



EU R&I Beyond H2020

Preparing Our Digital Future

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EU Electronics Strategy (ELG 2014)

What have we done so far?

- An ambitious tripartite Joint Undertaking (ECSEL)
- R&D and first deployment (IPCEI)
- Higher layers: Digitising European Industry
 - EuroHPC, reinforcing the supply chain,
 - LPP initiative
 - Digital Innovation Hubs
- An EU wide AI strategy
- A cybersecurity strategy
- Accelerating the demand (IoT, 5G, CAM)



ECSEL JU: A tri-partite model

PPP with a large budget: €5 billion for 2014-2020

- + €1.2 billion from the EU
- + €1.2 billion from participating States
- + Over €2.4 billion from industry

Calls (RIAs and IAs) on a yearly basis

- Industry drive and commitment
- Involvement of MS: finances and governance
- Leveraging more substantial resources
- Avoiding fragmentation and duplication
- Strategic alignment and longer term planning

Close to 400 M€ of EU funding still to come in 2019-20 to be matched by MSs funding



H2020: Relevant Calls (2019) 1/2

- **Unconventional Nanoelectronics**

Neuromorphic, quantum, spintronics, single-electron

- **Computing techno and engineering methods for CPS**

- **Smart Anything Everywhere**

Cyber-physical and embedded systems, Customised low energy computing powering CPS and the IoT, Flexible and Wearable Electronics, Widening Digital Innovation Hubs



H2020: Relevant Calls (2019) 2/2

- **Materials, manufacturing processes and devices for organic and large area electronics**
 - Material development and improvement
 - Co-funded by LEIT-NMBP and LEIT-ICT

- **Digital Manufacturing Platforms for Connected Smart Factories**
 - Fully exploit new concepts and technologies



Artificial Intelligence for Europe strategy

Boosting the EU's technological and industrial capacity and AI uptake across the economy, through

- Stepping up investments
- Strengthening research and innovation from the lab to the market
- Supporting AI research excellence centres across Europe
- Bringing AI to all small businesses and potential users
- Supporting testing and experimentation
- Attracting private investments

EuroHPC initiative

- A JU, 480 M€ of EU funding over 2 years
 - H2020 and CEF
 - Matched by a similar amount from MSs
- Two tracks:
 - Acquiring/deploying HPC capacities
 - Pre-exascale in 2020, exascale by 2022-23
 - R&D&I covering whole HPC supply chain
 - Including Low Power processor, accelerators,...



Components: Where does EU stand?

- EU strong in emerging, rapid growing areas:

- Smart car
- Industry 4.0
- Personalised healthcare

These areas will increasingly require very advanced components to address sophisticated artificial intelligence and include communication functionalities

But

- EU practically absent in key components for
Computer, Consumer, Communication markets.

Is it sustainable?

