Automotive related WICC
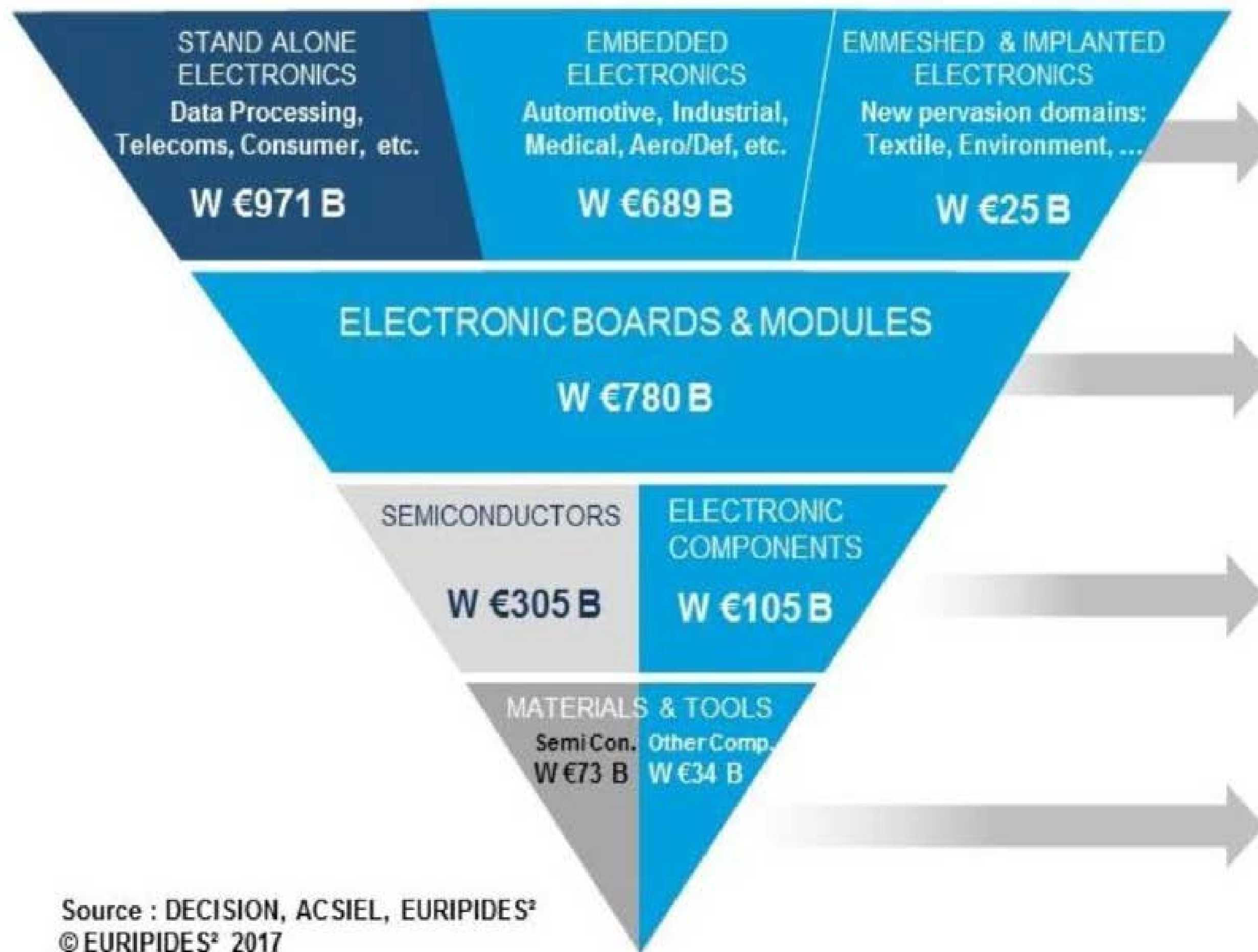

Tomáš Trpišovský, 18. 9. 2019 IMAinfoday Praha

Are we all together capable ?

