EARTO POLICY EVENT 2019

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What is today the most important issue for Horizon Europe?

Joint Declaration RTOs-Industry for an Ambitious Horizon Europe

- **€120 billion budget**

- **60% of Horizon Europe's budget to pillar II**

EARTO Recommendations

1. **Scale-up Horizon Europe's overall budget to at least €120bn**

2. **Reinforce Europe's excellent multi-disciplinary, collaborative and applied RD&I by strengthening the budget share of Horizon Europe Pillar II to 60%**

3. **Support the continuity of public-private partnerships**

4. **Create a European strategy on technology infrastructures**

5. **Ensure RTOs' participation in the governance of European Missions**

6. **Implement the EIC instrument to support the creation and scale-up of European deep-tech start-ups**

7. **Continue the efforts undertaken to foster the synergy of funds**

8. **Preserve continuity in the Framework Programme's rules for participation**

   ➢ **Over 30 EARTO position papers on Horizon Europe since 2016**

Jean-Eric Paquet

Director-General,
DG Research & Innovation,
European Commission

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Digital Technology sovereignty

## *Rebuilding the EU digital supply chain*

Role of RTOs

Khalil Rouhana
Deputy Director-General, DG CONNECT
European Commission

- President-elect Ursula von der Leyen political priorities

"ensure that Europe fully grasps the potential of the digital age and strengthens its industry and innovation capacity"

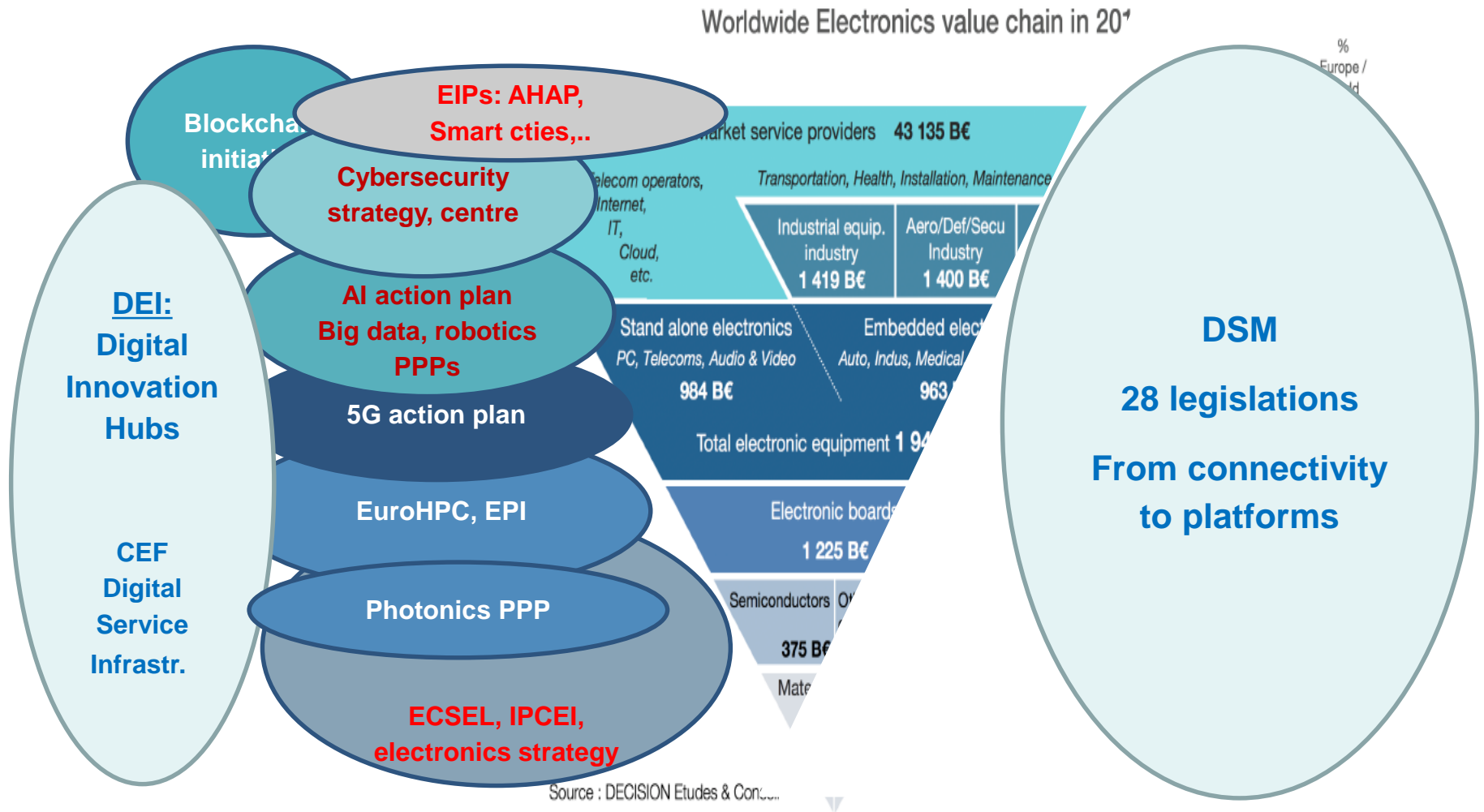as a key part of strengthening Europe's technological leadership and sovereignty.
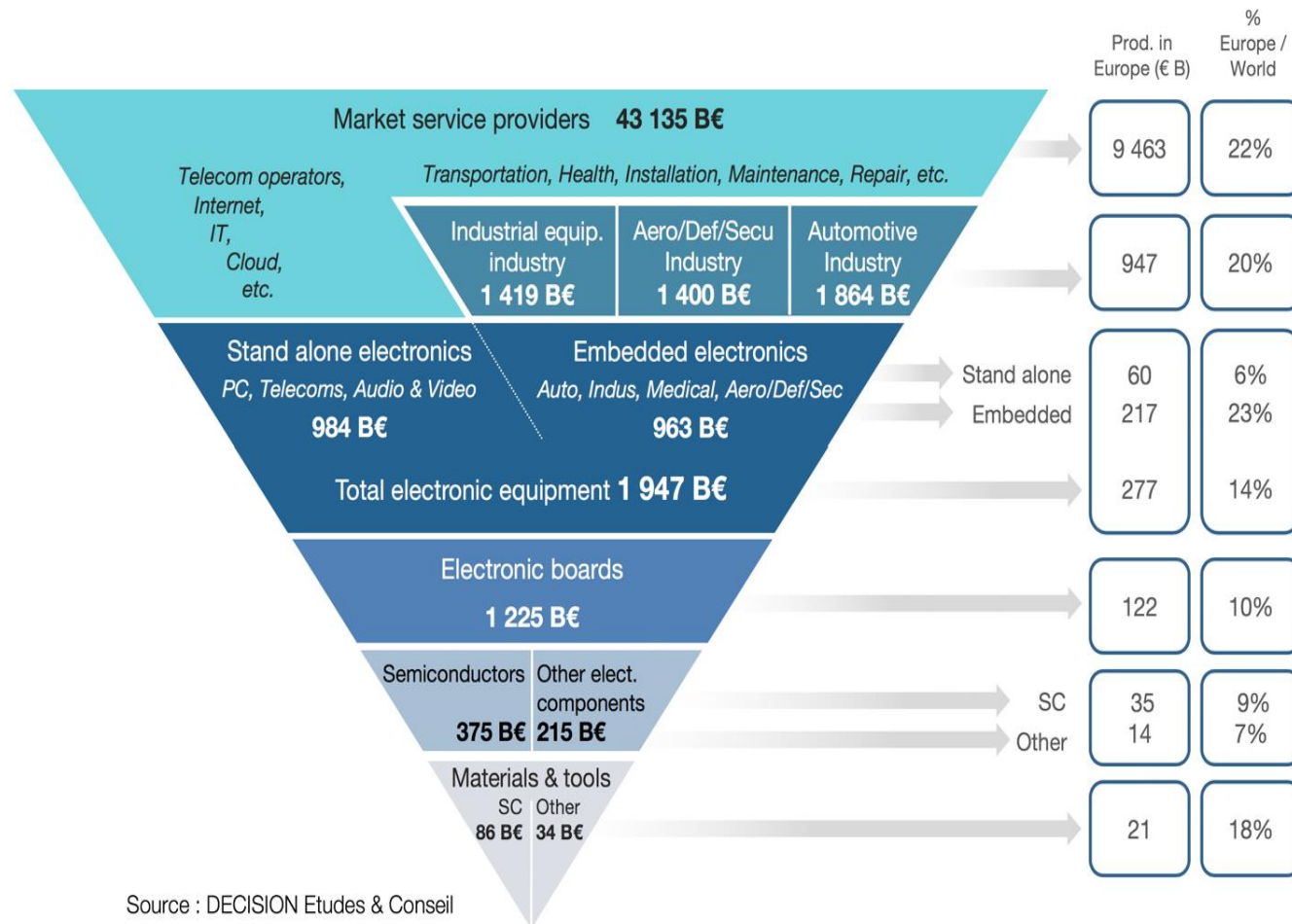
Source : DECISION Etudes & Conseil

