“Europe will not be made all at once, or according to a single plan. It will be built through concrete achievements which first create a de facto solidarity.”
Robert Schuman

THE KDT JOINT UNDERTAKING. THE EUROPEAN PROGRAMME FOR RD&I IN ELECTRONIC COMPONENTS AND SYSTEMS.

INTERNATIONAL WORKSHOP ON EDGE ARTIFICIAL INTELLIGENCE FOR INDUSTRIAL APPLICATIONS (EAI4IA), VIENNA, AUSTRIA, 25-26 JULY 2022

KDT JU
KEY DIGITAL TECHNOLOGIES JOINT UNDERTAKING

Yves GIGASE
Head of Programmes
08 July 2022

EUROPEAN PARTNERSHIP

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A tutorial for the next generation of policy-makers and decision-takers.

KDT JU
KEY DIGITAL TECHNOLOGIES JOINT UNDERTAKING

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EUROPEAN PARTNERSHIP

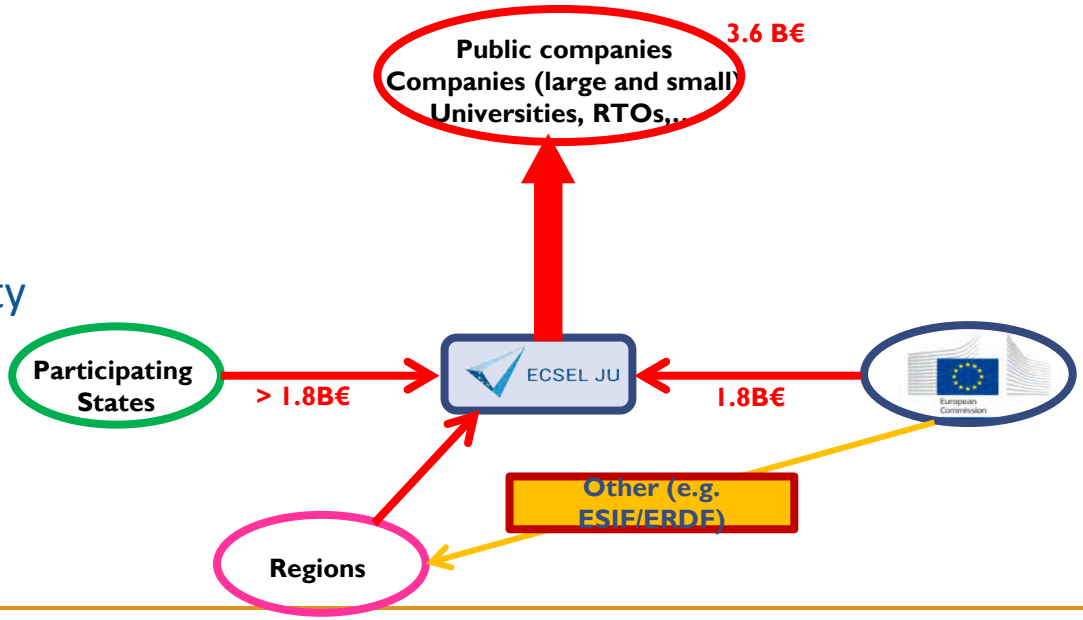
TAKEAWAY

- Programmes such as KDT are huge endeavours, lots of money, lots of work, lots of results, etc.
- But are build by people and you are part of this!
- You can influence such programme, you should influence this, it is your future!
- Invest some of your time in understanding what the Europe Union and programmes such as KDT are about.

ECSEL ARE
PEOPLE, ORGANIZATIONS AND PROJECTS
BUT ALSO
PUBLIC AUTHORITIES
ASSOCIATIONS
EVENTS

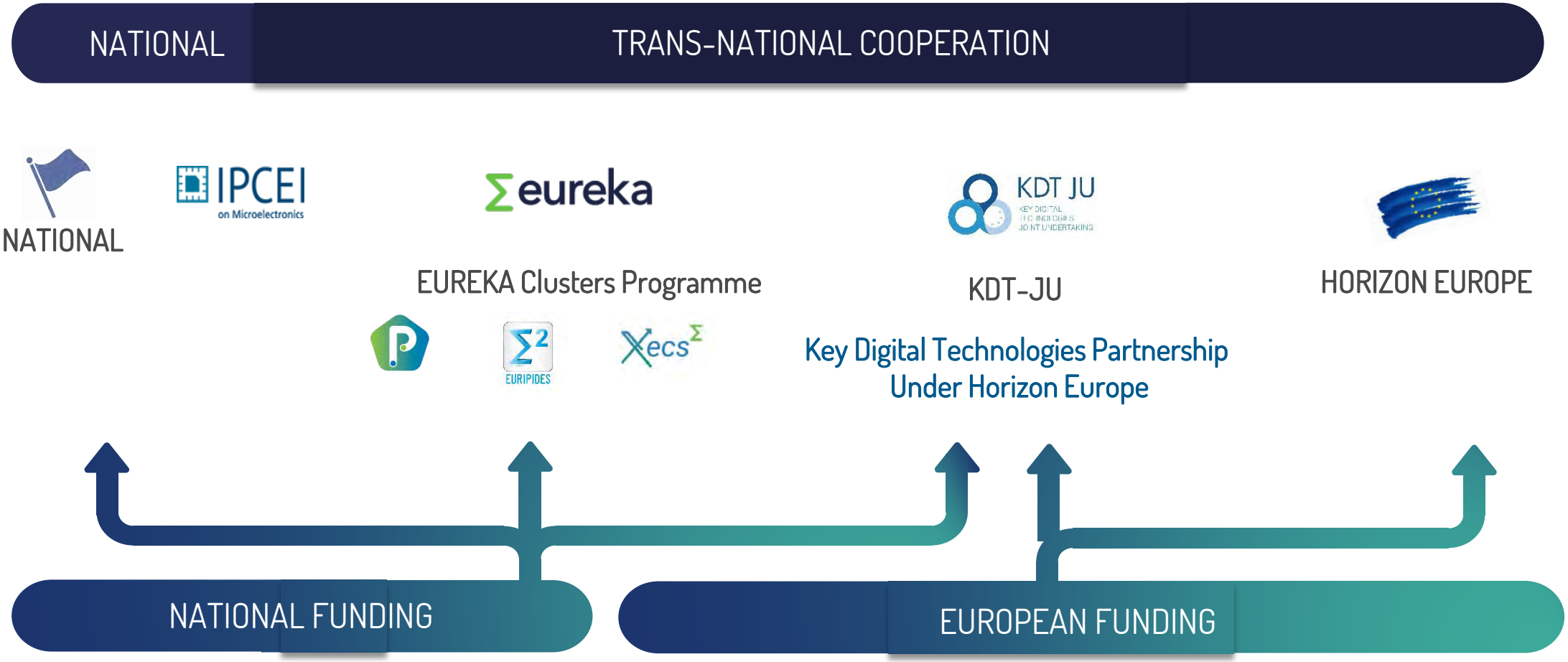
KDT JU 2021-2027

- Third generation JU (start 30/11/2021), predecessor was ECSEL JU
- KDT JU = Key Digital Technology Joint Undertaking
- Tripartite: Commission - Participating states – Industry associations
- Associations: AENEAS, INSIDE, EPoSS
- Budget ambition : 7.2B€ funded by 1,8 B€ (EU)+1,8 B€ (national)
- Based on Horizon Europe
- **Bottom-up** programme with **top-down** focus topics
- "**Value chain**" approach
- **Pilot lines** (higher TRLs)
- **Critical mass** approach
- focussed on **Industrial leadership**
- **Common agenda** of Europe's ECS community