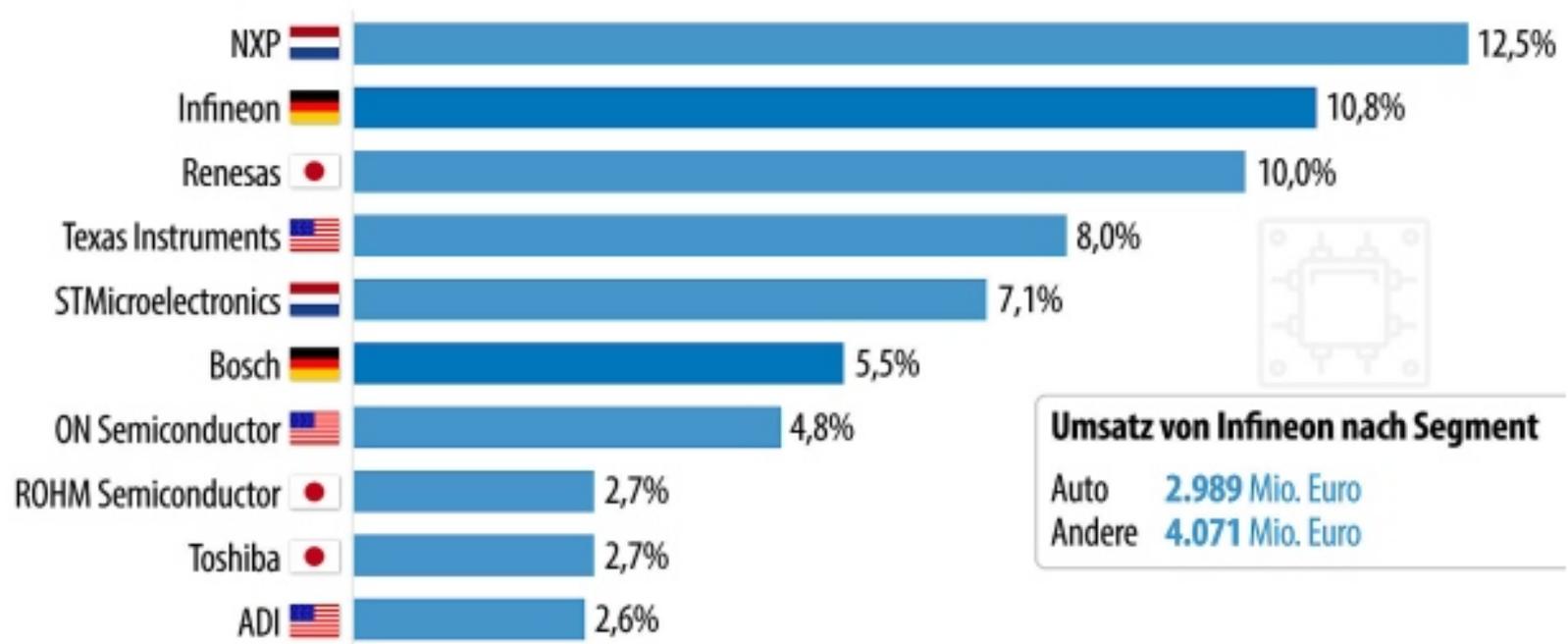


Automotive suppliers

World top-ten

Top-Hersteller von Computer-Chips für Autos

Marktanteile der Hersteller von Automobilhalbleitern am Umsatz weltweit 2017



EU: 4 companies in the top-ten (36% world market)
Top-ten: 66% of the world market



European
Commission

Communications Networks,
Content & Technology

A budget aligned to political priorities

In billion euro, current prices

I. SINGLE MARKET, INNOVATION AND DIGITAL
€187.4

- 1 Research and Innovation
- 2 European Strategic Investments
- 3 Single Market
- 4 Space

II. COHESION AND VALUES
€442.4

- 5 Regional Development and Cohesion
- 6 Economic and Monetary Union
- 7 Investing in People, Social Cohesion and Values

III. NATURAL RESOURCES AND ENVIRONMENT
€378.9

- 8 Agriculture and Maritime Policy
- 9 Environment and Climate Action

IV. MIGRATION AND BORDER MANAGEMENT
€34.9

- 10 Migration
- 11 Border Management

V. SECURITY AND DEFENCE
€27.5

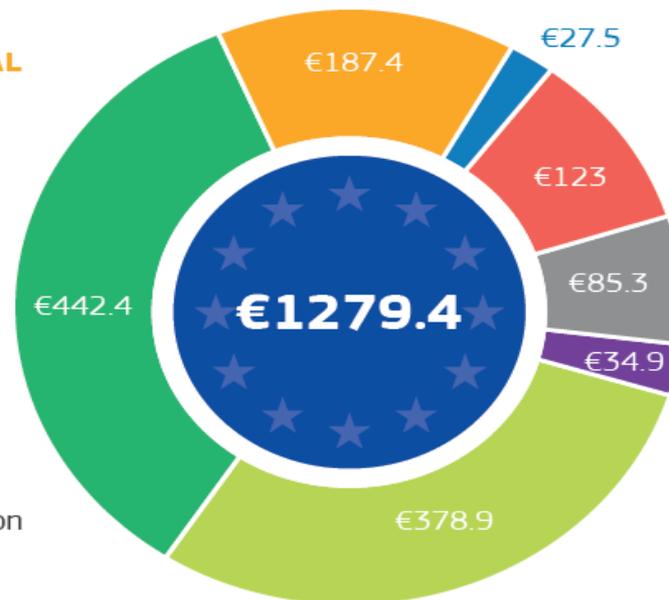
- 12 Security
- 13 Defence
- 14 Crisis Response