Data of 2017

EU approach: A digital single market, world class infrastructure, robust partnerships

Worldwide Electronics value chain in 20⁻

Blockchain initiative

EIPs: AHAP, Smart cties,..

Cybersecurity strategy, centre

AI action plan Big data, robotics PPPs

5G action plan

EuroHPC, EPI

Photonics PPP

ECSEL, IPCEI, electronics strategy

DEI: Digital Innovation Hubs

CEF Digital Service Infrastr.

DSM

28 legislations

From connectivity to platforms

% Europe / World

market service providers   43 135 B€

Transportation, Health, Installation, Maintenance

Telecom operators, Internet, IT, Cloud, etc.

Industrial equip. industry   1 419 B€

Aero/Def/Secu Industry   1 400 B€

Stand alone electronics
PC, Telecoms, Audio & Video   984 B€

Embedded elect
Auto, Indus, Medical   963

Total electronic equipment 1 94

Electronic boards   1 225 B€

Semiconductors   Ot
375 B€

Mate

Source : DECISION Etudes & Cons...

Some major milestones: Industrial/Technology strategy

ELG: Reversing the downward trend
Supply- demand, Softwre/hardware
Build on strengths
Launch ECSEL, innovation hubs
Explore an IPCEI

AI Strategy: Three pillars:
- Excellence, competitiveness
- Legal/ethical
- Skills, society

IPCEI: ~ 8 B€ investments
Production in Europe
Building on ECSEL pilot lines

23 May 2013 | Sept 2013 | June 2014 | Feb 2015 | April 2016 | Sept 2016 | Nov 2016 | April 2018 | Sept 2018 | Dec 2018

European strategy on electronics

Launch of ECSEL

5G Action plan

Digitising industry

Launch of DIH Data Platforms

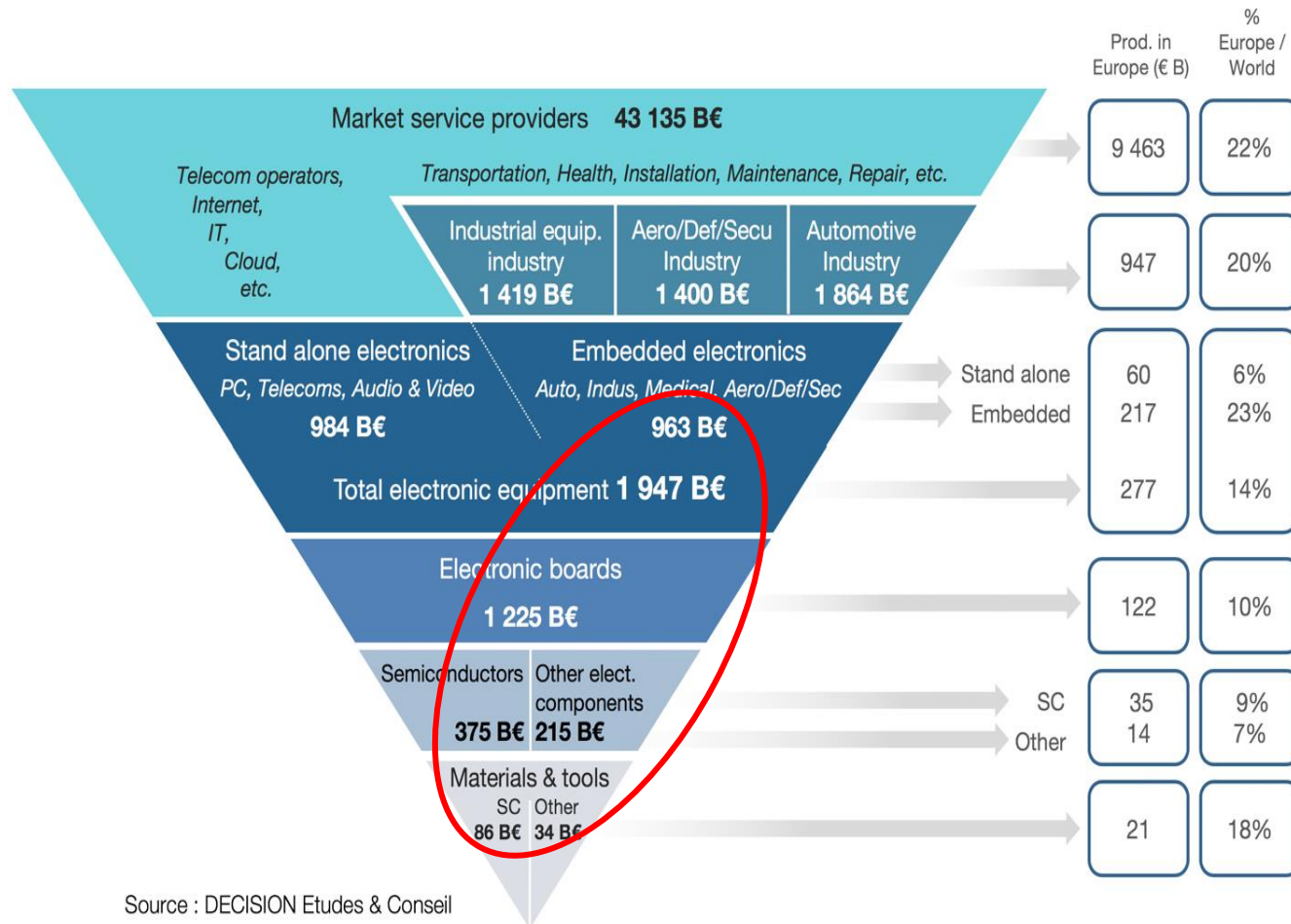**AI strategy**

Launch EuroHPC

IPCEI notified

DEI:
- **Digital Innovation Hubs**
- Partnerships, Platforms,
- Integration, Testing exprimenting
- Close to 5 B€ from EU
- Leveraging close to 50 B€

Euro HPC
- World leadership in HPC
- Rebuilding the computing value chain,
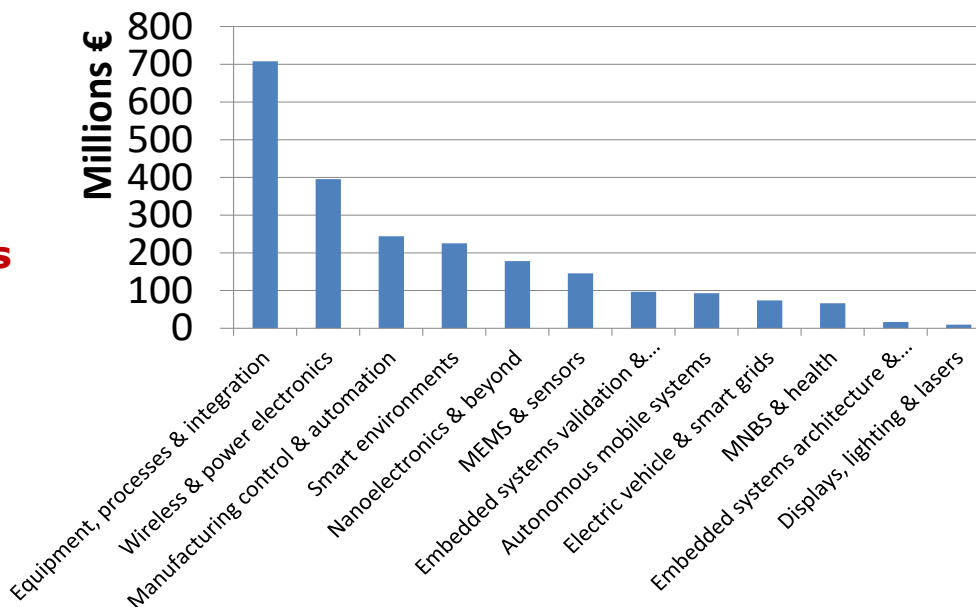- **Processor initiative**