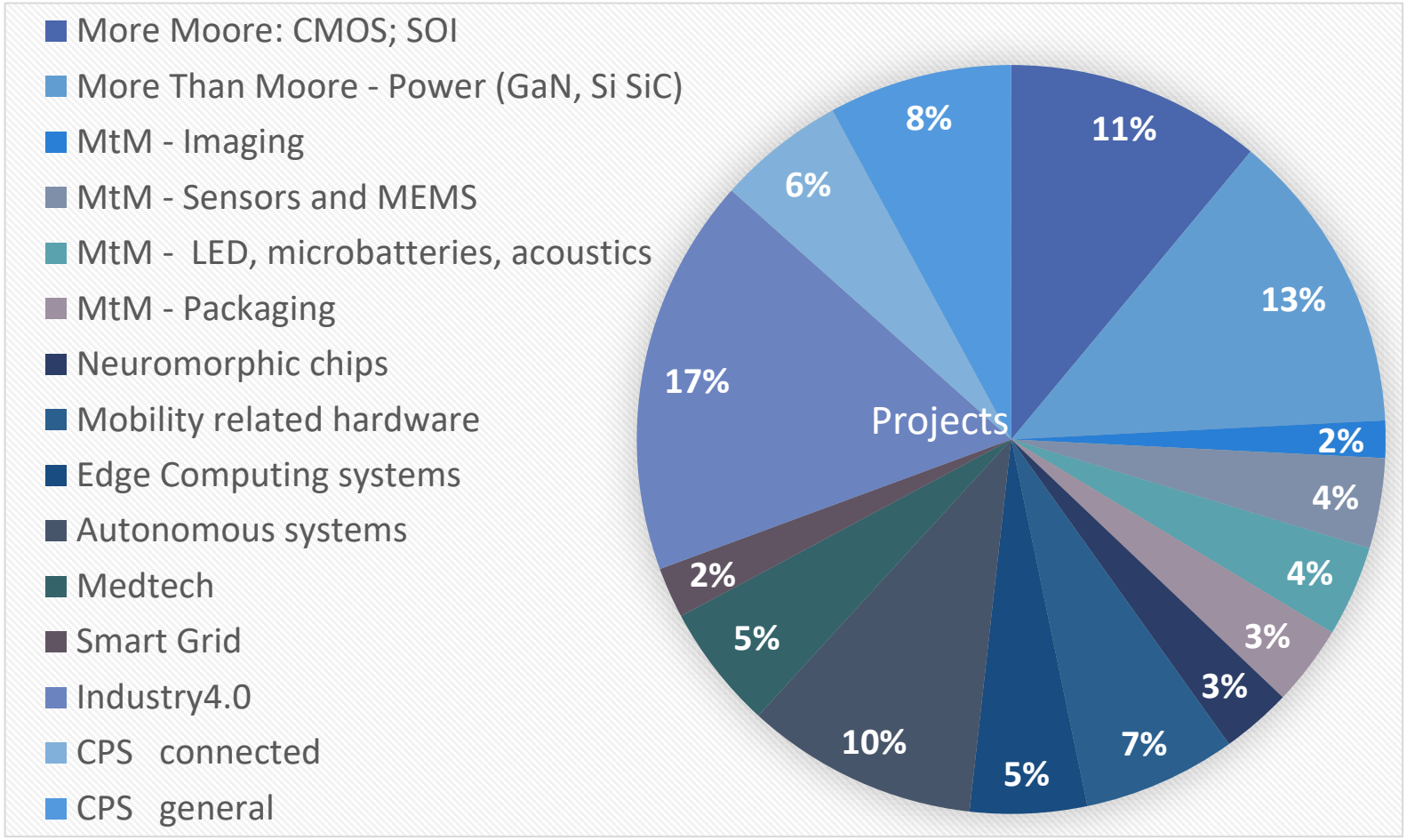
https://www.kdt-ju.europa.eu/

THE EU RD&I FUNDING LANDSCAPE FOR THE ECS INDUSTRY

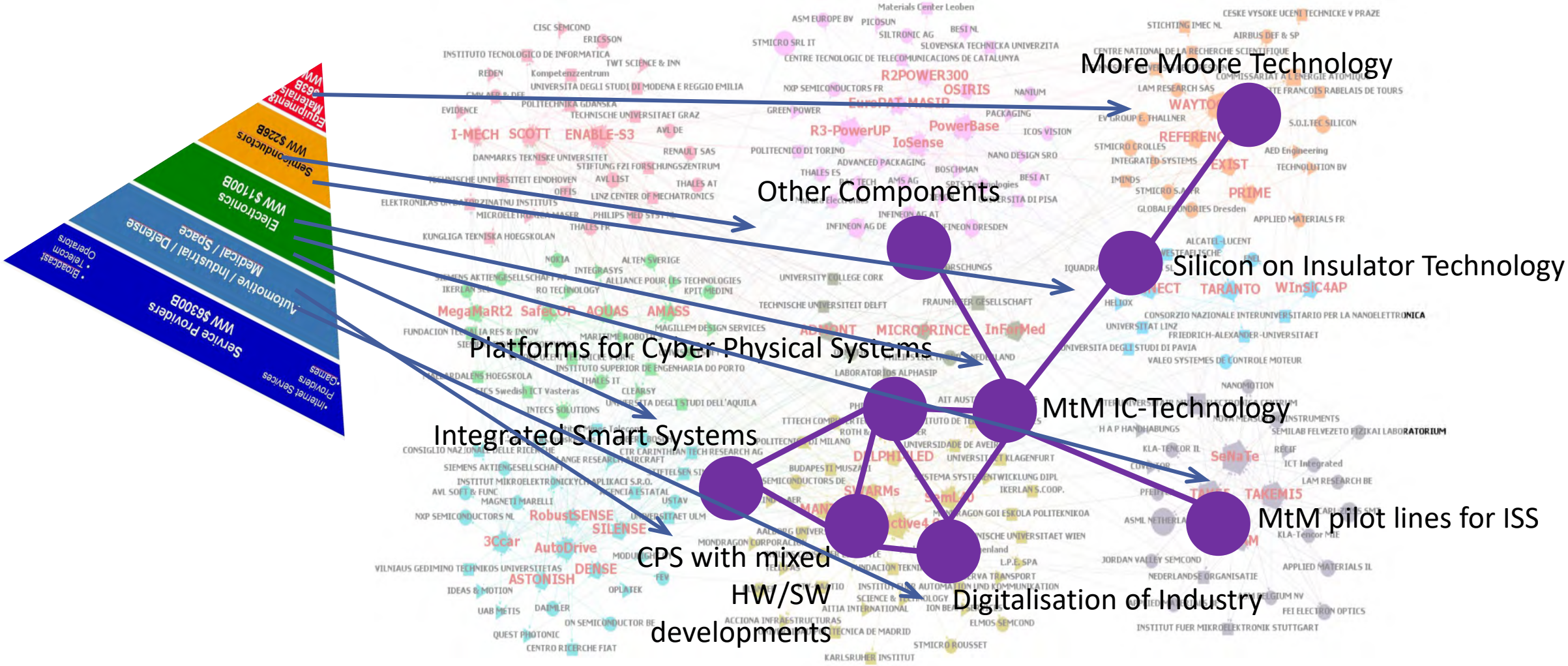


ECSEL JU 2014-2021

- 92 projects
- 3 220 beneficiaries
- 4 690 million Eur in total cost
- 2 280 million Eur in funding (EU+national)
- 408 500 persons-months
- 34 000 person-years
- 29 participating states



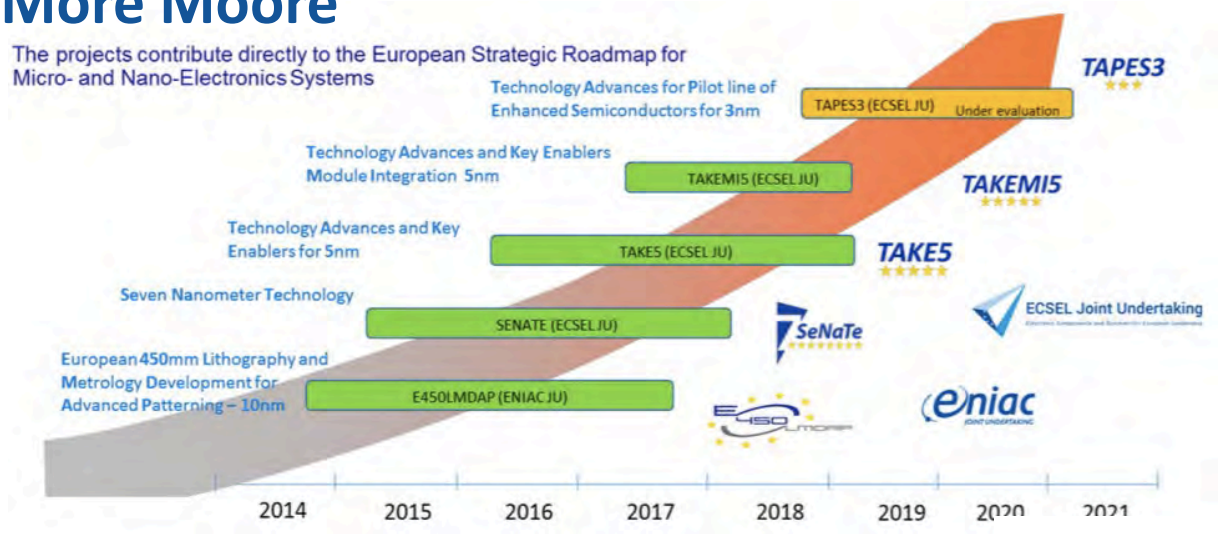
NETWORKS OF PARTNERS AND PROJECTS



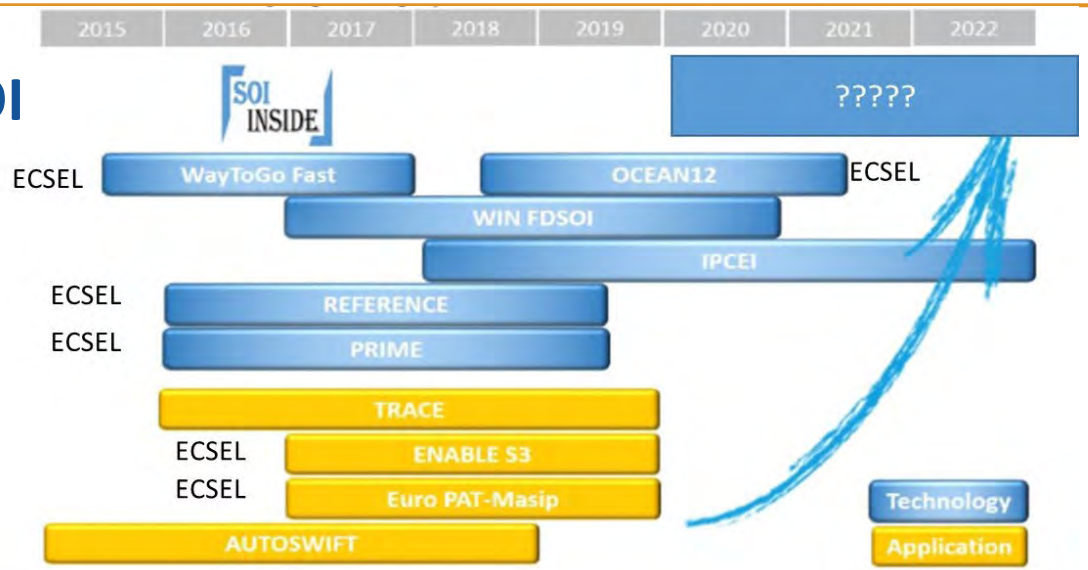
EXAMPLES OF ECSEL PROJECTS.

PILOT LINE PROJECTS AND PROJECT SUITES

More Moore



SOI



Power components

Power Semiconductor and Electronics Manufacturing 4.0 smart, security, variation, simulation

excellence in speed and reliability for More than Moore technologies : high volume production and quick introduction.

