



Horizon Europe calls

ECS Brokerage Event

18 January 2022

Arian Zwegers

Agenda

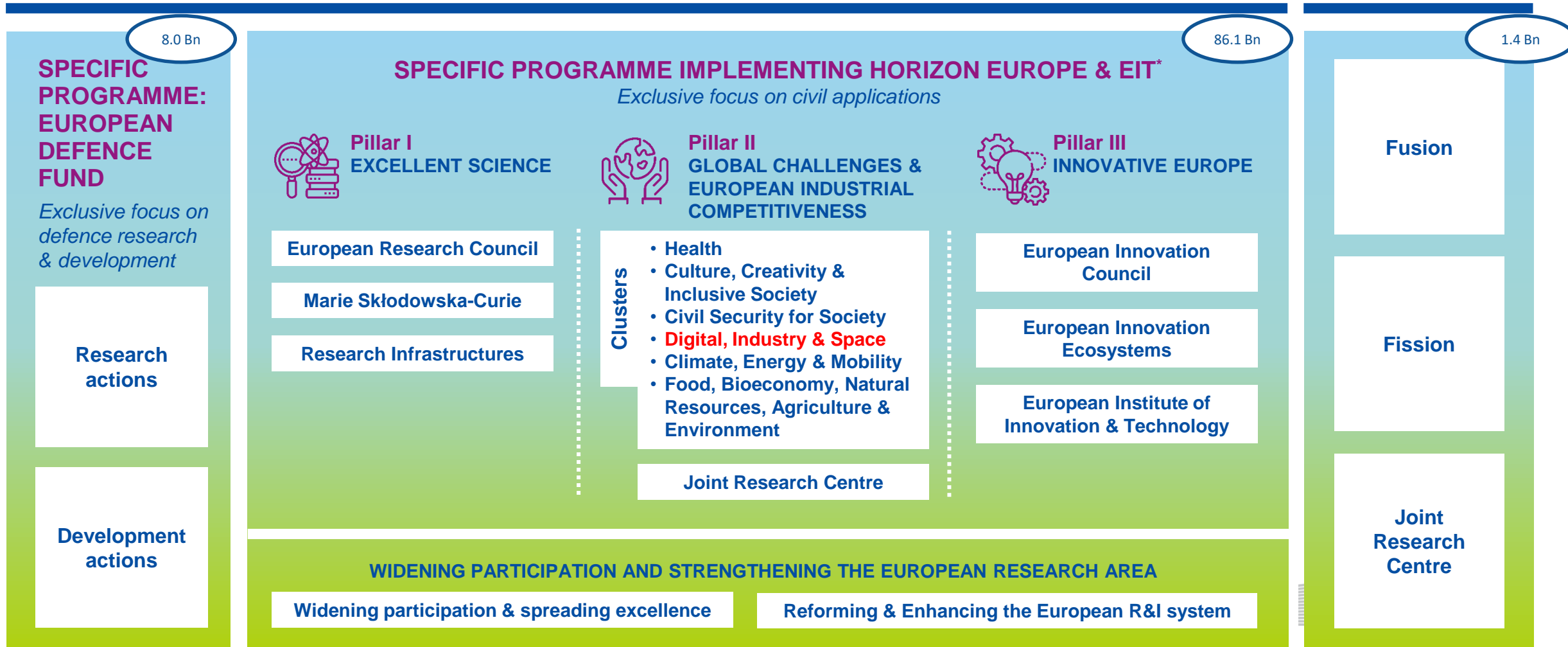
- Horizon Europe
 - Programme structure
 - Upcoming calls for Electronics and Photonics topics
 - Calls for other Destination 3 and 4 topics
 - European Partnerships
- Digital Europe programme
 - Testing and Experimentation Facility for Edge AI
 - Industrial Alliance
- Important Project of Common European Interest