Source : DECISION Etudes & Conseil

Data of 2017

ECSEL: Aligning our strategies, more than 5 B€ investment

- Tripartite PPP – Commission, Member States and industry
- Strategic mission to boost the maturing and uptake of highly innovative technologies for electronic components and systems
- From components to smart systems to CPS
- High leverage effect on EU contribution
- In first three years
  - 39 projects funded for 2.25 B€ of total costs and 540 M€ EU contribution

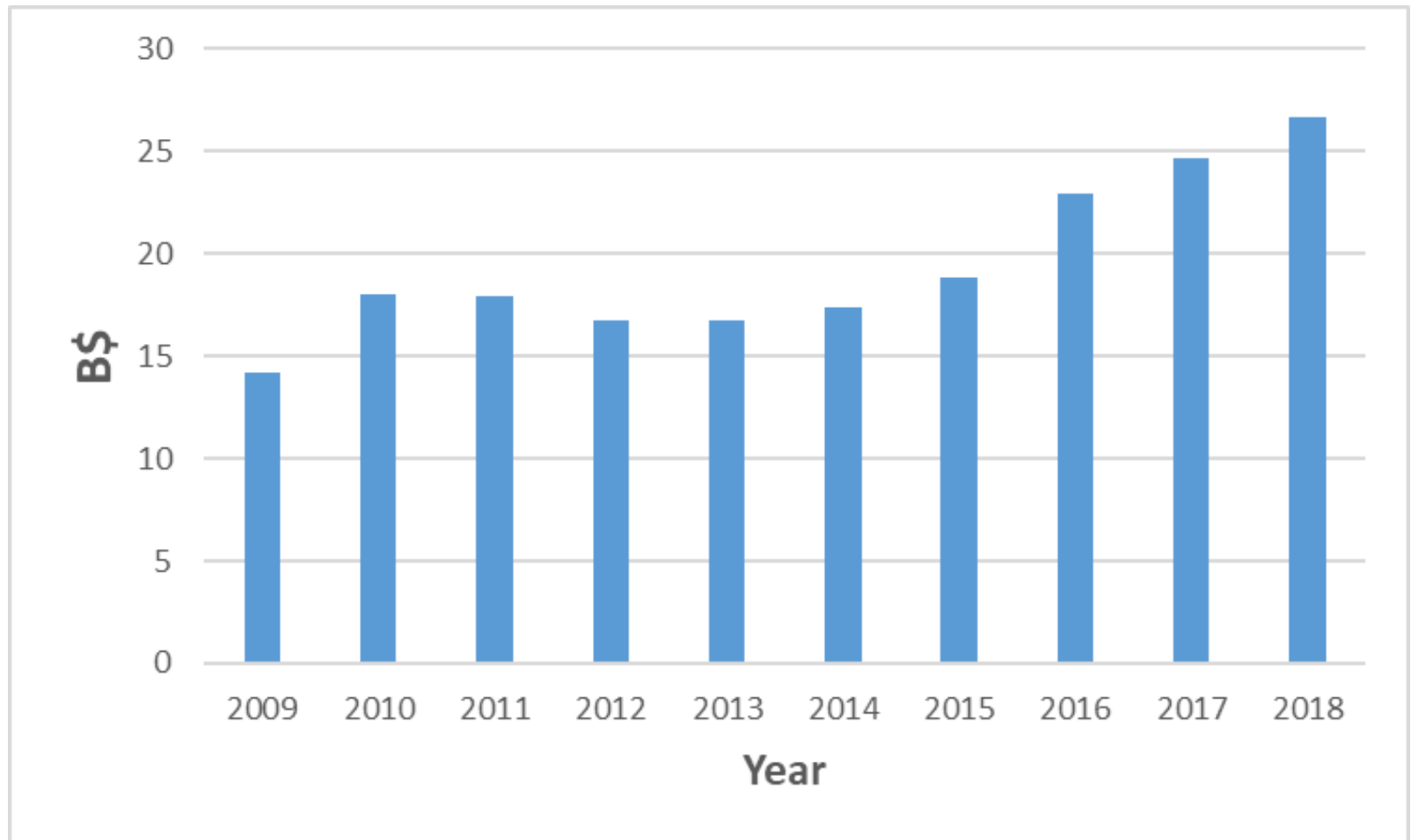**Total costs of ECSEL projects 2014-2016**

Revenues of main EU semiconductor companies
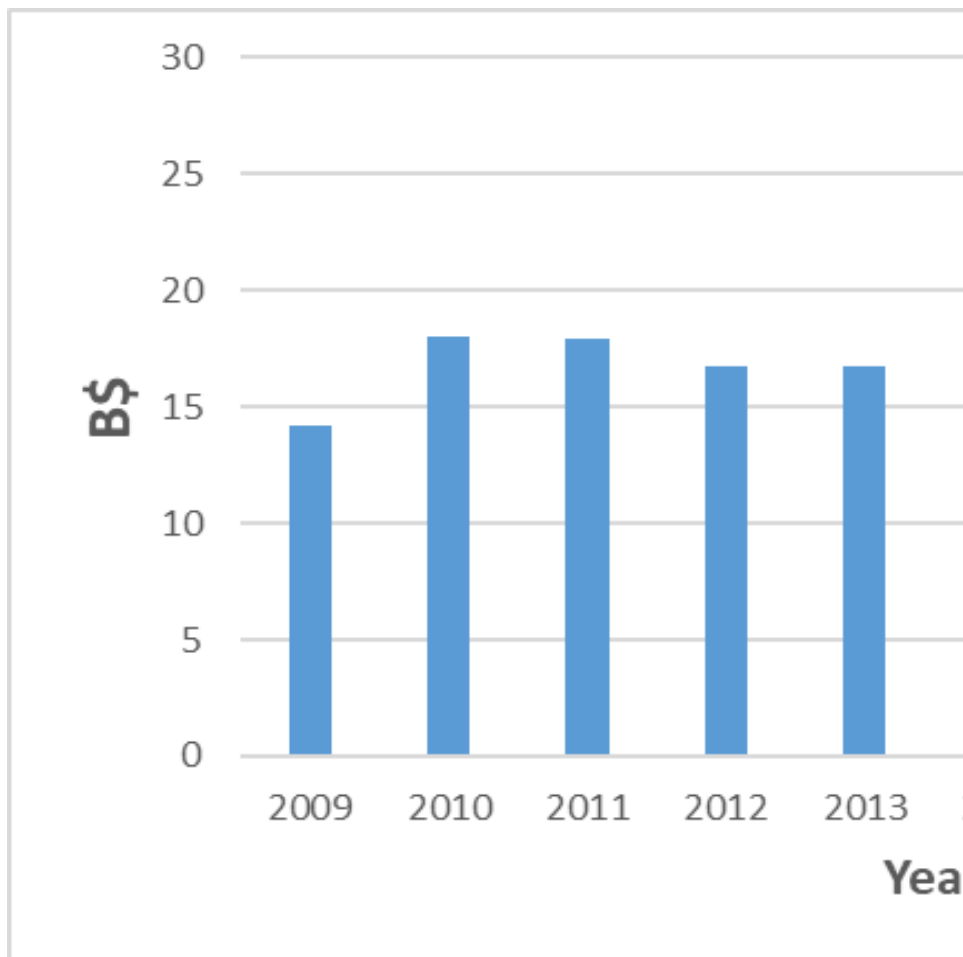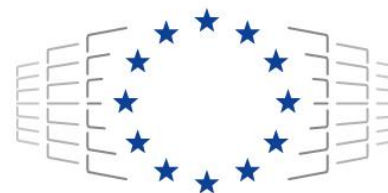

- EU industry revenues decreasing

- Low market value

- Exceptions:
  - Equipment, material
  - More than Moore

Revenues of main EU semiconductor companies

EuroHPC Joint Undertaking

A legal and funding agency created by the Council

- 28 Participating States + EU
- Site: Luxembourg
- Budget (2019-2020): ~1 Billion Euros (half from EU)
- Operational: 11/2018 to 2026

https://eurohpc-ju.europa.eu/

Mission: Establish an integrated world-class supercomputing & data infrastructure and support a highly competitive and innovative HPC and Big Data ecosystem

The JU is already delivering!