"Enhanced Power Pilot Line": 2nd generation power semiconductor devices on 300mm wafer

"Enabling Power technologies on 300mm Wafers" project was based on the concept of a 1:1 transfer approach from 200 mm to 300 mm diameter silicon wafers.

from ASML

5G GaN2

TELECOM

MATQu

Q-COMPUTING

MATQu

Materials for Quantum Computing

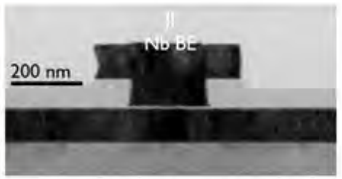
CONTACT SIGN IN

ABOUT MATQU PARTNERS NEWS & MEDIA

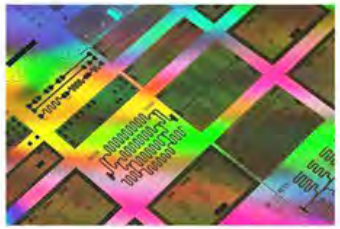
About MATQu

CMOS-based digital computing has given rise to ever-greater computational performance, big-data based business models and the accelerating digital transformation of modern economies. However, the increasingly larger amounts of data to be handled and the continuously growing complexity of today's tasks for high performance computing (HPC) are becoming unmanageable, as data handling and energy consumption of high-performance computers, server farms and cloud services are reaching unsustainable levels. New concepts and technologies for high-performance computing (HPC) are necessary.

One such HPC technology is Quantum Computing (QC). QC utilizes "quantum bits" (qubits) to perform complex calculations fundamentally much faster than conventional digital-bit computing can.. First demonstrators and quantum computer prototypes have been created using various types of quantum bits. Superconducting Josephson junctions (SJJs) have been shown to be extremely promising qubit candidates to achieve a significant, nonlinear increase of computational power with the number of qubits in a quantum computer. Industrial market-introduction of novel materials, devices, and characterization represents a great challenge yet opportunity for Europe to create a complete value chain for Josephson junction technology and QCs. Such a complete value chain will be a significant contribution to Europe's technology sovereignty



Josephson junction TEM cross-section (© IMEC)

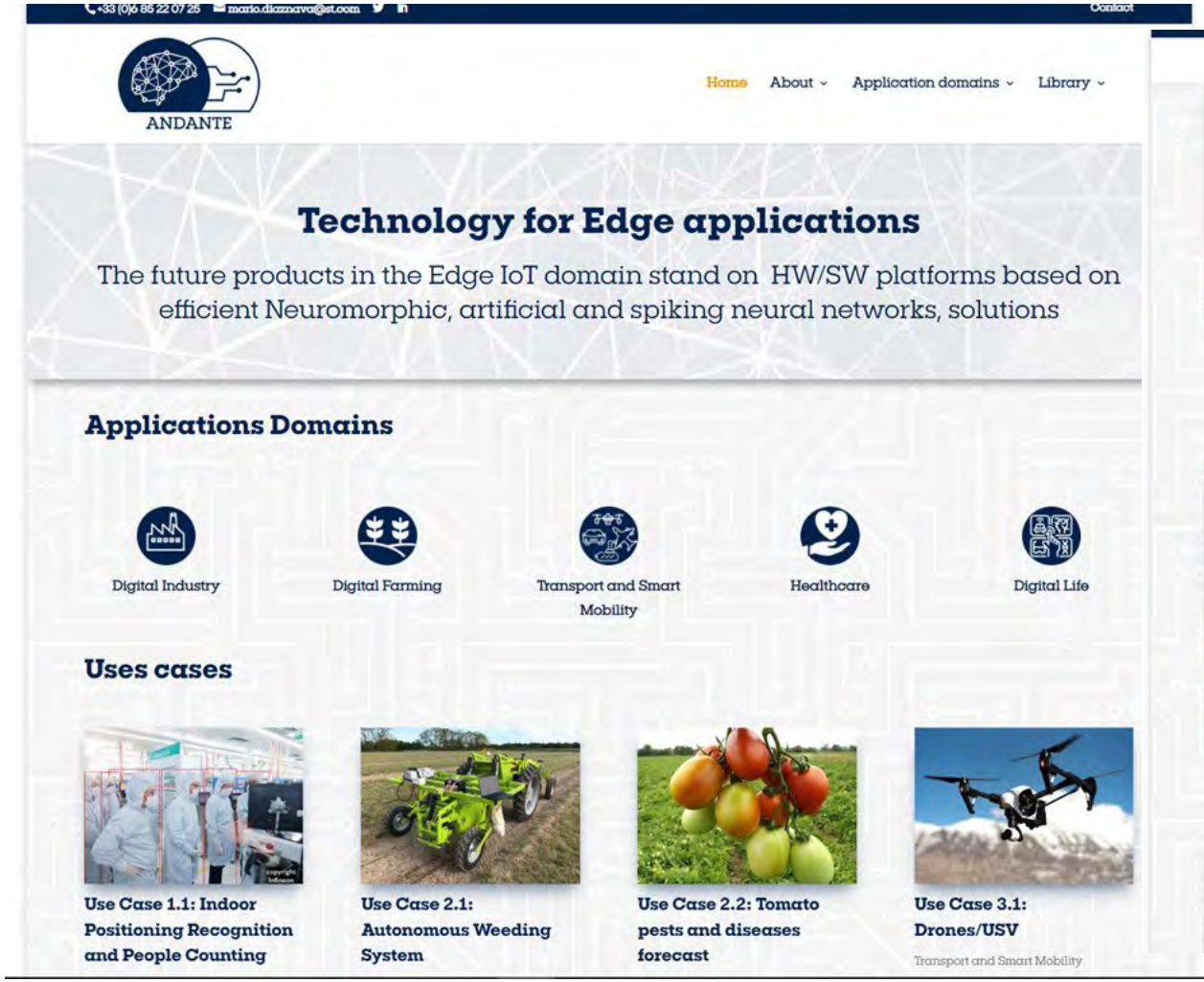


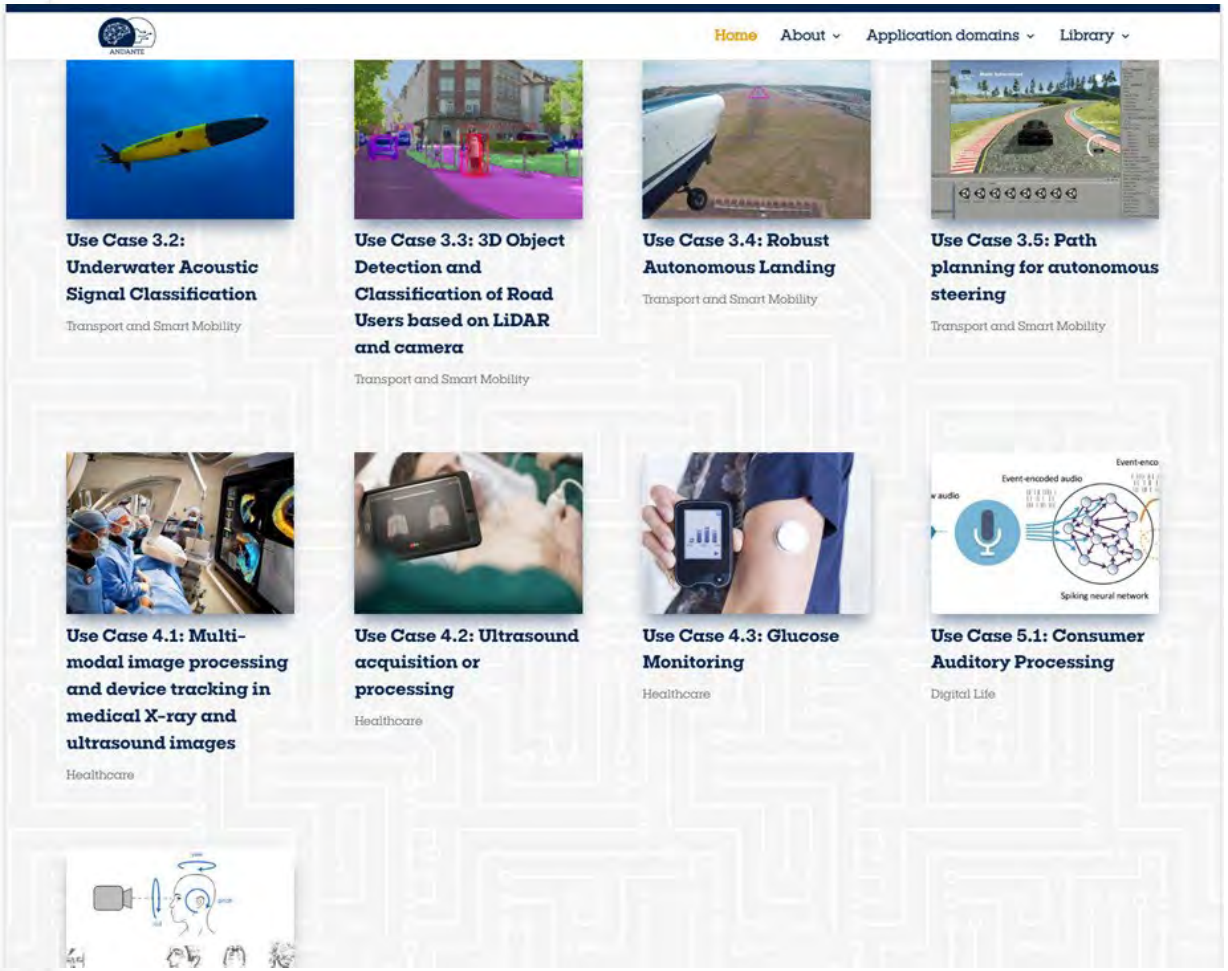
Testchip with superconducting qubits in a 300 mm integrated process prototype (© IMEC)

The MATQu project will validate technology options to produce SJJs on industrial 300 mm silicon-based process flows. The project addresses substrate technology, superconducting metals, resonator technology, through-wafer-via holes, 3D integration, and variability characterization. The substrate-, process- and test-compatibility will be assessed with respect to integration practices for qubits. Core substrate and process technologies with high quality factors, improved material deposition on large substrates, and increased critical temperature for superconducting operation, will be developed and validated.