Horizon Europe

Total 95.5 B€, in current prices

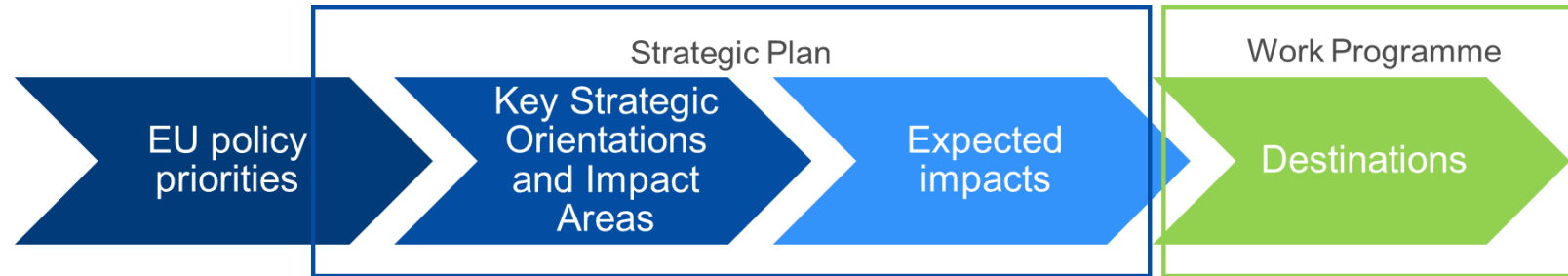
HORIZON EUROPE

EURATOM



Cluster 4 – Strategic Priorities

From EU priorities to Work Programme Destinations



Cluster 4 directly supports three of the four Key Strategic Orientations of the Strategic Plan 2021-2024

- Promoting an open strategic autonomy by leading the development of key digital, and enabling and emerging technologies, sectors and value chains (A)
- Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy (C)
- Creating a more resilient, inclusive and democratic European society (D)

KEY STRATEGIC ORIENTATION	EXPECTED IMPACT	DESTINATION
Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy (C)	Global leadership in clean and climate-neutral industrial value chains, circular economy and climate-neutral digital systems and infrastructures (networks, data centres) , through innovative production and manufacturing processes and their digitisation, new business models, sustainable-by-design advanced materials and technologies enabling the switch to decarbonisation in all major emitting industrial sectors, including green digital technologies.	TWIN-TRANSITION
Promoting an open strategic autonomy by leading the development of key digital, and enabling and emerging technologies, sectors and value chains (A)	Industrial leadership and increased autonomy in key strategic value chains with security of supply in raw materials , achieved through breakthrough technologies in areas of industrial alliances, dynamic industrial innovation ecosystems and advanced solutions for substitution, resource and energy efficiency, effective reuse and recycling and clean primary production of raw materials, including critical raw materials and leadership in circular economy.	RESILIENCE
	Globally attractive, secure and dynamic data-agile economy by developing and enabling the uptake of the next-generation computing and data technologies and infrastructures (including space infrastructure and data), enabling the European single market for data with the corresponding data spaces and a trustworthy artificial intelligence ecosystem.	DATA
	Open strategic autonomy in digital technologies and in future emerging enabling technologies by strengthening European capacities in key parts of digital and future supply chains, allowing agile responses to urgent needs, and by investing in early discovery and industrial uptake of new technologies.	DIGITAL-EMERGING
	Open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data , including by reinforcing the EU's independent capacity to access space, securing the autonomy of supply for critical technologies and equipment and fostering the EU's space sector competitiveness.	SPACE
Creating a more resilient, inclusive and democratic European society (D)	A human-centred and ethical development of digital and industrial technologies , through a two-way engagement in the development of technologies, empowering end-users and workers, and supporting social innovation.	<div>HUMAN</div> 

Cluster 4 – budget distribution

WP2021-22

Total budget of 15.348 B€ over 2021-2027 (including NGEU)
For the WP 2021-2022, the **programmable budget is ~3.5 B€**, distributed *approximately* as follows