■ EuroHPC JU
   EuroHPC JU Participating Sta

EuroHPC JU Participating States

Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and Turkey.

The EuroHPC delivers a leading supercomputing infrastructure

High-range Supercomputers

3 sites for supercomputers selected
performance: 150-200 million billion operations per second

Investment: 650 million Euros
50% from EU and 50% from Consortium supporting the site

Sites and supporting Consortia

- Kajaani (FI) – FI, BE, CZ, DK, NO, PL, SE, CH, EE, NL
- Barcelona (ES) – ES, HR, PT, TR, IE
- Bologna (IT) – IT, SI

EuroHPC JU is the owner

Medium-to-high range Supercomputers

5 sites for supercomputers selected
performance: at least 4 million billion operations per second
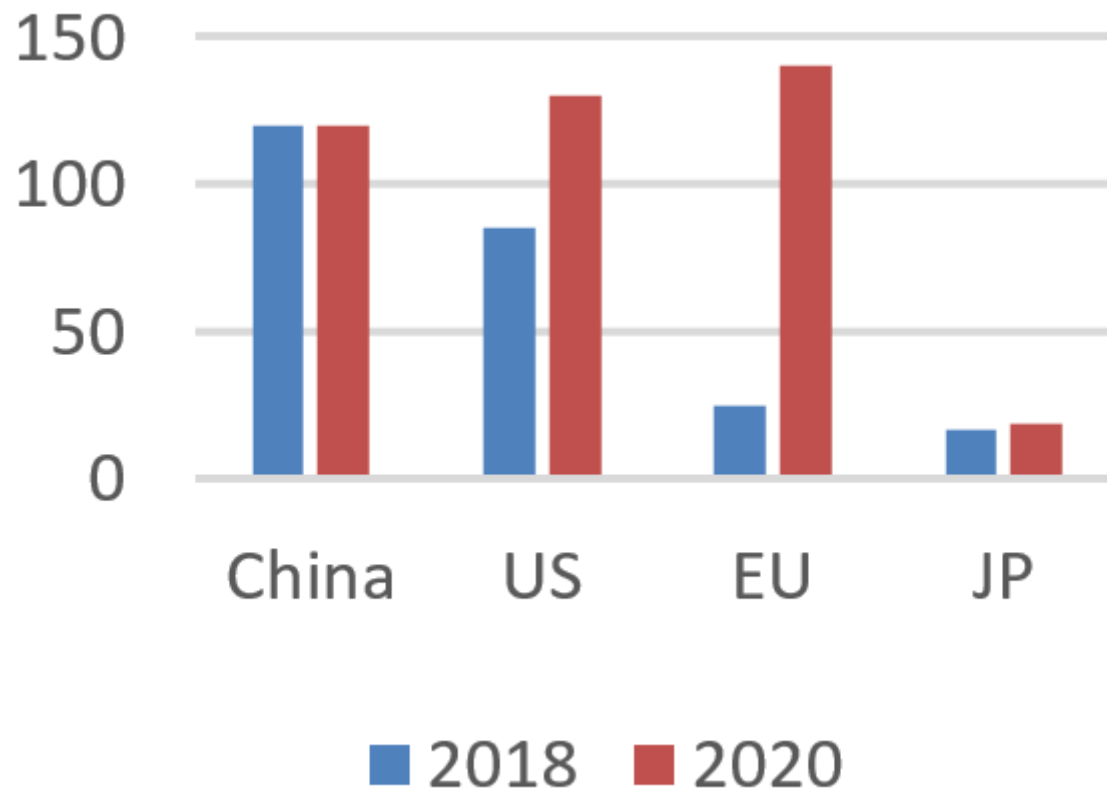
Investment: ~100 million Euros (CAPEX)
34 Million from EU

Sites and supporting Consortia

- Bissen (LU) – LU
- Minho (PT) – PT, ES
- Ostrava (CZ) – CZ
- Maribor (SI) – SI
- Sofia (BG) – BG

All supercomputers accessible to any user in Europe

- *Top 10 supercomputers, performance in Pflops*

The future: Making the digital transformation a success

Personalised medicine

Precision agriculture

Autonomous safe mobility

Energy/ Resource efficiency

Climate/env control

Higher productivity, Creativity ……

AI (everywhere)

Security/ Trust

Sustainability

Major trends (Human centric)

Advanced computing (edge, neurom,Quantum)

Data/V&AR

Connectivity Towards terabits/s

Low power components

Enablers

Need a coherent approach Using all policy instruments

Policy

- Keep on adapting the regulatory framework
  - Human centric & trustful AI, Safer Internet preserving our values,
  - Data and competition, cybersecurity,…

- Focused investments on **High Impact Projects/initiatives**
  - Projects/initiatives at scale for leadership in the digital supply chain
    - Cover the whole chain from components to platforms and applications
  - Work in partnership with industry/academia and MSs
    - Public support focused on attracting private investments
  - Scaling up and reinforcing successful initiatives, build on our strengths
    - ECSEL, IPCEI, EuroHPC, 5G,
  - Address the whole innovation chain from basic research up to <u>roll out</u>

- Complemented by **bottom up schemes** to spread innovation
  - DIHs, Start ups and scale ups (EIC…)

DIGITAL IN THE NEXT MFF: OVERVIEW

Digital Europe: Capacities & roll out

1. High Performance Computing
2. Artificial Intelligence (AI)
3. Cybersecurity
4. Advanced digital skills
5. Digital transformation and interoperability

€9.2 billion

Digital in Horizon Europe R&D&I

1. Digital under "global challenges"
   - Digital and industry cluster
   - Digital in other clusters - health, mobility, energy, environment,..
2. FET Open under EIC
3. Research Infra in Open Science

> Current budget (~14 B€)

Connecting Europe Facility - Digital Connectivity

- 5G roll out
- BB 4EU, Connecting communities
- Synergies with Transport /Energy

€3 billion

Creative Europe MEDIA

- Distribution of works
- Creation

€1.1 billion

Clusters in 'Global Challenges and Industrial Competitiveness

Clusters	Areas of intervention	
Health	* Health throughout the life course * Non-communicable and rare diseases * **Tools, technologies and digital solutions for health and care**	* Environmental and social health * Infectious diseases * Health care systems

Inclusive (1)
Secure (2)
Societies
	• Democracy, transformations
	   * Creativity
	   * Cultural heritage
	• ....
		* Disaster-resilient societies
		* Protection and Security
		* **Cybersecurity**

Digital and Industry	* Manufacturing technologies * Advanced materials * Space * Circular industries	* **Key digital technologies** * **AI & Robotics** * **Advanced computing, BD** * **Next generation internet**
Climate, Energy and Mobility	* Climate science and solutions * Energy systems and grids in energy * Communities and cities * Industrial competitiveness in transport * Smart mobility	* Energy supply * Buildings and industrial facilities transition * Clean transport and mobility * Energy storage
Food and Natural Resources	* Environmental observation * Agriculture, forestry and rural areas * Food systems * Circular systems	* Biodiversity and natural capital * Sea and oceans * Bio-based innovation systems

Digital Europe programme – what?