ANDANTE

EDGE AI





HiEFFICIENT

MOBILITY

HiEFFICIENT

OBJECTIVES USE CASES STAKEHOLDERS NEWS PUBLICATIONS CONTACT

HiEFFICIENT

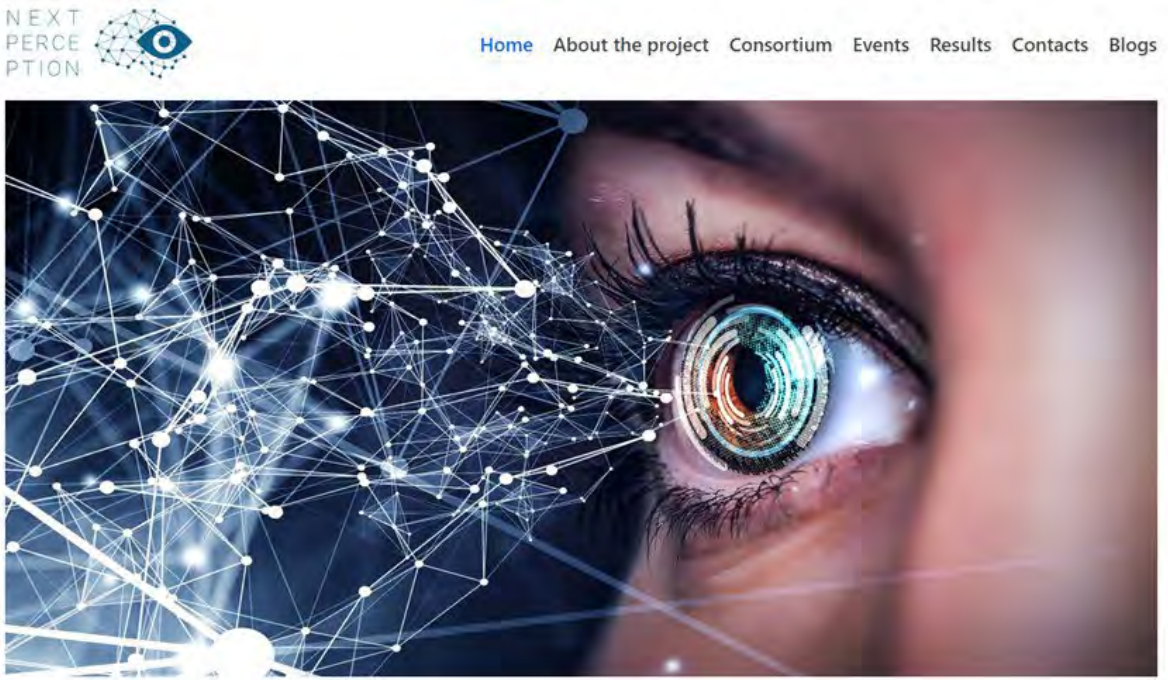
HiEFFICIENT stands for
Highly EFFICIENT and reliable electric drivetrains based on modular, intelligent and highly integrated wide bandgap power electronics modules.

ADVANCED WBG ELECTRONICS FOR AUTOMOTIVE INDUSTRY

HiEFFICIENT project makes a substantial contribution to the European Commission's "The European Green Deal" initiative, by ensuring **sustainable mobility** and **resource efficiency** for future transportation. Therefore, **highly reliable and integrated wide-bandgap (WBG) technologies** in electronic power circuits and systems of electrified vehicles and charging infrastructures shall be developed in the course of the project.

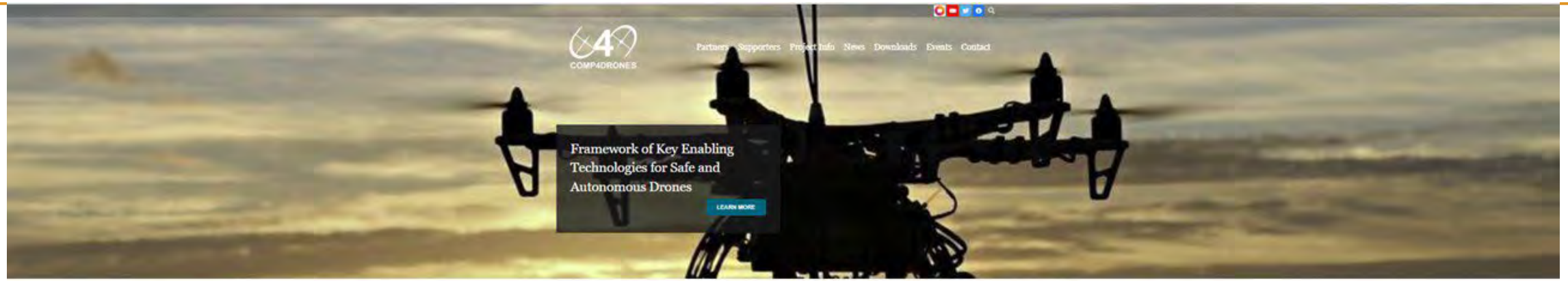
NEXTPERCEPTION

MOBILITY



COMP4DRONES

DRONES



WHAT IS COMP4DRONES?

COMP4DRONES is an ECSEL JU project coordinated by Inria that brings together a consortium of 40 partners with the aim of providing a framework of key enabling technologies for safe and autonomous drones. It brings to bear a holistically designed ecosystem from application to electronic components, realized as a tightly integrated multi-vendor and compositional UAV embedded architecture solution and a tool chain complimenting the compositional architecture principles. The project will mainly focus on the following objectives:

- Ease **the integration and customization** of embedded drone systems
- Enable drones to take **safe autonomous decisions**
- Ensure the deployment of **trusted communications**
- Minimize the **design and verification effort** for complex drone applications
- Ensuring **sustainable impact** and creation of an industry-driven community

Demonstration and validation activities are essential to ensure the quality and relevance of innovations. COMP4DRONES will ease the development of new application and functionalities on the fields of transport, construction, surveillance and inspection, logistics, and agriculture.

Use Cases

Transport

Drones for optimization of transport control, operation and infrastructure management

Construction

Drones for virtual design, construction and operation of transport infrastructures

Logistics

Logistic using heterogeneous drones fleet

Surveillance and Inspection

Drone and wheeled robotic systems for inspection, surveillance and rescue operations

Agriculture

Smart and Precision Agriculture: From Vines to rows

SWARMs

DRONES

SWARMs)))

Smart and Networking Underwater Robots in Cooperation Meshes

HOMEPAGE | OVERVIEW | APPROACH | USE CASES | CONSORTIUM | NEWS | PUBLICATIONS | USEFUL LINKS | CONTACT US

The primary goal of the SWARMs project is to expand the use of underwater and surface vehicles (AUVs, ROVs, USVs) to facilitate the conception, planning and execution of maritime and offshore operations and missions. This will reduce the operational costs, increase the safety of tasks and of involved individuals, and expand the offshore sector.

SWARMs project aims to make AUVs, ROVs and USVs further accessible and useful, making autonomous maritime and offshore operations a viable option for new and existent industries:

- Enabling AUVs/ROVs to work in a cooperative mesh thus opening up new applications and ensuring re-usability by promoting heterogeneous standard vehicles that can combine their capabilities, in detriment of further costly specialised vehicles.
- Increasing the autonomy of AUVs/USVs and improving the usability of ROVs for the execution of simple and complex tasks, contributing to mission operations' sophistication.

The general approach is to design and develop an integrated platform for a new generation of autonomous maritime and underwater operations, as a set of software/hardware components, adopted and incorporated into the current generation of maritime and underwater vehicles in order to improve autonomy, robustness, cost-effectiveness, and reliability of offshore operations, namely through vehicles cooperation.

SWARMs' achievements will be demonstrated in three field testing sites and occasions, taking into account different scenarios and use cases:

- Corrosion prevention in offshore installations
- Monitoring of chemical pollution

NEWS (more news here)

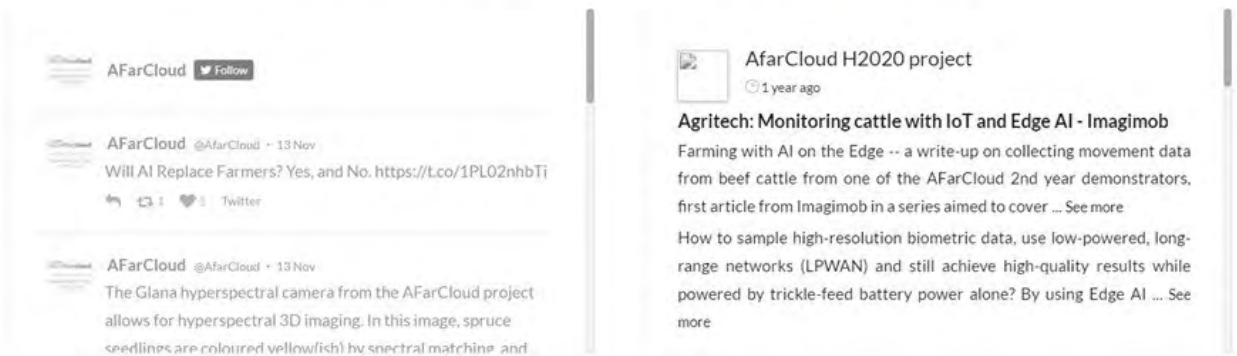
SWARMs)))
www.swarms.eu

The SWARMs project (video)
2015 - 2018

SWARMs 2nd (final) set of demonstrations (video)