Nanoelectronics Roadmap for Europe

Electronics and Semiconductor Industry Value Chain in 2016

STAND ALONE ELECTRONICS Data Processing, Telecoms, Consumer, etc. W €971 B	EMBEDDED ELECTRONICS Automotive, Industrial, Medical, Aero/Def, etc. W €689 B	EMMESHED & IMPLANTED ELECTRONICS New pervasion domains: Textile, Environment, ... W €25 B

ELECTRONIC BOARDS & MODULES — W €780 B

SEMICONDUCTORS W €305 B / ELECTRONIC COMPONENTS W €105 B

MATERIALS & TOOLS — Semi Con. W €73 B / Other Comp. W €34 B

	Prod in Europe (€ B)	% Europe / World
Level 4	253	15%
Of which Embedded Electronics	189	27%
Level 3	75	10%
Level 2	43	10%
Level 1	28	26%
Of which SC	21	29%

Source : DECISION, ACSIEL, EURIPIDES²
© EURIPIDES² 2017

Do we still control novelties..?

…and the impact of their exploitation?

More Moore
- 10 nm - parallel-quantum-………-edge-cloud computing
- *Human nerve: Ø2 µm / potential -30+70mV / signal speed 7m/s (brain -> leg = distance of 15m on highway)*
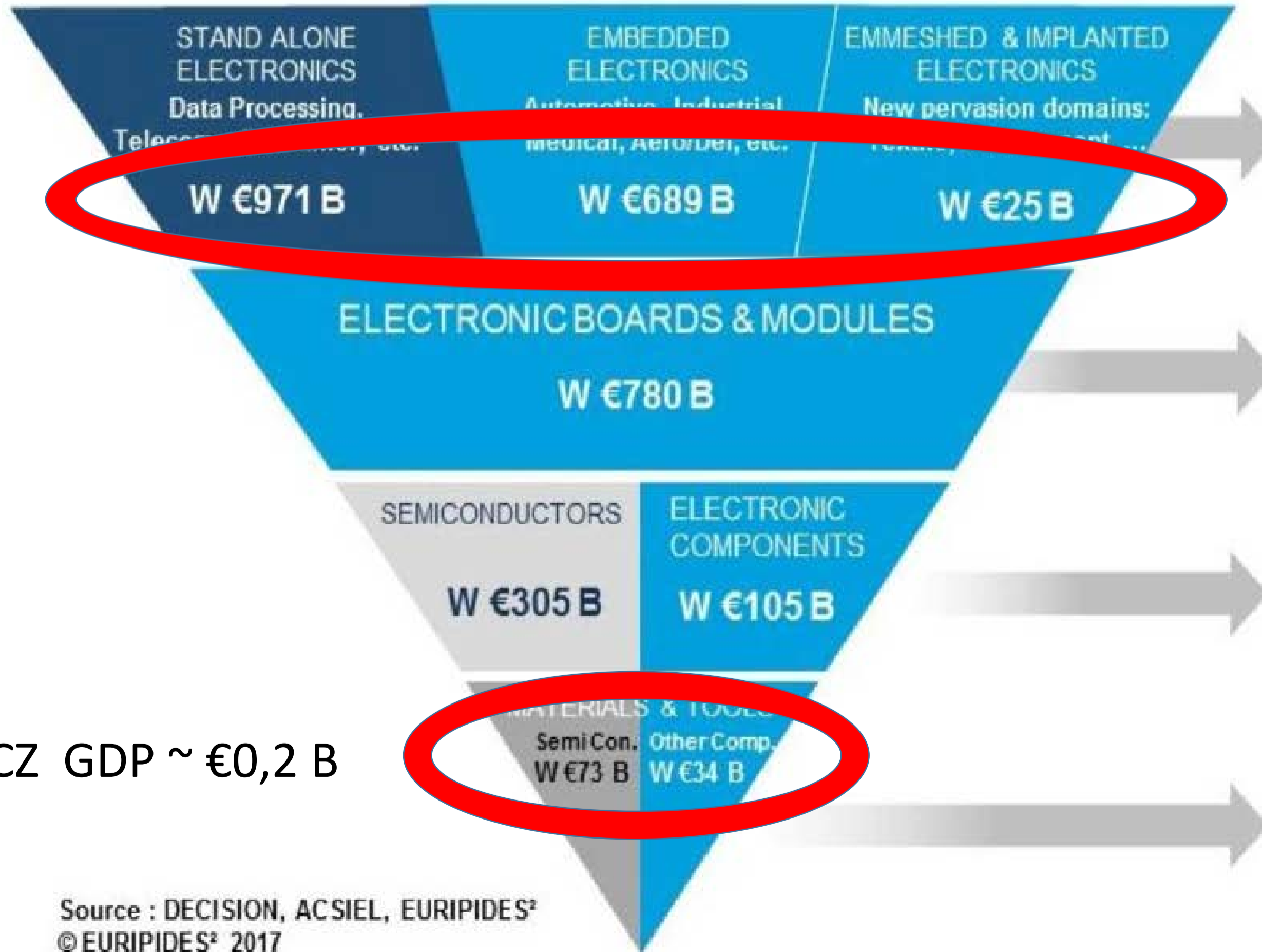
More than Moore
- (RF) devices
- Power management subsystems
- Passive components
- Biochips
- Sensors, actuators
- Microelectromechanical systems (MEMS)

Beyond CMOS

Are we all together capable ?