Reinforcing digital capacities. Ensuring their best use.

Digital transformation & Interoperability
1.3 € billion

Advanced digital skills
0.7 € billion

€ 9.2 billion in total

High performance computing
2.7 € billion

Cybersecurity & trust
2 € billion

Artificial intelligence
2.5 € billion
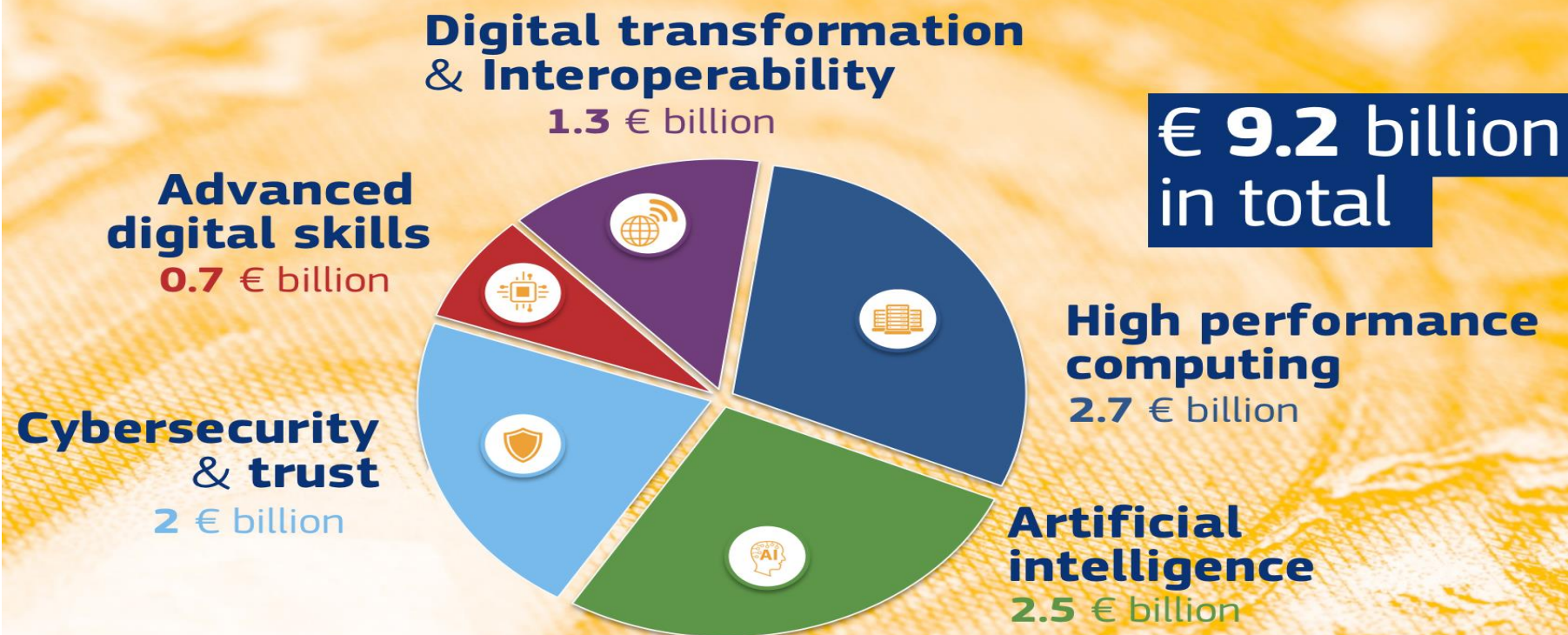
#EUBudget
#DigitalEurope

European Commission

Co-investing with MS in high-end infrastructures
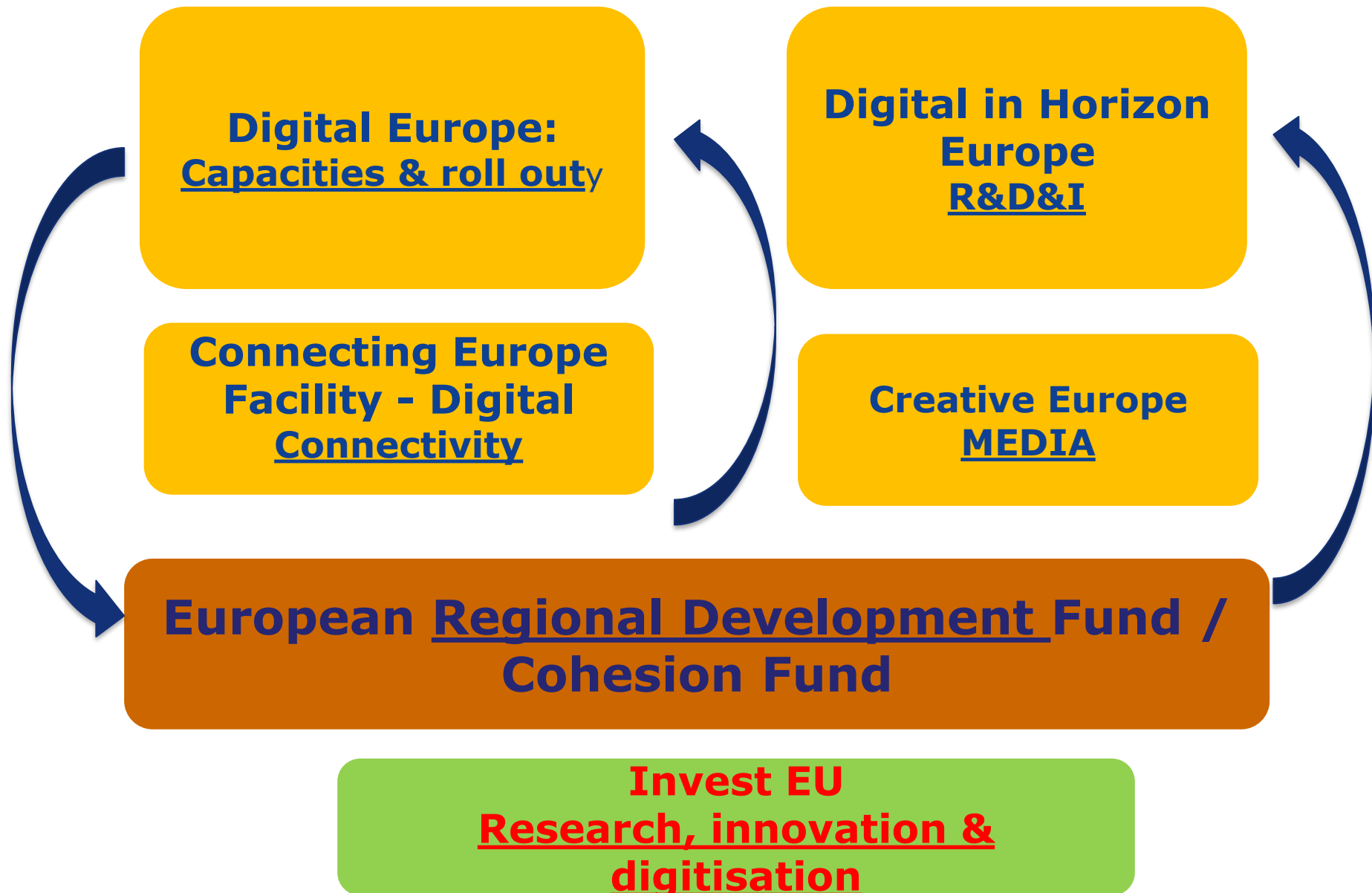
- In partnership with industry

Reinforcing existing MS capacities, networking and aggregating – making them available across the EU