DESTINATION	BUDGET 2021-2022
Destination 1 'Climate neutral, circular and digitised production'	738 M€
Destination 2 'Increased autonomy in key strategic value chains for resilient industry'	776 M€
Destination 3 'World leading data and computing technologies'	346 M€
Destination 4 'Digital and emerging technologies for competitiveness and fit for the green deal'	750 M€
Destination 5 'Open Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data'	519 M€
Destination 6 'A Human-centred and ethical development of digital and industrial technologies'	327 M€
Other Actions (other than Space Other Actions and SGAs)	58 M€

Cluster 4 – Destinations

Short name

Full name

Topics include:

TWIN-TRANSITION

1. Climate neutral, circular and digitised **production**

Green, flexible, digital Manufacturing;
Construction; Renewable resources, waste

RESILIENCE

2. A digitised, resource-efficient and **resilient industry**

Materials (raw, green, sustainable);
Multi-functional materials, green electronic materials

DATA

3. World leading **data** and computing technologies

Data, platforms, Cloud to Edge computing,
Internet infrastructures

DIGITAL-EMERGING

4. **Digital** and **emerging** technologies for competitiveness and fit for the green deal

Electronics, Photonics, low-power processors, AI,
6G, Robotics, Quantum, Graphene

SPACE

5. Strategic autonomy in developing, deploying and using global **space**-based infrastructures, services, applications and data

Space, Satellite, Observation systems,
space services

HUMAN

6. A **human**-centred and **ethical** development of digital and industrial technologies

Trustworthy AI, Ethics, Next Generation Internet,
digital interaction, digital learning

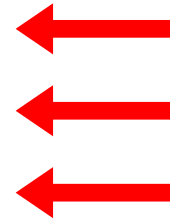
Cluster 4

Destination 4

DIGITAL-EMERGING

Sections

- Ultra-low power processors
- European Innovation Leadership in Electronics
- European Innovation Leadership in Photonics
- 6G and foundational connectivity technologies
- Innovation in AI, Data and Robotics
- Tomorrow's deployable Robots
- European leadership in Emerging Enabling Technologies
- Flagship on Quantum Technologies
- Graphene



Topics

Ultra-low power Processors, Electronics and Photonics

HORIZON-CL4-2021-DIGITAL-EMERGING-01-01



Ultra-low-power, secure processors for edge computing (RIA)

HORIZON-CL4-2021-DIGITAL-EMERGING-01-05



Open Source Hardware for ultra-low-power, secure processors (CSA)

HORIZON-CL4-2021-DIGITAL-EMERGING-01-31



Functional electronics for green and circular economy (RIA)

HORIZON-CL4-2021-DIGITAL-EMERGING-01-06



Advanced optical communication components (IA)

HORIZON-CL4-2021-DIGITAL-EMERGING-01-07



Advanced Photonic Integrated Circuits (RIA)

2021

HORIZON-CL4-2022-DIGITAL-EMERGING-01-26

Open source for cloud-based services (RIA)

2022

HORIZON-CL4-2022-DIGITAL-EMERGING-01-38



International cooperation in semiconductors (CSA)

HORIZON-CL4-2022-DIGITAL-EMERGING-01-03



Advanced multi-sensing systems (RIA)

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Destination 3

DATA

World leading data and computing technologies

SECTIONS	NUMBER OF TOPICS		ESTIMATED BUDGET (M€)	
	2021	2022	2021	2022
Data sharing in the common European data spaces	2	1	82	52
Strengthening Europe's data analytics capacity		2		63
From Cloud to Edge to IoT for European Data	3	2	59	90
TOTAL WP 2021-2022	5	5	141	205

EuroHPC JU: 243 MEUR

Cluster 4

Call HORIZON-CL4-2022-DATA-01, open until 5 April 2022

Data sharing in the common European data spaces

- -04: Technologies and solutions for data trading, monetizing, exchange and interoperability (AI, Data and Robotics Partnership) (IA)