AFARCLOUD

AGRICULTURE



CONNECT

ENERGY

CONNECT

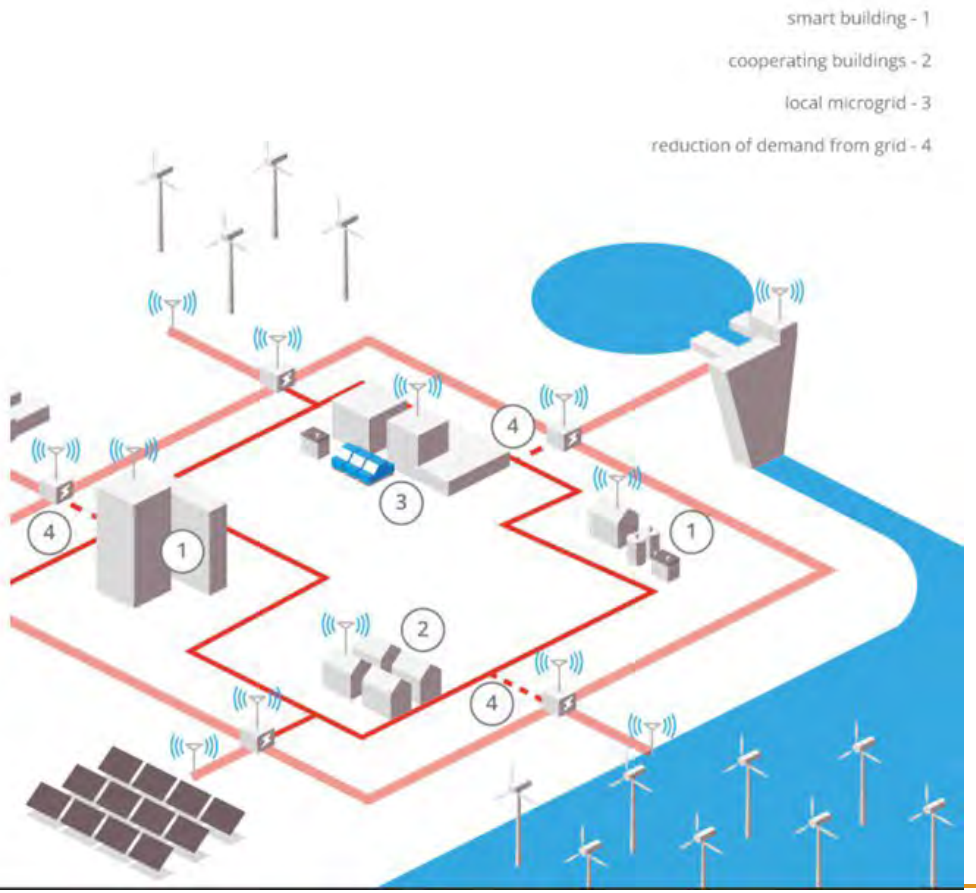
Home Project Consortium Deliverables News Publications Contact

Find out more on

CONNECT

Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid.

CONNECT aims to provide concepts, technologies and components that support enhanced integration of renewables and storage combined with intelligent management of the energy flow and thus allows to reduce the demand for primary energy, to reduce carbon dioxide emissions and facilitates a decentralized energy infrastructure.



PROGRESSUS

ENERGY

PROGRESSUS

HOME NEWS PROJECT CONSORTIUM PUBLICATIONS CONTACT

Highly Efficient and Trustworthy Electronics, Components and Systems for the Next Generation Energy Supply Infrastructure

Next Generation Smart Grid to reduce Greenhouse Gas Emissions and Grid Peak Power

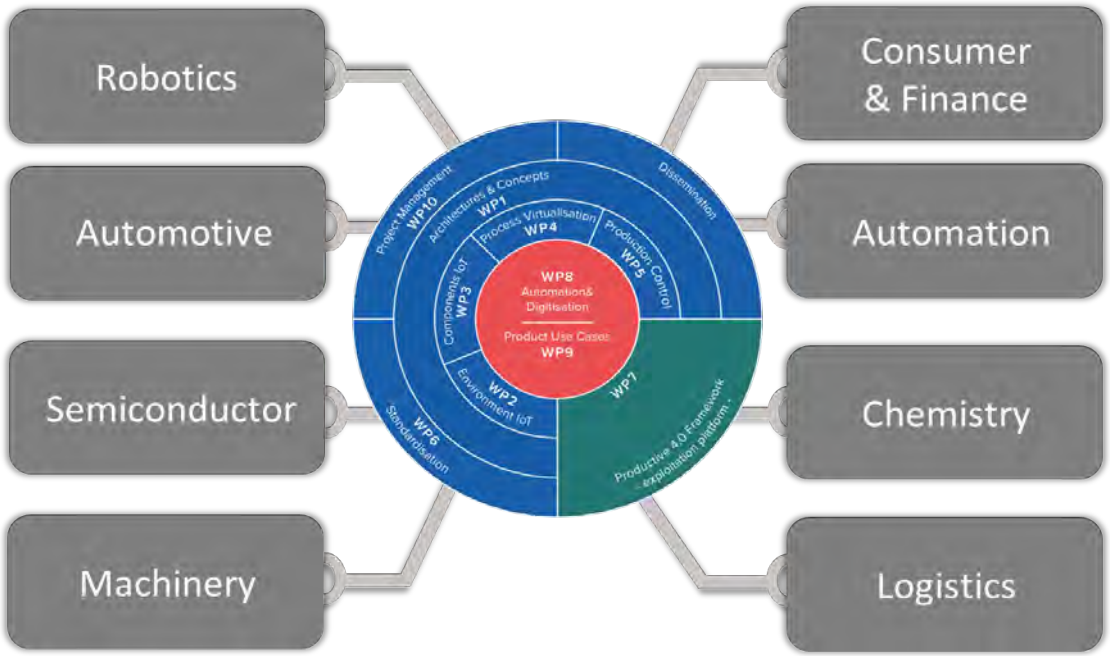
The high-power requirements of ultra-fast charging stations give rise to special challenges when designing smart charging infrastructure. In support of Europe's 2030 climate targets, the EU-funded PROGRESSUS project aims to introduce a next-generation smart grid demonstrated by the application example of a smart charging infrastructure integrating seamlessly into current smart-grid architecture concepts. To do so, it will research new efficient high-power converters that support bidirectional power flow. New DC microgrid management strategies for energy efficiency and service provision that consider renewable energy sources, storage and flexible loads will be investigated. It will also explore novel sensor types, inexpensive high-bandwidth communication technologies and security measures based on hardware security modules and blockchain technology to protect communication and services. The project's solution will promote a more environmentally friendly and efficient next-generation energy supply infrastructure.

PRODUCTIVE 4.0

Productive 4.0

INDUSTRY 4.0

Significant improvement in digitalizing the European industry by means of electronics and ICT.
- aiming at suitability for everyday application
- various industrial domains with same approach of digitalization.



ELECTRONICS AND ICT AS ENABLER FOR DIGITAL INDUSTRY AND OPTIMIZED SUPPLY CHAIN MANAGEMENT COVERING THE ENTIRE PRODUCT LIFECYCLE

2016,
115 partners,
105MEuro cost

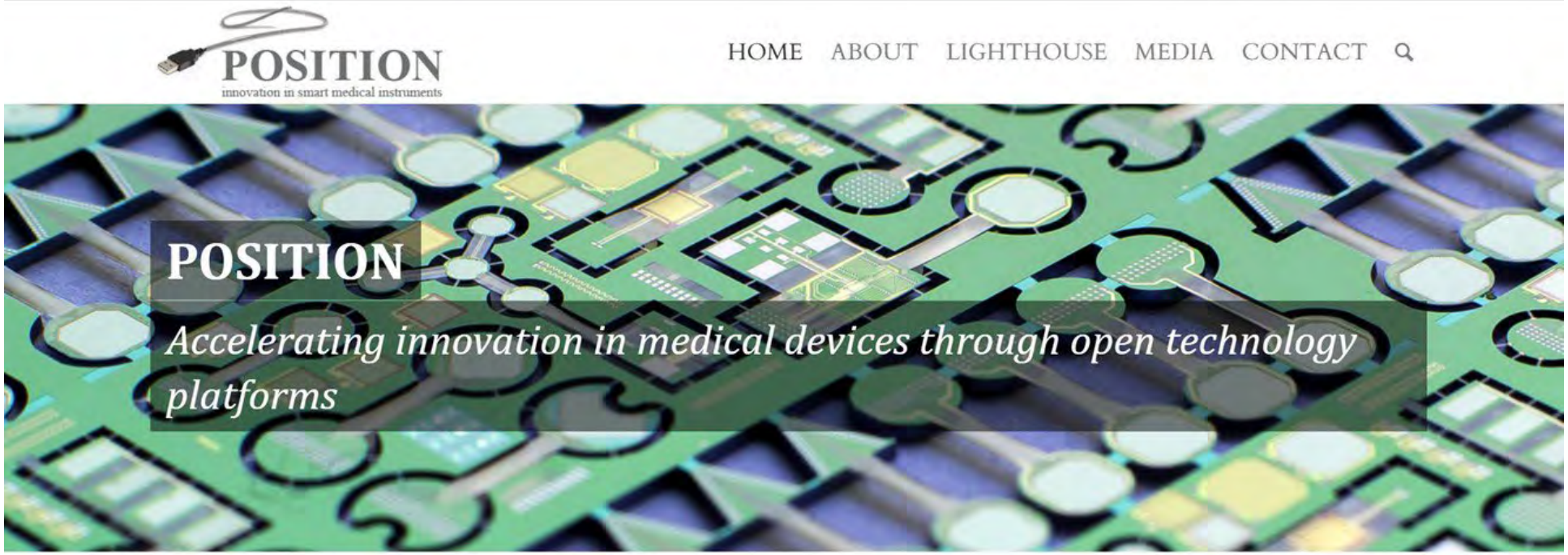
Key partners: BMW, Philips, Infineon, ABB, NXP, STM, BOSCH, Thales, AVL, VOLVO, CEA, BetterSolutions, IMA, KIT, AIT, FhG, Sysgo, DANOBAT, MONDRAGON, ERICSSON, VTT, SINTEF, LTU, LFOUNDRY ,TNO, TTTech, Siltronic, VIF and many more..