Ensuring best use of capacities in public sector & industry

Complementarities with other programmes supporting digital

Digital Europe:
Capacities & roll outy

Digital in Horizon Europe
R&D&I

Connecting Europe Facility - Digital
Connectivity

Creative Europe
MEDIA

European Regional Development Fund / Cohesion Fund
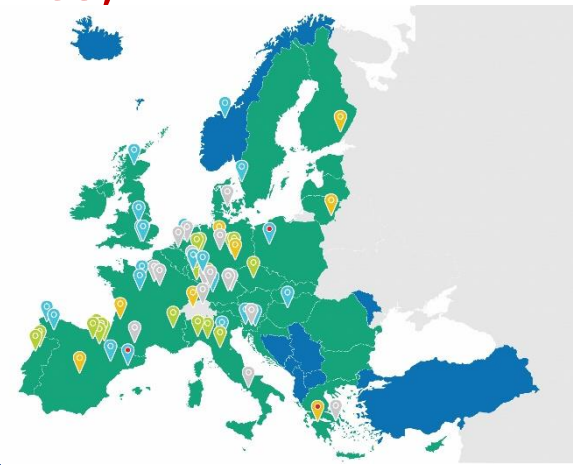
Invest EU
Research, innovation & digitisation

- Top participants in the Digital part of H2020
  - In the top 3

- Key players in "excellence" structuring activities
  - Cybersecurity networks of competence centres
    - 65 B€ of investments in 2018-20
    - Bringing together all best centres in the EU, common agenda
    - To be scaled up in next MFF: Cybersecurity centre & networks

  - AI networks of excellence centres: call on going, 50 M€
    - Bringing together all best centres in the EU, common agenda
    - To be scaled up in next MFF: AI in DEP and HE

  - DEI platforms

  -

- Key players in Digital Innovation Hubs activity
  - 500 M€ of investments
  - to bring latest technologies to all industries,
  - Focus on SMEs

- HPC competence centres
  - HPC to all businesses

- Holders of main Pilot lines in ECSEL
  - Equipment, low power components, More than more

- Large scale pilots in IoT and DEI:
  - Health, energy, agriculture, etc..

RTOs: Key players in digital in next MFF

- A pivotal role in **Digital Europe Programme**
  - DIH: close to 900 M€ to reinforce the centres capacities
    - AI, Data and advanced computing, Cybersecurity & trust
    - Technologies and applications:
    - climate, agri, manufacturing, health, mobility, etc..

  - Large scale testing facilities
    - Close to 1.2 B€ in **AI reference sites**,
    - From components to complete systems in real setting
    - Smart cities, homes, hospitals, vehicles, etc..

- in high impact projects: **From R&D to deployment**
  - HE, DEP, Invest EU, MSs, industry
  - Low power processors, Quantum computing and communication, Cloud federation, HPC, AI platforms, Blockchain, etc..

- *by joining effort, we can build the world most powerful digital ecosystem*

- *we can advance the technology, reinforce our capacities & **apply them for the benefits of our citizens and businesses***

- *Rtos are key players to rebuild/reinforce the EU digital supply chain*

- *and to prepare for the next generation: Quantum, edge computing, lower power, trustful software, self learning systems, …*

  - ***Hope we can count on you!***

Thank You!

From Top Sectors to Missions in NLs

'Mission-driven innovation policy with impact'

Mission Approach in the Netherlands

- ➤ **4 main themes**
- ➤ **Guide the development of 25 concrete missions**
- ➤ **Inspirational goals with links with societal needs**
- ➤ **Drafted in close cooperation between 8 Ministries**

New Approach with many benefits:

- Ministries have the initiative, in collaboration with RDI stakeholders and civil society

- Collaboration across the entire chain, from fundamental research to market introduction (TRL 1 to 9)

- Enables alignment with European approach

Energy / Sustainability	Agriculture / Water / Food	Health / Healthcare	Security

Key enabling technologies

Agenda bringing all actors together

Comprehensive R&I agenda:
improving the links between public and private research

Industry

Government

Science & Research
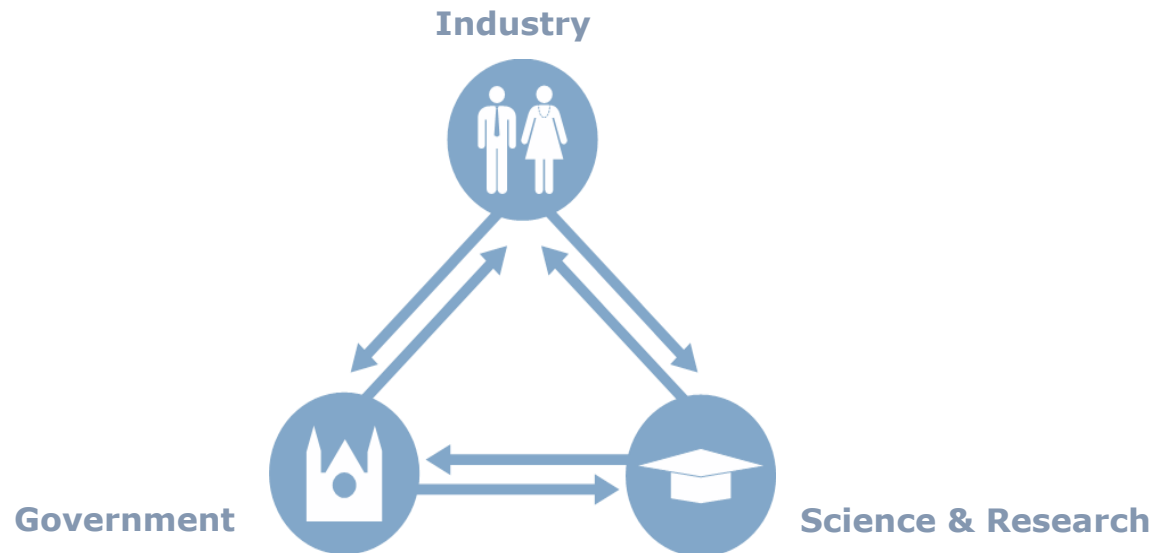
25 Missions: Examples	
Thematics	**Objectives**
Electricity system	Without CO2 in 2050
Circular economy	Halve the use of raw materials by 2030, achieved by 2050
Agriculture	Climate neutral in 2050 (-95% greenhouse gas emissions)
Sea	A sustainable and safe North Sea
Healthcare	50% delivered at home instead of in an institution by 2050
Security	The Netherlands in top-10 countries in cybersecurity by 2025
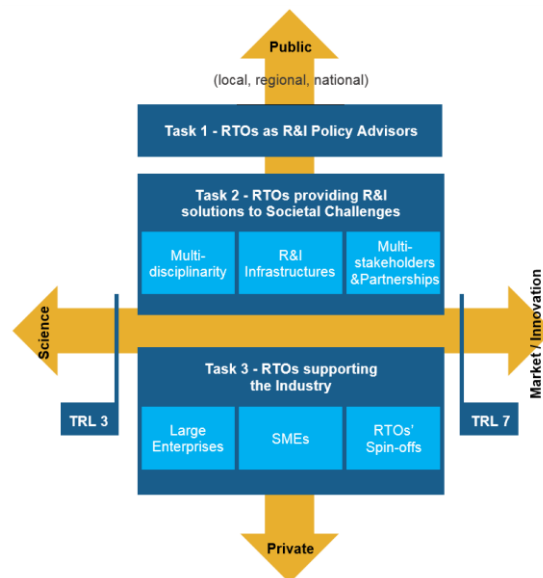
Partnerships: continuity needed!

