimulating substantial investment
  - Jobs and Know-How in Europe

• IPCEI tool can be improved further,
  - to attract more industrial investment in microelectronics in Europe

• International challenges remain, have even increased

• Need for European technology sovereignty is evident

• Europe has strong opportunities in emerging microelectronics technologies needed to serve megatrends and achieve societal goals.

Europe needs to continue to act jointly to achieve technological sovereignty, and to keep and strengthen it’s strategic manufacturing base in microelectronics.

IPCEI are an important tool to bring technology to the level of First Industrial Deployment and should be continued and further developed.