ARROWHEAD TOOLS

INDUSTRY 4.0

POSITION II

MEDTECH



Towards

THE NEXT GENERATION SMART CATHETERS AND IMPLANTS

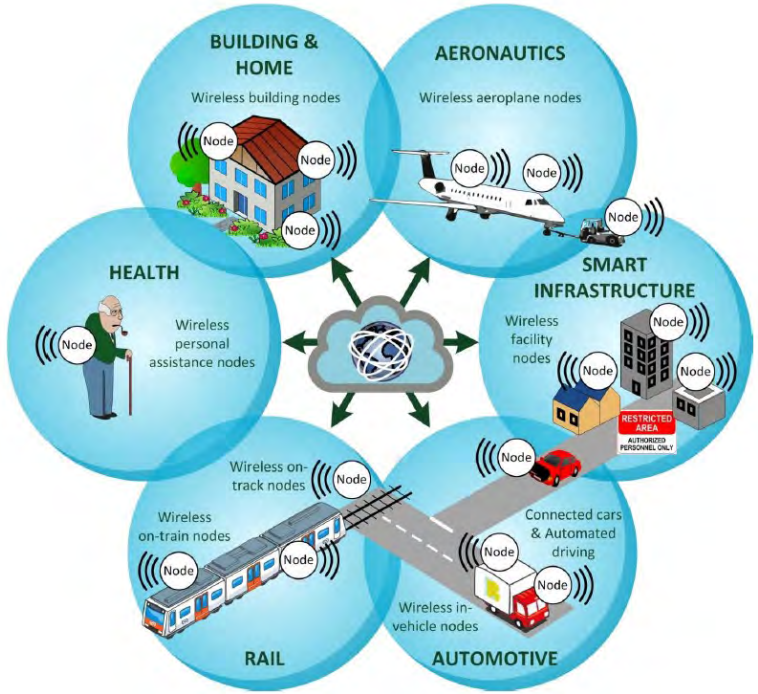
*It is the ambition of **POSITION** project to enable innovation in **Smart Catheters** and **Implants** by the introduction of **open technology platforms** for: miniaturization, in-tip AD conversion, wireless communication, MEMS transducer technology and encapsulation. These platforms are **open to multiple users and for multiple applications.***

SCOTT

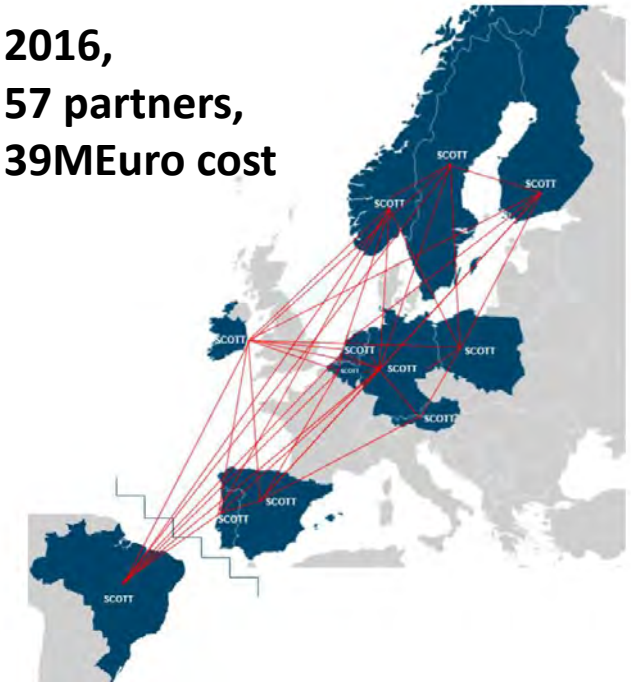
Secure COnnected Trustable Things

One of the objectives: Evaluate compatibility and interoperability with other reference standards and architectures, validating the global applicability of SCOTT reference architecture (HLA). (incl.5G)

CYBERSECURTIY



2016,
57 partners,
39MEuro cost



8 GOOD REASONS TO PARTICIPATE IN ECSEL PROJECTS

1. **Critical mass**
2. **Value chain projects:** including value chain partners is the motorway to accelerate co-innovation and market adoption
3. Building **trust**
4. Creating project pipelines for **long-term continuity**
5. Pushing new products/technologies in **new markets**, starting new companies
6. Exploitation of **synergies** across application and technology domains
7. Support working across competition, benchmarking technologies and **sharing innovation risk**
8. Allow the **education** of engineers/scientists in new technologies.

FOR KDT ADD:

1. Participate to projects that **make a difference** to the planet and humanity
2. Leverage your participation through **cooperation across programmes**

THE PROGRAMME OF KDT
DO YOU NEED A NEW STRATEGY?

HORIZON EUROPE

Accelerate the twin green and digital transitions and associated transformation of our economy, industry and society.

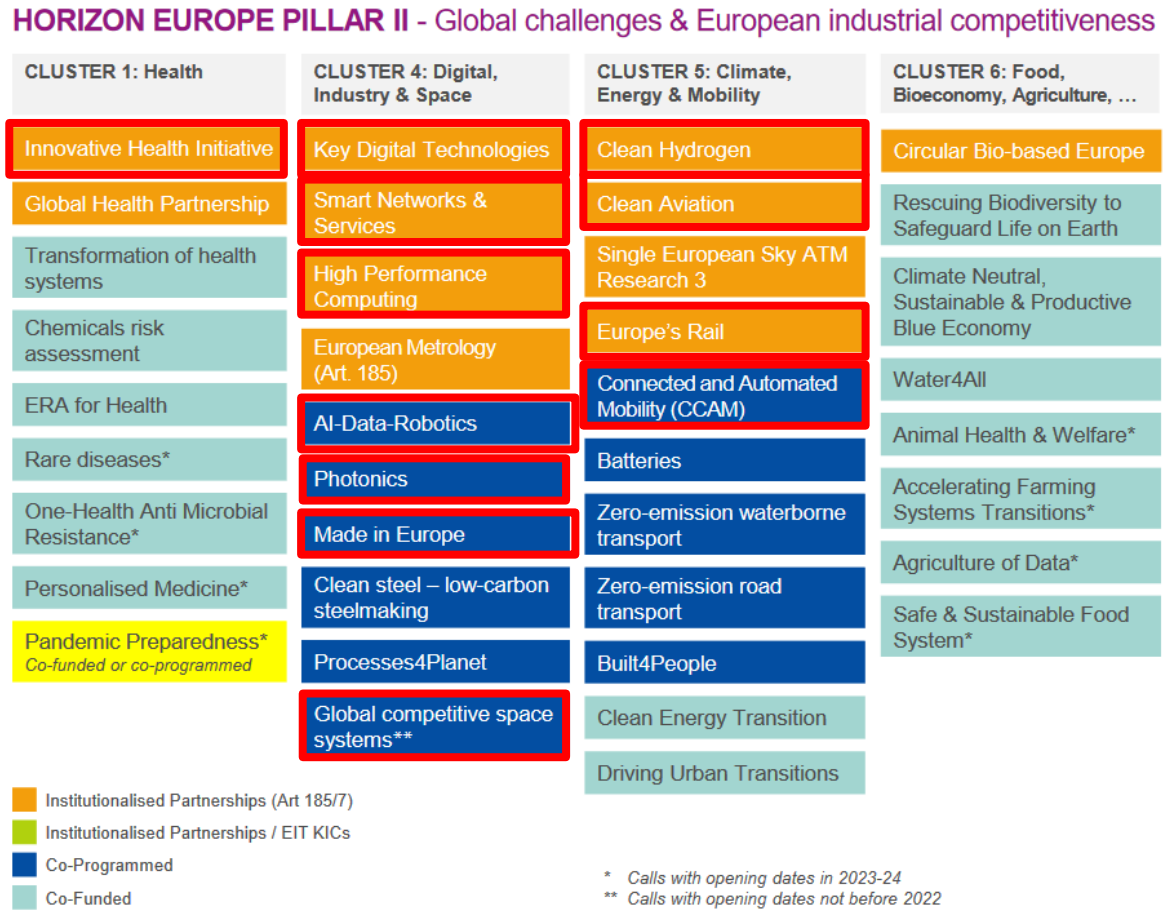
Special attention will be given to ensuring vibrant cooperation between **universities, scientific communities and industry, small and medium enterprises**.

COOPERATION ASPECTS

Potential for synergies through cooperative actions are multiple :

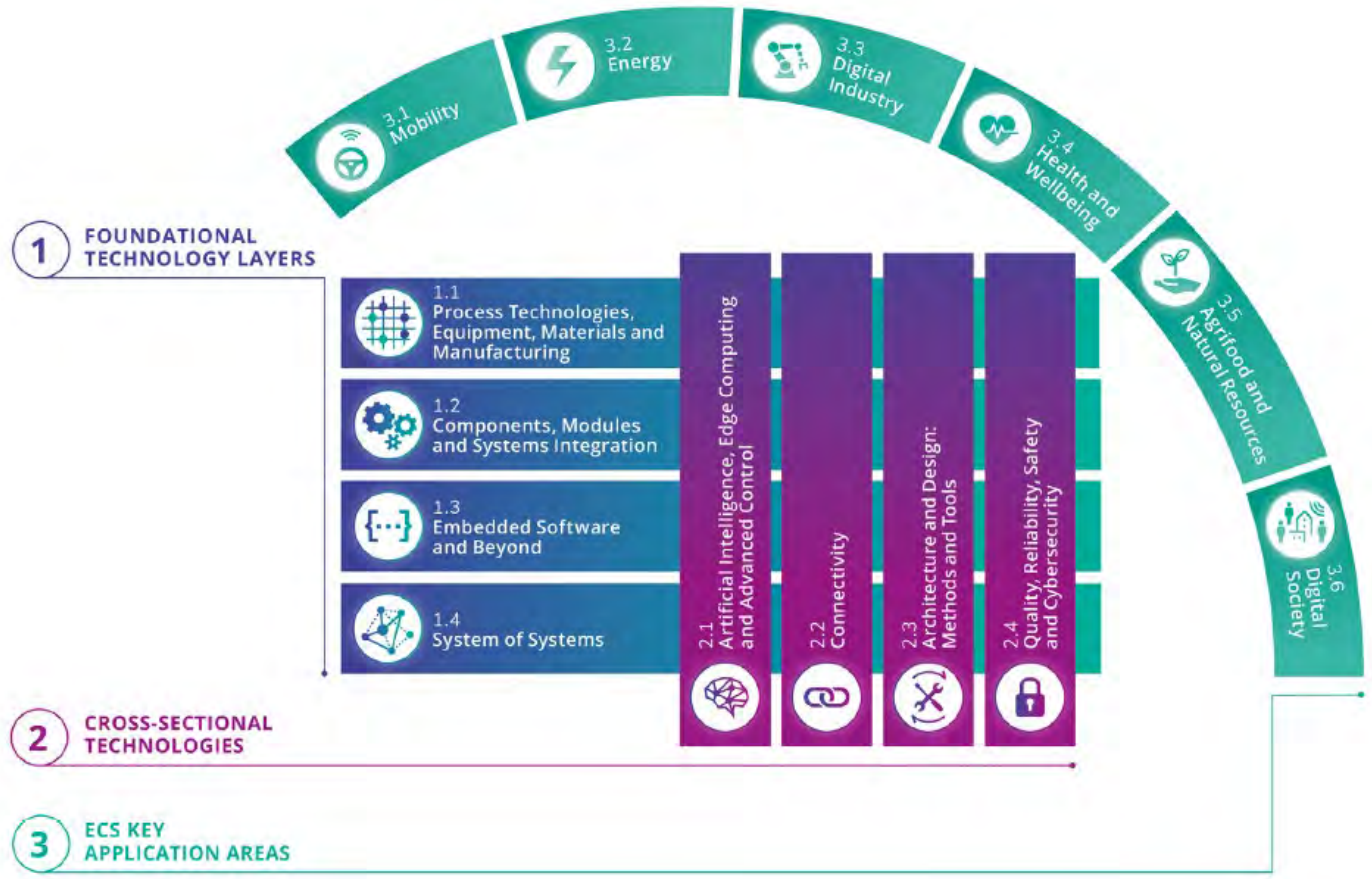
- Smart Networks & Services: initiative on 5G and 6G connectivity
- European High Performance Computing: initiative on underlying supercomputing capacities
- Photonics, AI, data, robotics, Global competitive space system and Made in Europe: synergies are needed where EU industry has to develop leadership and competitiveness in the global digital economy.
- Digital Europe Programmes with testing facilities, skills development and capacity building activities in specific digital domains, similar for Connecting Europe Programmes
- Health, Mobility and Energy partnerships
- IPCEI, other national programmes
- Eureka clusters
- Coordination with regional clusters such as Silicon Europe, Silicon Saxony (Dresden), Minalogic (Grenoble), and DSP Valley (Leuven-Eindhoven)