VI. NEIGHBOURHOOD AND THE WORLD
€123

- 15 External Action
- 16 Pre-Accession Assistance

VII. EUROPEAN PUBLIC ADMINISTRATION
€85.3

- 17 European Public Administration



Digital in MFF 2021-2027

Objective: *ensure that **Europe drives the digital transformation** of society and economy, bringing benefits to **all citizens and businesses***

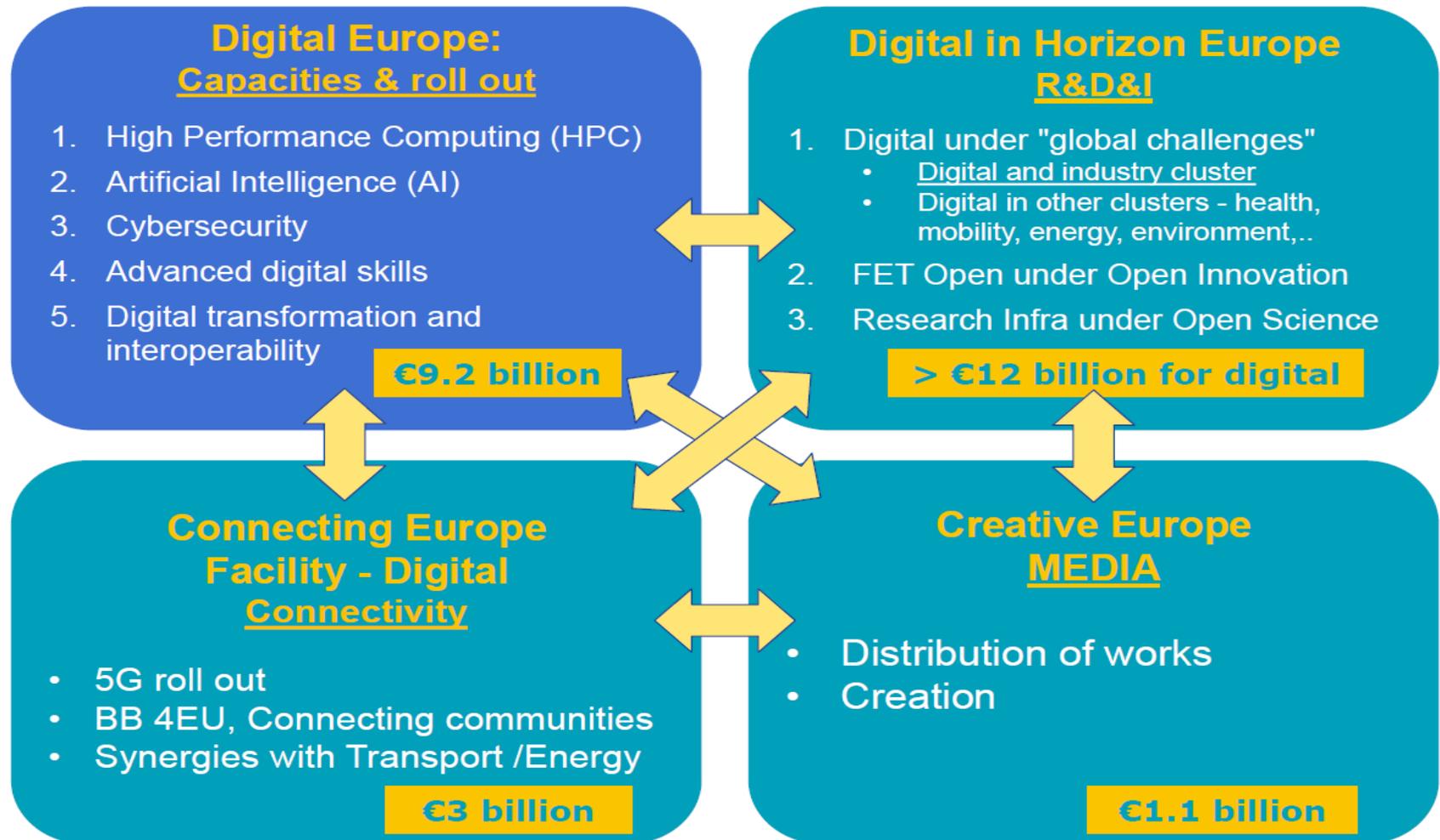


More specifically to:

- Reinforce the EU's digital capacities (computing, data, cybersecurity, AI,..)
- Ensure their widest possible roll out and maximise their benefits
- Prepare for and lead the development of next generation technologies
- Build a world-leading connectivity infrastructure
- Support creators and ensure the widespread distribution of their works

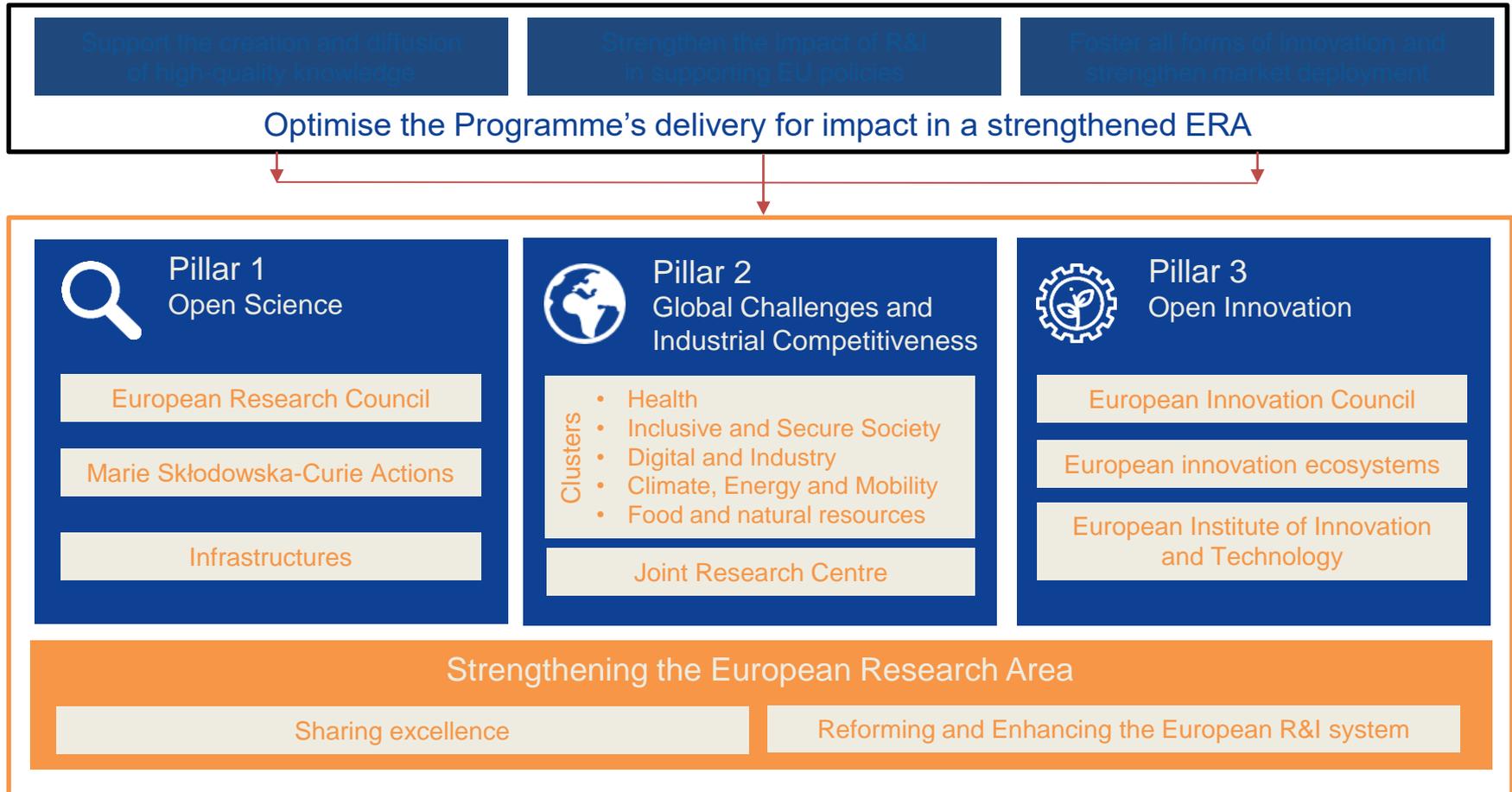


Digital in MFF 2021-2027 Programmes



Horizon Europe: evolution not revolution

Specific objectives of the Programme



Global Challenges & Industrial Competitiveness:

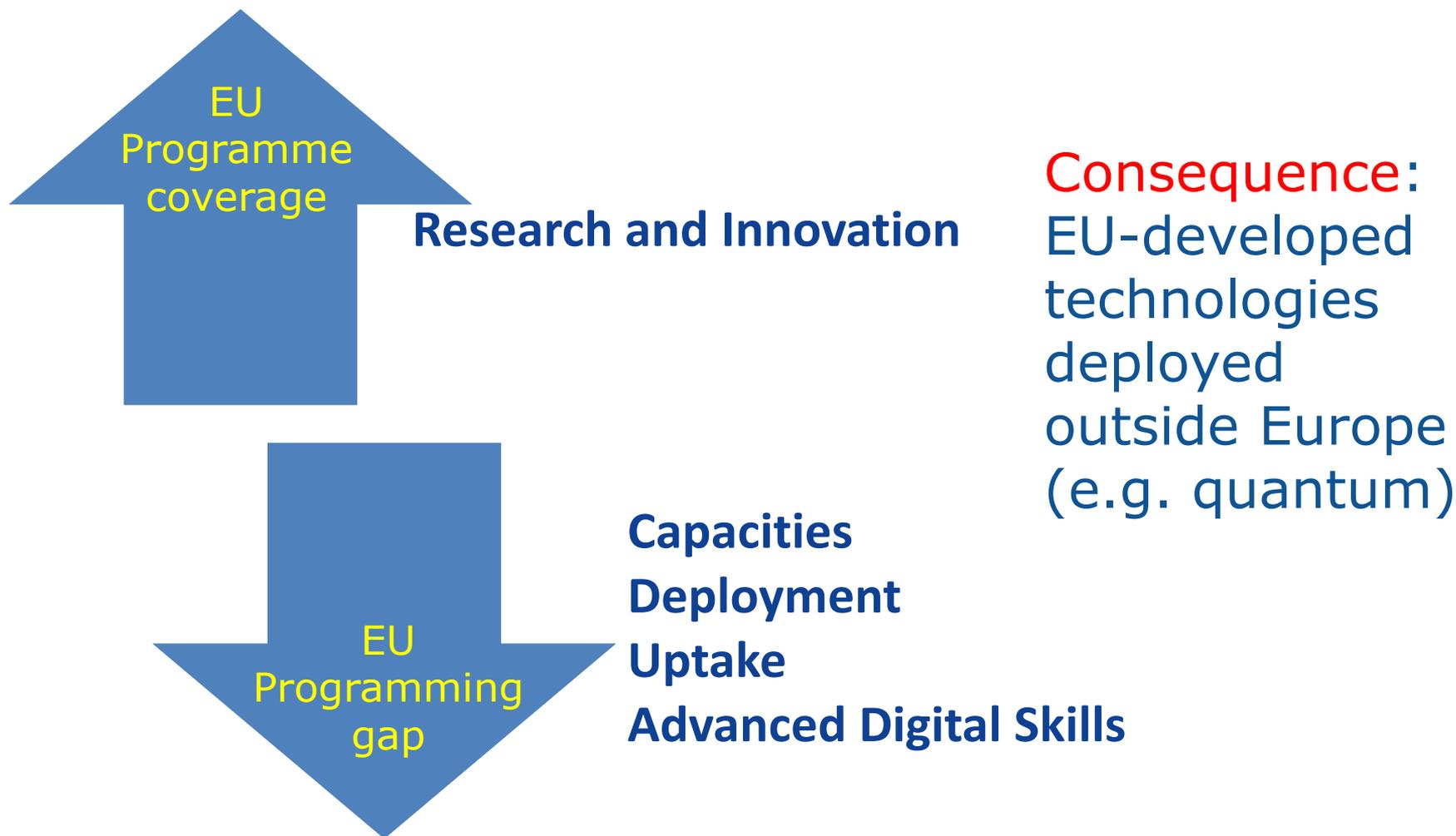
boosting key technologies and solutions underpinning
EU policies & Sustainable Development Goals