- **Long-term trust-based instruments**
- **EU added-value: pan-EU collaborative research on key industrial sectors**
- **Linked to industrial policy and industrial value chains**
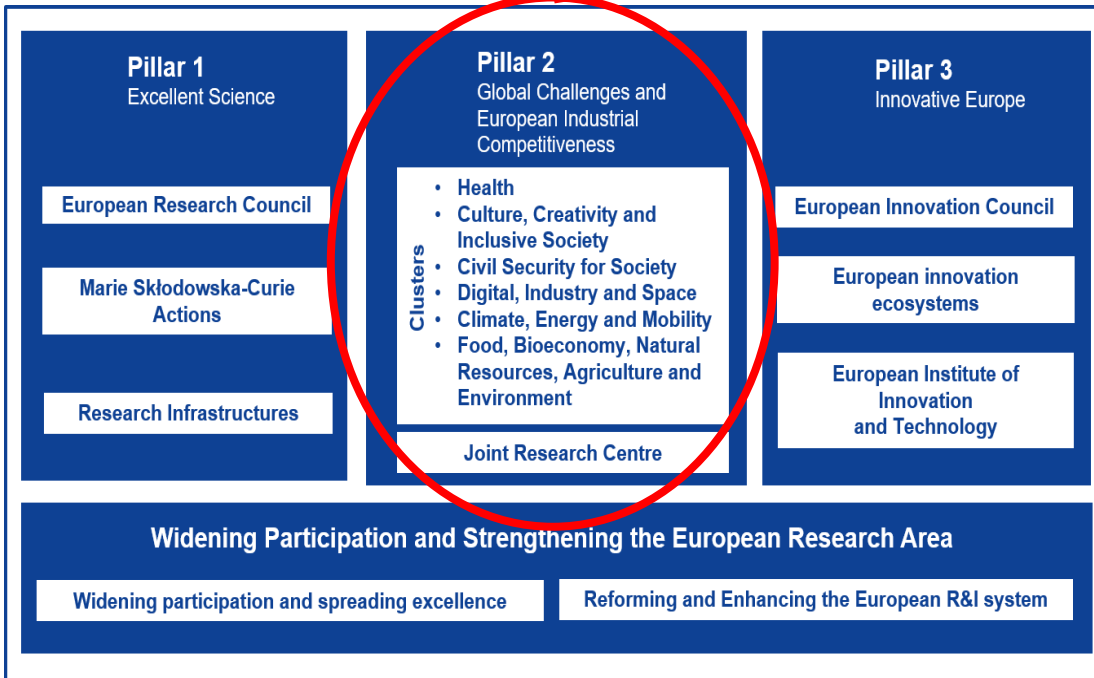
RTOs highly-involved:

- More than 70% of the EC funding under cPPPs for projects in which EARTO members involved

- ECSEL JTI: positive example of industry-RTOs' collaboration with more than 90% of the EC funding for projects with EARTO members involved

Budget

Pillar II:

- **40+ partnerships**
- **Budget cap for PPPs of 49% of pillar II budget**
- **Funding for lower TRL tech-driven RDI**

Pillar 1 Excellent Science	Pillar 2 Global Challenges and European Industrial Competitiveness	Pillar 3 Innovative Europe
European Research Council	Clusters: • Health • Culture, Creativity and Inclusive Society • Civil Security for Society • Digital, Industry and Space • Climate, Energy and Mobility • Food, Bioeconomy, Natural Resources, Agriculture and Environment	European Innovation Council
Marie Skłodowska-Curie Actions		European innovation ecosystems
Research Infrastructures		European Institute of Innovation and Technology
	Joint Research Centre	

Widening Participation and Strengthening the European Research Area

Widening participation and spreading excellence

Reforming and Enhancing the European R&I system

Call from 90+ industrial & RTOs associations for an ambitious Horizon Europe Programme:

➢ **Minimum of €120bn for Horizon Europe**

➢ **Minimum of 60% of Horizon Europe budget for Pillar II**

16 September 2019

Funding model

ECSEL Model:

➢ Joint funding with Member States

➢ Good model to be kept simple: no double application at EU & national level

GBER Exemption for combining funding

➢ Combination of shared management funds and centrally managed funds

➢ Stimulate synergies between the various EU funds: improve attractivity to EU-13

EARTO Joint Contribution to EC Consultation Reviewing the GBER

25 Sept 2019

Linking HEU Instruments

Industrial Leadership & Societal Challenges

40+ partnerships   to be linked with 5 Missions

Governance with RTOs

Technology Infrastructures: Backbone of Dynamic R&I Ecosystems

- **Constructed or simulated user environments**

- **Sector-specific or technology-focused**

> **Essential for new technology-based innovative products, services or processes to:**
>
> 1. reach high-enough maturation level
>
> 2. early-stage experimenting, developing upscaling, prototyping, in controllable and safe conditions
>
> 3. making new solutions market-ready, demonstrating their value for end-user clients and investors
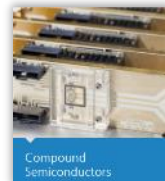
Technology Infrastructures: Characteristics

Unique front-running position in Europe

- ➤ Target: National, EU, international users/industry
- ➤ Focus: forward-looking, maturation and development of upcoming new and highly innovative key enabling technologies

Embedded in the local/regional innovation hubs

- ➤ Target: local users/industry, particularly SMEs
- ➤ Focus: transfer and effective uptake of existing commercially available technology by the market developing local industry's innovation capacity and business transformation

Research Fab Microelectronics Germany
- • 12 500 m² of cleanroom facilities
- • €350M initial public investment
- • Pooling of 13 RDI institutes (FHG & Leibniz)
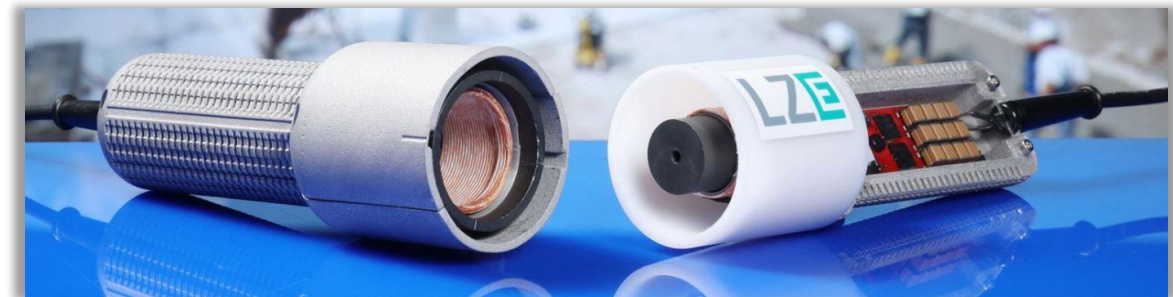
- • Electronic systems for digital change
- • Power Electronics
- • Low-Power Electronics

LZE Leistungszentrum Elektroniksysteme

Technology Infrastructures: Role of RTOs

Technology Infrastructures require high level of investment:

- High initial investments (not affordable by individual companies on their own)
- Maintenance and upscaling to ensure long-term sustainability at the forefront of innovation
- Running costs

Open access to RTOs' Technology Infrastructures:

- Lowering both the risk and the cost of innovation for industry
- Platform for collaboration with industrial partners (large & small)
- Access to RTOs' technological expertise and business support to make innovation market-ready

➢ **Technology infrastructures require public investment and management by RTOs**
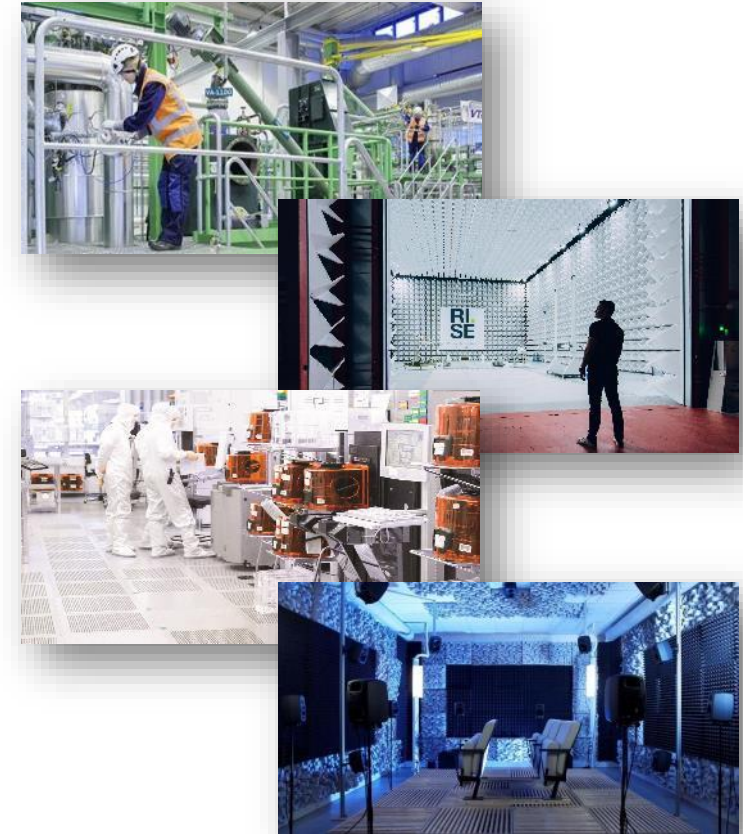
Technology Infrastructures: Towards a European Strategy