European Partnerships



ECS SRIA

- Boost **industrial competitiveness** through **interdisciplinary** technology innovations.
- Ensure/reinforce **EU strategic autonomy** through secure, safe and reliable ECS supporting key European application domains.
- Establish and strengthen sustainable and resilient ECS value chains supporting the **Green Deal**.
- Unleash the full potential of intelligent and autonomous ECS-based systems for the **European digital era**.



BOTTOM UP VERSUS TOP DOWN - EU VERSUS NATIONAL SYNERGIES

Focus topics

Other European partnerships and missions, Particpating States, 3A,

PAB at selection

Selection taking into account national synergies

Portfolio of projects

SRIA as basis for WP, consortia building, support by associations, topic selection

GB, WP, at or before launch

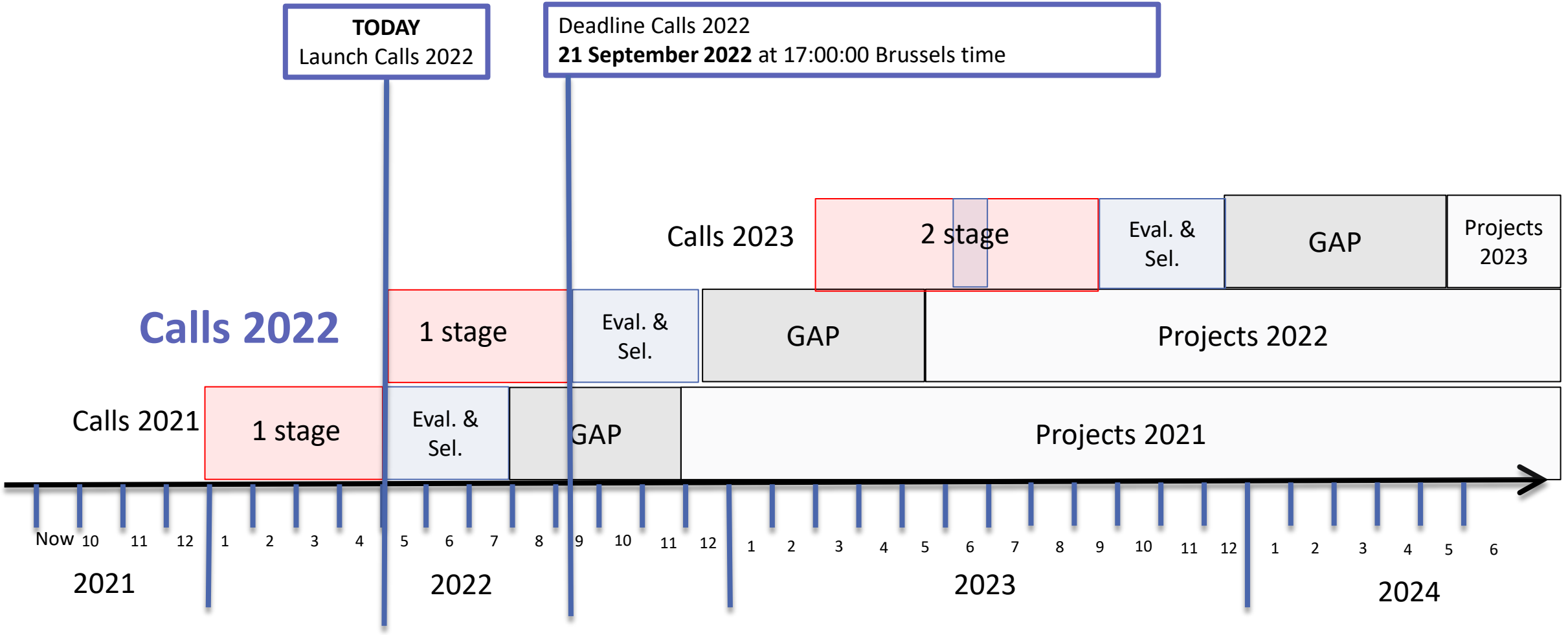
Proposals submitted by the community in regular calls for all open topics

STRATEGY FOR THE EDGE-AI COMMUNITY

- Edge-AI pluses and minuses
  - The topic is there to stay
  - The community needs to grow
- Define clear and simple objectives
  - Ask the right questions, put the right focus, no time to loose
- Use that to improve and detail roadmaps
  - Be ambitious, create impact
- Reach out to other PPPs and other communities
  - Design community (chips act)
  - 6G community (SNS JU)
- Align your RM with RMs of the other PPPs/communities
- Help define focus topics and submit proposals!

How do I participate?

KDT CALL PLANNING



https://www.kdt-ju.europa.eu/current-call

EU Estimated Expenditure for the Calls 2021-1 to 2021-3

Action		EU funding (M€)
Call 2021-1 IA	General according to SRIA 2021	108.0 M€
Call 2021-1-IA-Focus Topic	Development of open-source RISC-V building blocks	20.0 M€
Call 2021-2 RIA	General according to SRIA 2021	50.0 M€
Call 2021-2-RIA-Focus Topic 1	Processing solutions for AI at the edge addressing the design stack and middleware	20.0 M€
Call 2021-3-CSA	A Pan-European chip infrastructure for design innovation	10.0 M€
	Total	208.0 M€

Action	Topic	EU funding (M€)
Call 2022-1 T1	Topic 1 General according to SRIA 2022 (IA)	120.0
Call 2022-1 T2	Topic 2: Focus topic on Industrial supply chain for silicon photonics (IA)	20.0
Call 2022-1 T3	Topic 3: Focus topic on Design of Customisable and Domain Specific Open-source RISC-V Processors (IA)	20.0
Call 2022-2 T1	Topic 1: General according to SRIA 2022 (RIA)	74.5
Call 2022-2 T2	Ttopic 2: Focus topic on Ecodesigned smart electronic systems supporting the Green Deal objectives (RIA)	20.0
	Total	254.5 M€

How to Participate?

Three industry organisations:
AENEAS
INSIDE Industry Association
EpoSS

https://aeneas-office.org/collaboration/ecs-tool/
https://www.inside-association.eu/
https://www.smart-systems-integration.org/

ECS Collaboration Tool

A networking tool for project ideas and potential partners.

Inside and AENEAS have now merged their collaboration support tools into a single co-managed service: the ECS Collaboration Tool. AENEAS and Inside Industry Association wanted to create one tool to facilitate easy information exchange within the ECS community and allow the collection and management of all relevant data, ideas and project proposals in one place.