Nanoelectronics Roadmap for Europe
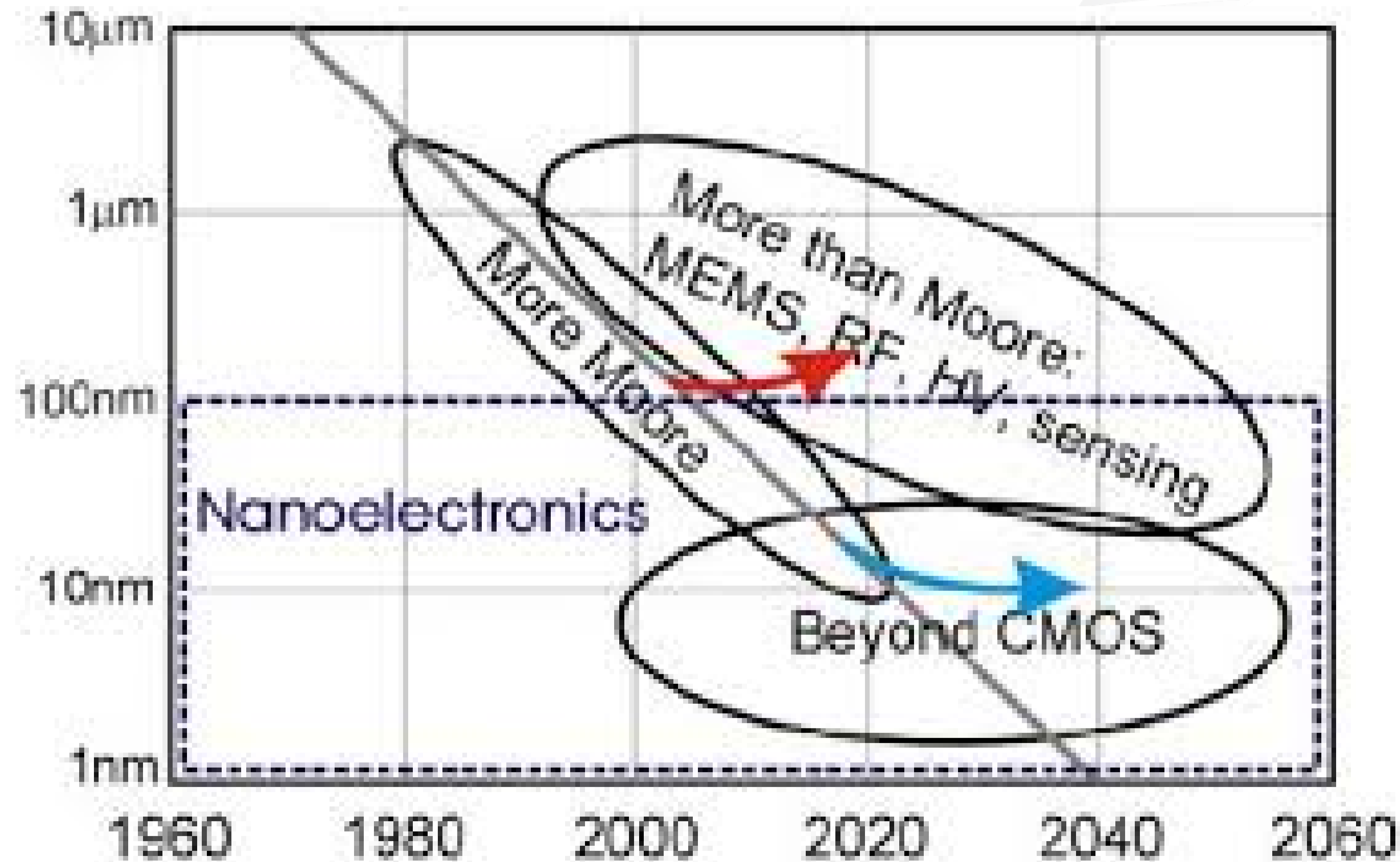
Electronics and Semiconductor Industry Value Chain in 2016