Clusters implemented through usual calls, missions & partnerships	Budget (€ billion)
Health 	€7.7
Inclusive and Secure Societies 	€2.8
Digital and Industry 	€15
Climate, Energy and Mobility 	€15
Food and Natural Resources 	€10

Clusters in 'Global Challenges and Industrial Competitiveness'

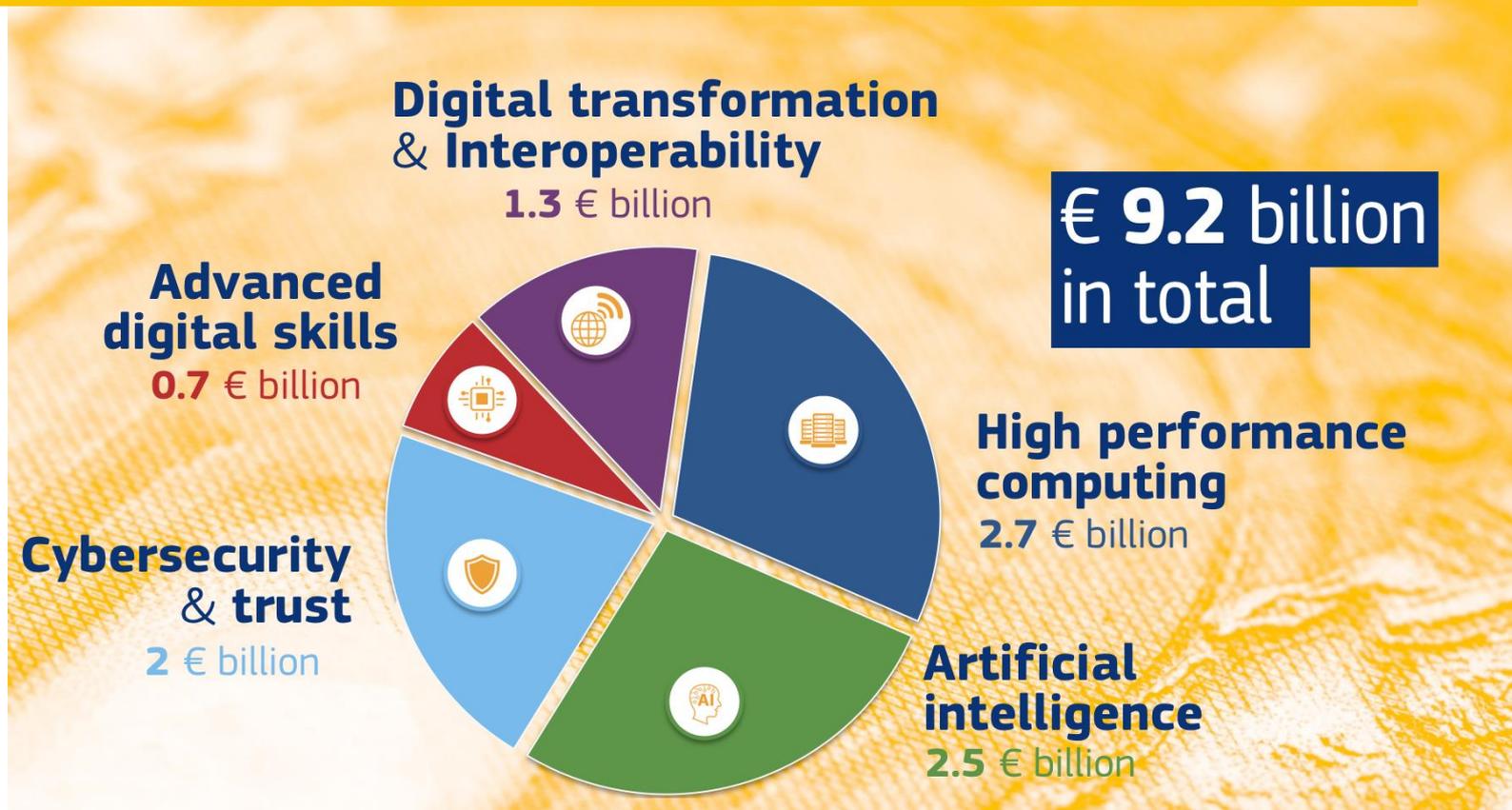
Clusters	Areas of intervention	
<p>Health</p> 	<ul style="list-style-type: none"> * Health throughout the life course * Non-communicable and rare diseases * Tools, technologies and digital solutions for health and care 	<ul style="list-style-type: none"> * Environmental and social health determinants * Infectious diseases * Health care systems
<p>Inclusive and Secure Societies</p> 	<ul style="list-style-type: none"> * Democracy * Social and economic transformations * Protection and Security 	<ul style="list-style-type: none"> * Cultural heritage * Disaster-resilient societies * Cybersecurity
<p>Digital and Industry</p> 	<ul style="list-style-type: none"> * Manufacturing technologies * Advanced materials * Space * Circular industries 	<ul style="list-style-type: none"> * Key digital technologies * Artificial intelligence and robotics * Advanced computing and Big Data * Next generation internet
<p>Climate, Energy and Mobility</p> 	<ul style="list-style-type: none"> * Climate science and solutions * Energy systems and grids * Communities and cities * Industrial competitiveness in transport * Smart mobility 	<ul style="list-style-type: none"> * Energy supply * Buildings and industrial facilities in energy transition * Clean transport and mobility * Energy storage
<p>Food and Natural Resources</p> 	<ul style="list-style-type: none"> * Environmental observation * Agriculture, forestry and rural areas * Food systems * Circular systems 	<ul style="list-style-type: none"> * Biodiversity and natural capital * Sea and oceans * Bio-based innovation systems