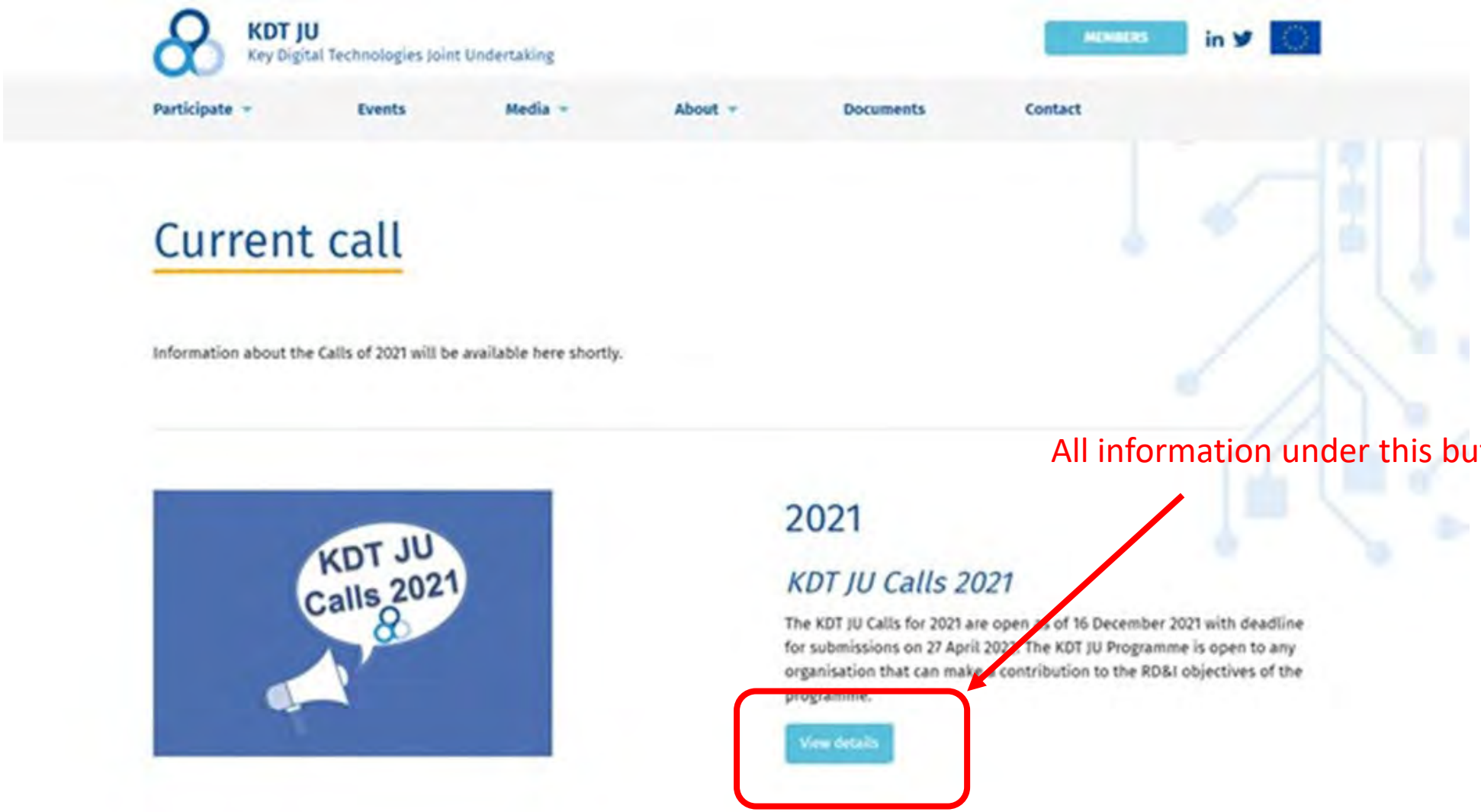
Create a project idea

Initiate a project idea in the ECS Collaboration Tool, invite partners and browse other project ideas.

Look for a partner

Use the partner search on ECS Collaboration Tool to look for possible partners based on their expertise and invite them to join your project idea.

How to start? Go to KDT Call webpage!



What is next?

A NEW DEVELOPMENT: EUROPEAN CHIPS ACT

European Commission

English EN

Search

Home > Press corner > Digital sovereignty: Commission proposes Chips Act

Available languages: English

Press release | 8 February 2022 | Brussels

Digital sovereignty: Commission proposes Chips Act to confront semiconductor shortages and strengthen Europe's technological leadership

Page contents

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- Related media
- Press contact

Today, the Commission proposes a comprehensive set of measures to ensure the EU's security of supply, resilience and technological leadership in semiconductor technologies and applications. The European Chips Act will bolster Europe's competitiveness, resilience and help achieve both the digital and green transition.

https://ec.europa.eu/commission/presscorner/detail/en/ip_22_729

The context: we are in a crisis…

1 Severe shortage of semiconductor chips

In a context of…

- Accelerated digital transition
- Increased demand for semiconductors
- Concentration of production in Asia (Taiwan, Korea)

2 Security supply risk in the EU

Due to…

- Limited capabilities in manufacturing
- Insufficient expertise in manuf. at < 20 nm
- High entry fees / cost for new facilities
- Geopolitical tensions (e.g. South China Sea)

3 Detrimental effect across industries

Leading-edge semiconductor technology is central to…

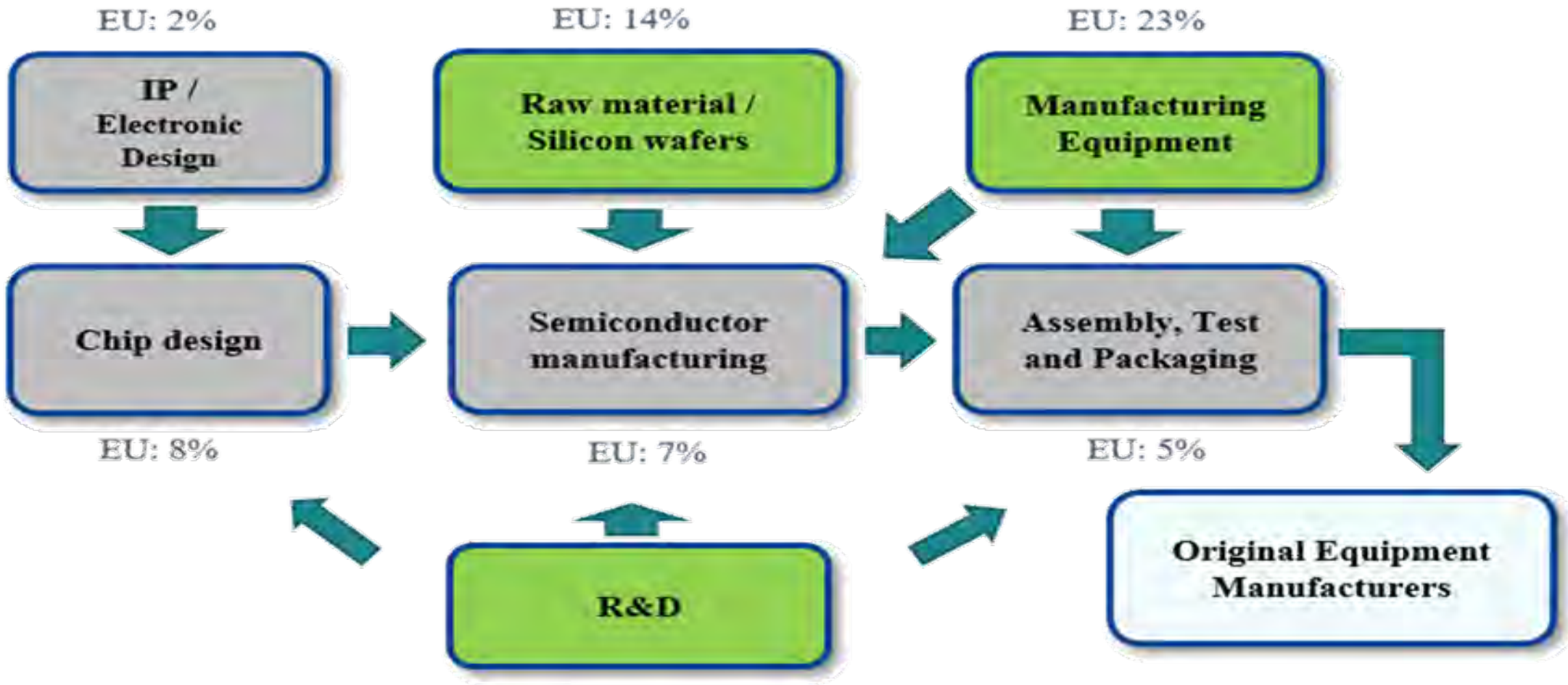
- Competiveness
- Security, safety and data protection
- Energetic performance of digital systems

*No single Member State can face these problems alone, need for:

- **EU & international partnerships**
- **Public subsidies**

Minus 11 million cars produced globally and 23% drop in German car sales in 2021.

SEMICONDUCTORS VALUE CHAIN IN EUROPE



The European Chips Act

3 Pillars

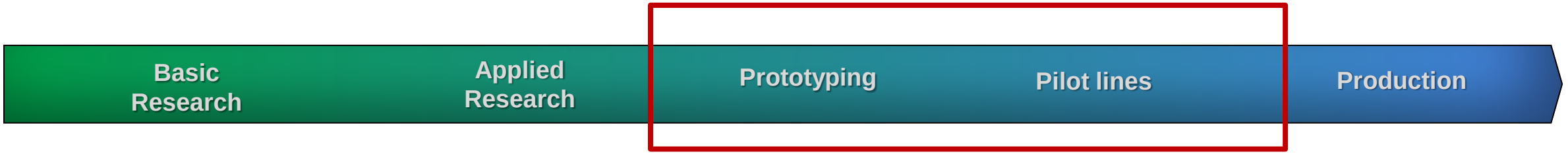
Chips for Europe Initiative: pool resources from EU, MS and other, as well as the private sector, through: the "**Chips Joint Undertaking**"	**New framework to ensure security of supply** by: A. Attracting **investments** and enhanced **production capacities**. B. **Chips Fund to facilitate access to finance** for start-ups to help them mature their innovations and attract investors. C. D**edicated semiconductor equity investment facility** under InvestEU to support scale-ups and SMEs to ease their market expansion.	**Coordination mechanism between the Member States and the Commission** for monitoring the supply of semiconductors, estimating demand and anticipating the shortages. • **monitor** the semiconductor value chain • **common crisis assessment** • coordinate **actions to be taken** from a new emergency toolbox • **react swiftly and decisively together**

CHIPS FOR EUROPE INITIATIVE

Bridge the gap ***from lab to fab***

Create ***large innovation capacity*** and ***a resilient and dynamic*** semiconductor ***ecosystem***

- Build up **large-scale design innovative capacities** for integrated semiconductor technologies
- Enhance existing and developing new **pilot lines**
- Build advanced technology and engineering capacities for accelerating the development of **quantum chips**
- Create a network of **competence centres** across Europe
- Establish a **Chips Fund** to facilitate access to loans and equity by start-ups, scale-ups and SMEs and other companies in the semiconductor value chains



- Programmes such as KDT are huge endeavours, lots of money, lots of work, lots of results, etc.
- But are build by people and you are part of this!
- You can influence such programme, you should influence this, it is your future!
- Invest some of your time in understanding what the Europe Union and programmes such as KDT are about.

Thank you!
Questions ?