STAND ALONE ELECTRONICS	EMBEDDED ELECTRONICS	EMMESHED & IMPLANTED ELECTRONICS
Data Processing,	Automotive, Industrial	New pervasion domains:
W €971 B	W €689 B	W €25 B

ELECTRONIC BOARDS & MODULES
W €780 B

SEMICONDUCTORS	ELECTRONIC COMPONENTS
W €305 B	W €105 B

Semi Con.	Other Comp.
W €73 B	W €34 B

CZ GDP ~ €0,2 B

Source : DECISION, ACSIEL, EURIPIDES²
© EURIPIDES² 2017

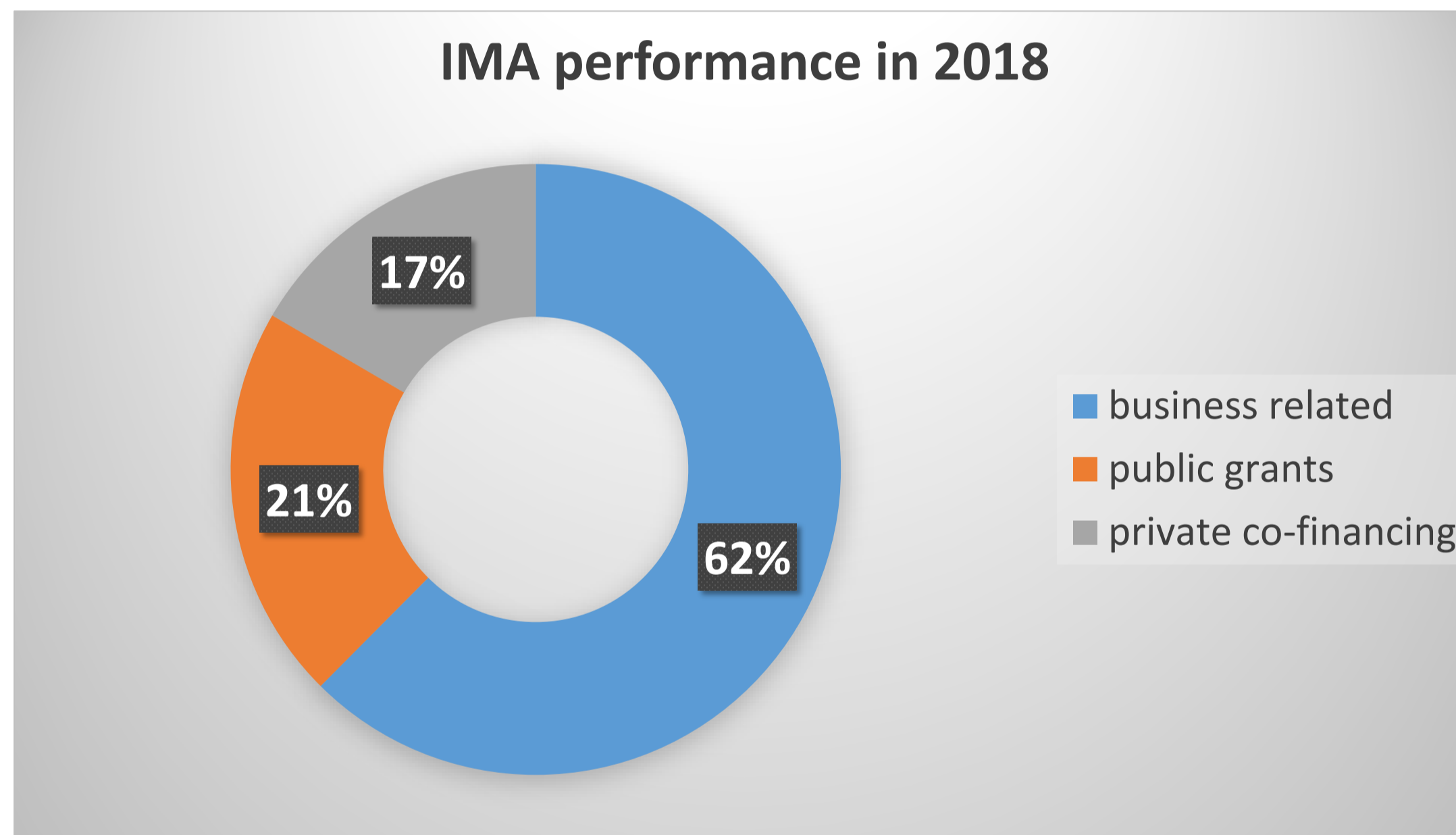|	Prod in Europe (€ B)	% Europe / World
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4

Do we still control novelties..?