- ➢ **Ensure that we have the tech infra required to answer technology needs and support European industry: no gaps!**
  - Boost public & private investments and ensure a sustainable funding mix
  - Build tech infra with sustainable business models to ensure long-term sustainability
  - Regulatory framework such as State Aid rules should not create counterproductive barriers
- ➢ **Increase visibility of tech infra in the policy landscape, reinforce synergies, reduce duplication and overlap**
- ➢ **Ensure pan-European access to tech infra in Europe and connect regional-based tech infra together**

RTOs' Spin-offs: Delivering Impact!

387 spin-offs created by 7 RTOs and still active in 2016, generated:

- 18,800 jobs national & regional
- €2.4 billion revenue
- €1.1 billion value added
- €0.5 billion fiscal and parafiscal return to governments

A SURVIVAL RATE OF

- 97% after 1 year (compared to EU average of 87%)
- 83% after 5 years (compared to EU average of less than 50%)
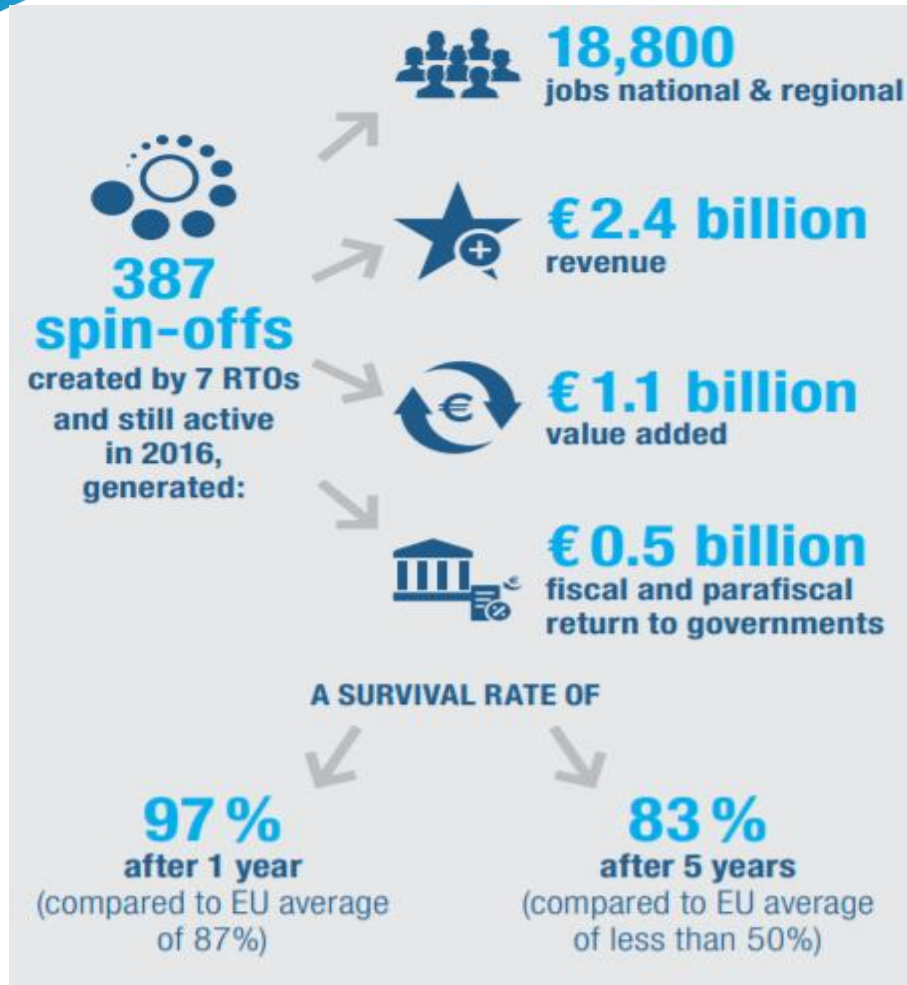
ARYBALLE Technologies

CEA spin-off ARYBALLE

NeOse technology: a Digital nose for success

➢ NeOse can detect **more than 700 different odours** and deliver results within **30 seconds**

➢ **50 NeOse devices of €10k each ordered in first 6 months** by 10 world leading fragrance companies

Making Innovations Investment-Ready: RTOs' Operational Support to Deep-Tech Start-Ups

RTOs' multifaceted support provided to their deep-tech start-ups at every step of the way is crucial to their success:

- Detection of promising projects at early stages
- Support to build the business case
- Support for the validation phase (pilots & prototypes)
- Access to in-house technological infrastructures
- Transfer of strong Intellectual Property Rights
- Support to build smart teams
- Financial support & advice (label as due diligence)
- Connecting to industry and finding customers

SUPER NOVA INVEST

- Created in 1999 as CEA Investment with fund of €72M
- Since 2017: 5 funds totalling €250M
- Financed 100+ start-ups since 1999
- 5 tech areas: life sciences, energy & environment, industry, microelectronics and digital

Recommendations for the EIC

> **EIC should build on RTOs' success and support them to boost start-ups' creation and scaling up**

- **EIC Pathfinder: pre-seed funding grant to make innovation investment-ready (equity too risky at this stage)**
  - target a few game-changing and market-creating deep-tech innovations with scale-up potential
  - make them investment-ready, increasing both the technological and commercial readiness-level
  - increase the length of the maturation/incubation phase to secure the market of the future deep-tech start-up

- **EIC Accelerator: Increase public & private support to provide liquidity to start-ups at a later stage after their creation**
  - Avoid that the deep-tech start-ups that were nurtured in the EU move out of Europe to places where funding is more accessible

... but in practice

Risks of unballanced EU policy on IPR VS Open Science:

- **Weakening of the IP system in Europe**

- **Disruption of the EU R&I Ecosystem, bringing additional risk and uncertainty**

- **Risk for RTO-industry collaboration (incl. In FPs)**

Need to speak the same language:

- **"Open" does not mean "Free"**

- **"Open" does not mean "Now"**

EU State Aid Rules

"The current State Aid rules are perceived as insufficiently innovation-friendly. While designed to avoid unfair competition within the single market, they should not act as a barrier to strategic investments which correspond to EU priorities." **LAB-FAB-APP report**

"The EU's State aid Framework constitutes a handicap for EU industry and research. […] The EU RDI State aid rules which add a supplementary legal layer to each Member State's national innovation policies are complex, time-consuming and restrictive. There is no equivalent abroad." **ENIRI report**

**EARTO Note
on EU State Aid Rules
for Research &
Innovation**

COMPETITION

30 January 2018

Horizon Europe Financial Framework

Make everything as simple as possible, but not simpler.

Albert Einstein

Personnel Costs in Horizon Europe

EC proposal to calculate personnel costs on daily rates instead of hourly rate in Horizon Europe would not bring the simplification intended.

Hourly rates:
- RTOs' main cost driver
- Basis of RTOs' time recording systems
- RTOs' usual cost accounting practice

➢ **Keep H2020 rules for personnel costs**
➢ maintain option of using average personnel costs
➢ number of productive hours set in accordance with the usual cost accounting practices of beneficiaries

Daily rate:
- not available in RTOs' accounting systems
- not a cost driver