Lessons learnt – missing instrument



Digital Europe programme – What?

Reinforcing digital capacities. Ensuring their best use.



#EUBudget
#DigitalEurope

Coordinated public investments at EU level

- Targeting areas where EU investment has clear added value
- High investment levels that no Member State can do alone
- Areas where there is a need to aggregate resources
 - computing power, data, expertise
- Areas where scale matters for wide diffusion across the EU

Three levels of intervention



- Co-investing with MS in high-end infrastructures



- Reinforcing existing capacities
 - **Computing resources, Data sets, testing and experimentation**



- Ensuring best use of capacities in public sector & industry

A coherent package



- Focuses on key areas



- Complementarity and synergies



Targets and Impact – Some examples (1)

HPC



- Two exascale machines by 2022/2023 (at least one with European technology)
- At least one post-exascale machine by 2027
- Hybrid HPC-Quantum infrastructure by 2027

Cybersecurity



- By 2025: Self-healing cybersecurity systems in major critical infrastructures and public administrations
- By 2025: post quantum cryptography systems

Artificial Intelligence



- By 2022: World class reference sites for real scale testing of AI in health, mobility, smart cities, etc..
- By 2023: 5-10 % of public sector data easily available for innovators and researchers across the EU

Advanced Digital skills



- Increase ICT specialist employment from 8.2 million in 2016 to 12 million in 2027
- Increase growth rate/per year of ICT specialists from 3.3% (2007-16) to 4.3% (2016-27).

Targets and Impact – Some examples (2)



Modernisation of public administration

- By 2030: 450 million citizens and 24 million SMEs benefit from "Once Only Principle" for their administration information
- By 2022, operate a public block chain infrastructure enabling cross-border public services serving as a catalyst for new innovative services developed by start-ups and SMEs
- Multilingual services for public administrations



Services in areas of public interest

- By 2025: European eCard for all high education students
- Better internet for kids
- Europeana and preserving Europe's Cultural Heritage



Digital health

- By 2022: 1 million sequenced genomes
- By 2027: 450 million citizens have access to health records,
- 100 million citizens have personalised health systems
- Data from 10 million citizens available for new discoveries



Digital Innovation Hubs

- 250 Hubs across the EU
- 90 experiments per hub
- Reaching ~42000 SMEs

Thank you!

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