IMA at a glance

Status

- IMA is located in **Praha, Pardubice Czech Republic**

- **Headcount 85 / ~35 involved in R&I**

- 2018 Performance **> €5 M**

- **Core business: eID systems & Apps**

- ~25 R&D active projects majority IoT and Automotive

- EFECS 2018 Lisbon
  European Forum for Electronics Components and Systems
  EFECS 2019 Helsinki

IMA at a glance

Status

IMA performance in 2018

17%

21%

62%

- business related
- public grants
- private co-financing

WITTE Automotive GmbH since 2018

„WICC" concept drafted

Cyber Security for Cross Domain Reliable Dependable Automated Systems

DEMO I: Autonomous Driving (leader **TNO)**

     Location: TNO Helmond, Netherlands

DEMO II: Driver Monitoring (leader **FICO-ADAS)**

     Location: CSIC premises, Spain

DEMO III: **Security and Privacy** (leader **IMA)**

     Location: IMA premises, CZ

**SECREDAS will spend over €51 million
on development of Secure and Safe Automated Systems**

Cyber Security for Cross Domain Reliable Dependable Automated Systems
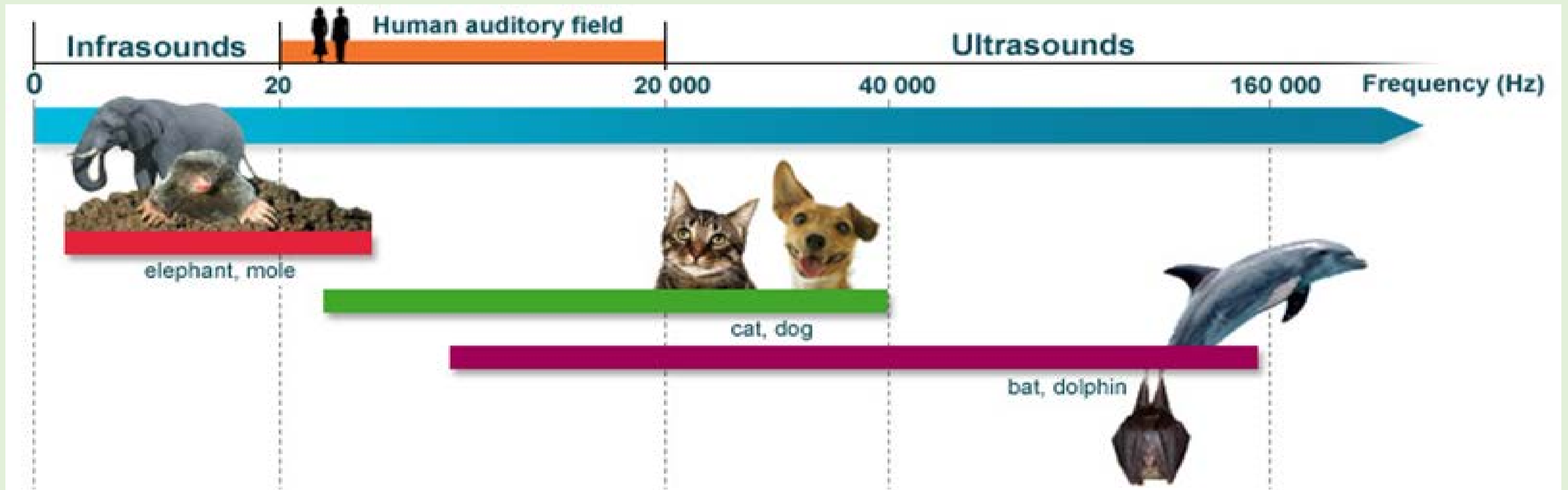

1 Camera
2 LIDAR
3 GPS
4 IMU
5 PC
6 A/D I/O modules
7 Touch screen
8 Actuators switches

Trunk

HMI

(ultra)Sound Interfaces and Low Energy iNtegrated SEnsors

Infrasounds — Human auditory field — Ultrasounds

Frequency (Hz): 0 — 20 — 20 000 — 40 000 — 160 000

elephant, mole
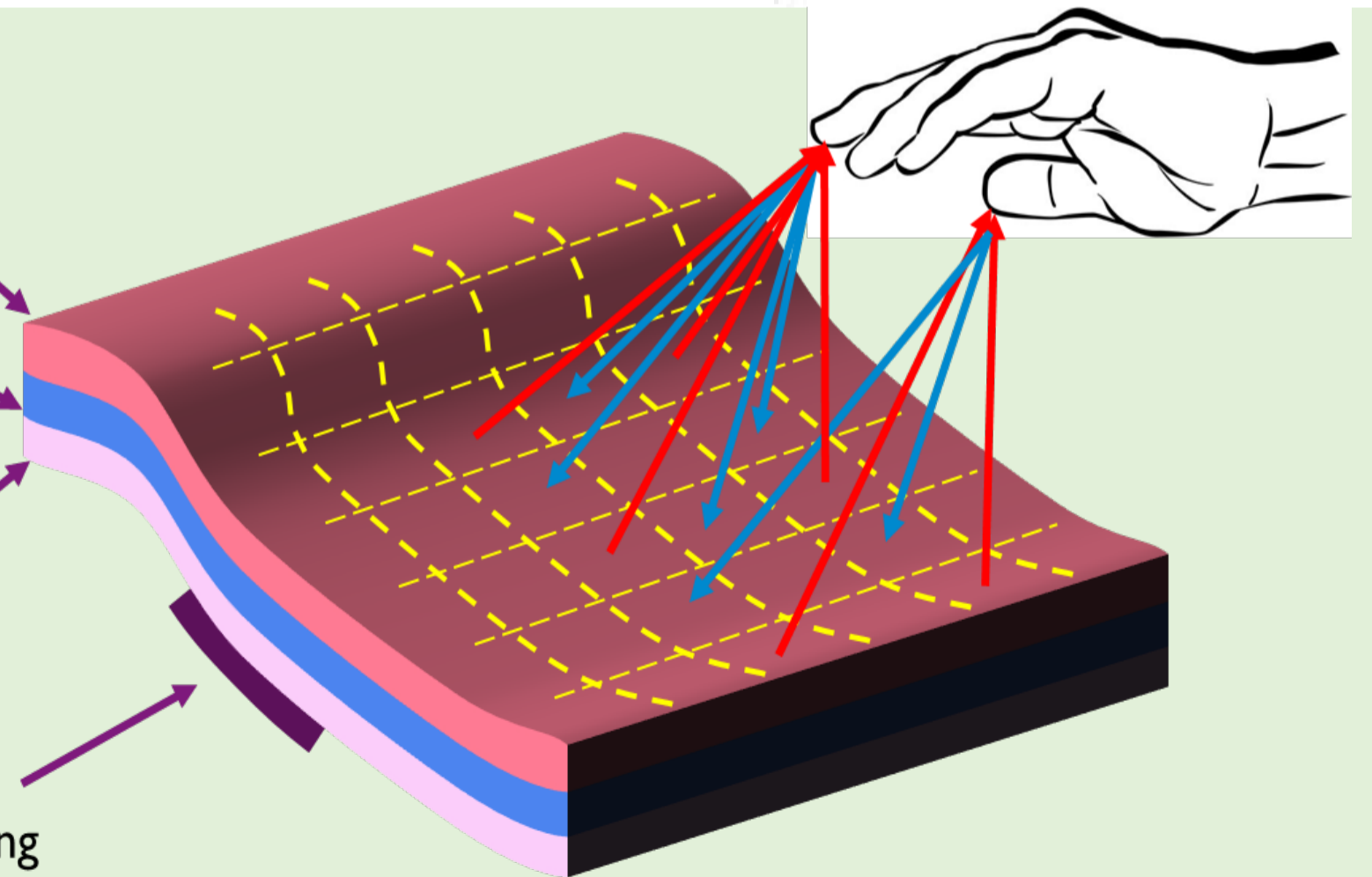cat, dog
bat, dolphin

Transducer layer

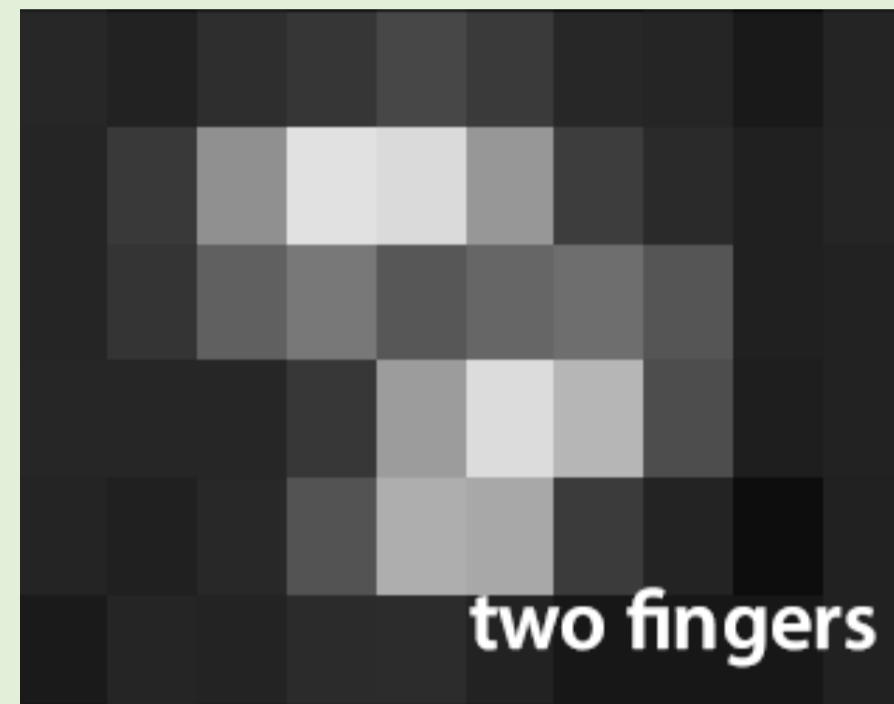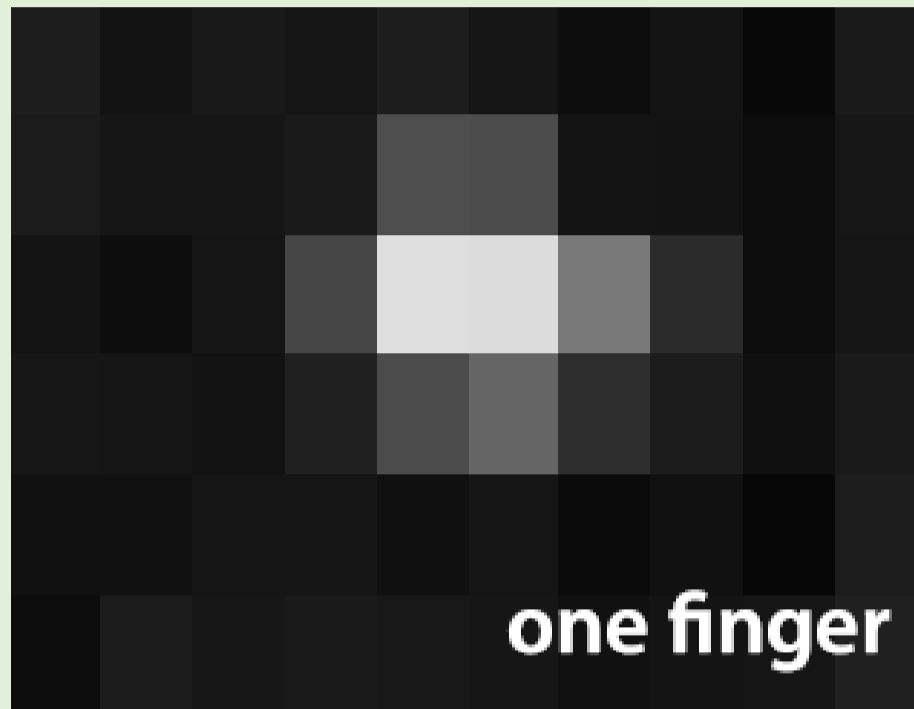Integrated drive and readout support electronics

Routing and redistribution layer

Thinned ASIC for drive, readout and signal processing

(ultra)Sound Interfaces and Low Energy iNtegrated SEnsors

(ultra)Sound Interfaces and Low Energy iNtegrated SEnsors

IMA involvement

Gesture extension for identification and access control, people movement monitoring, high secure access management.

- • Smart motion sensor detects deviation of the **elderly motion profile**. Jeopardy of fall or long lasting immobility is recognized by service SW and application sends alert to relatives.

- • Maintenance staff approaches the **gate of the highly secured spaces**, when he's getting closer to the door his **pace is recognized** by the smart access control system
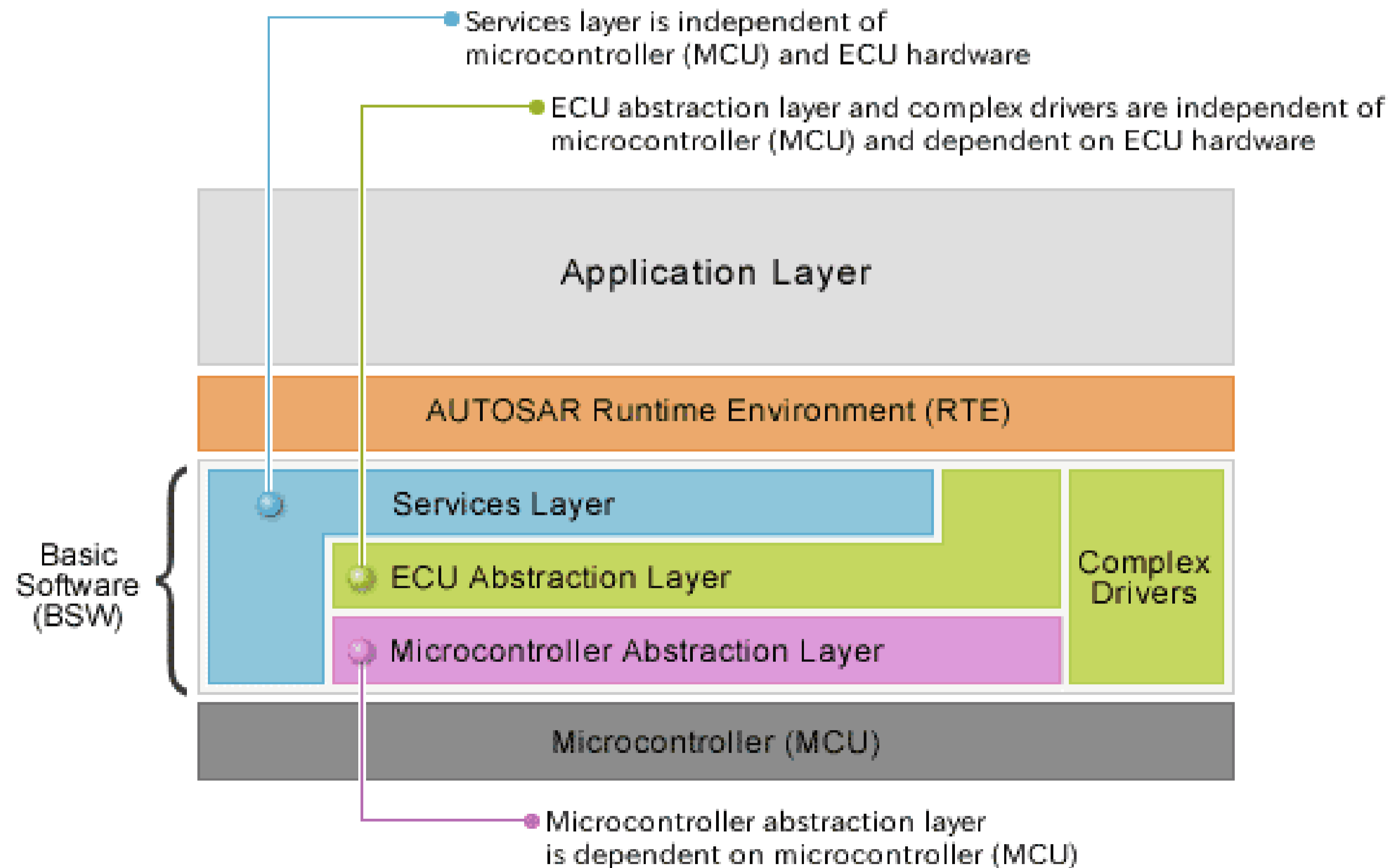
WICC Long term strategy

Exploitation of IMA eID skills and R&D incubator

- Decrease WICC R&D costs thanks to synergies and subsidies

Active involvement in European micro/nano ecosystem is a must to supervise capture and deploy novelties

Boost WITTE roadmap for WICC roll out in terms of R&D required and related staff recruiting

Recognized challenges

《C Deployment of IMA NFC related skills

《C Software Design Platforms

《C New sensors / actuators technologies

《C Strategy for participation on research projects
(Eureka, ECSEL, H2020…)

Closing example

Software Design Platforms

Services layer is independent of microcontroller (MCU) and ECU hardware

ECU abstraction layer and complex drivers are independent of microcontroller (MCU) and dependent on ECU hardware

Application Layer

AUTOSAR Runtime Environment (RTE)

Basic Software (BSW)

Services Layer

ECU Abstraction Layer

Microcontroller Abstraction Layer

Complex Drivers

Microcontroller (MCU)

Microcontroller abstraction layer is dependent on microcontroller (MCU)

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