Strengthening Europe's data analytics capacity

- -01: Methods for exploiting data and knowledge for extremely precise outcomes (analysis, prediction, decision support), reducing complexity and presenting insights in understandable way (RIA)
- -05: Extreme data mining, aggregation and analytics technologies and solutions (RIA)

From Cloud to Edge to IoT for European Data

- -02: Cognitive Cloud: AI-enabled computing continuum from Cloud to Edge (RIA)
- -03: Programming tools for decentralised intelligence and swarms (RIA)

	ToA	Budget (M€)	EU contr (M€)	Nr of projects
-04	IA	52	10-13	4
-01	RIA	33	8-12	3
-05	RIA	30	5	6
-02	RIA	50	4-6	10
-03	RIA	40	4-8	5

Cluster 4

Destination 4

DIGITAL-EMERGING

Digital and emerging technologies for competitiveness and fit for the green deal

SECTIONS	NUMBER OF TOPICS		ESTIMATED BUDGET (M€)	
	2021	2022	2021	2022
Ultra-low power processors	2	1	28	22
European Innovation Leadership in Electronics	1	1	35	3
European Innovation Leadership in Photonics	2	1	65	48
6G and foundational connectivity technologies	1	2	3	26
Innovation in AI, Data and Robotics	2	1	49	19
Tomorrow's deployable Robots: efficient, robust, safe, adaptive and trusted	2	2	56	64.5
European leadership in Emerging Enabling Technologies	3	1	42	17.5
Flagship on Quantum Technologies: a Paradigm Shift	11	6	84.9	143.6
Graphene: Europe in the lead		5		43.5
TOTAL estimated budget WP 2021-2022	24	20	362.9	387.1

KDT JU: 460 MEUR, SNS JU: 243 MEUR

Cluster 4

Quantum calls

HORIZON-CL4-2021-DIGITAL-EMERGING-02

Flagship on Quantum Technologies: a Paradigm Shift

- 10: Strengthening the quantum software ecosystem for quantum computing platforms (RIA)
- 15: Framework Partnership Agreement for developing the first large-scale quantum computers (FPA)
- 16: Basic Science for Quantum Technologies (RIA)
- 17: Framework Partnership Agreement for developing large scale quantum simulation platform technologies (FPA)
- 19: Framework Partnership Agreements in Quantum Communications (FPA)
- 20: Quantum sensing technologies for market uptake (IA)
- 22: Framework Partnership Agreements for open testing and experimentation and for pilot production capabilities for quantum technologies (FPA)

HORIZON-CL4-QUANTUM-XX-SGAs

(Other Actions) Flagship on Quantum Technologies: a Paradigm Shift

- 01-SGA - Developing the first large-scale quantum computers (SGA)
- 02-SGA - Developing large scale quantum simulation platform technologies (SGA)
- 03-SGA - Building the Quantum Internet (SGA)
- 04-SGA - Quantum encryption and future quantum network technologies (SGA)
- 05-SGA - Supporting open testing and experimentation for quantum technologies in Europe (SGA)
- 06-SGA - Supporting experimental production capabilities for quantum technologies in Europe (SGA)

51 MEur

	ToA	Budget (M€)	EU contribution (M€)	Nr of projects	Call period
-10	RIA	12	5-7	2	2-Nov to 27 Jan 2022
-15	FPA				2-Nov to 27 Jan 2022
-16	RIA	16	2-3	5	2-Nov to 27 Jan 2022
-17	FPA				2-Nov to 27 Jan 2022
-19	FPA				2-Nov to 27 Jan 2022
-20	IA	23	7-10	3	2-Nov to 27 Jan 2022
-22	FPA				2-Nov to 27 Jan 2022

143.6 MEur

	ToA	Budget (M€)	EU contribution (M€)	Nr of projects	Call period
-01-	SGA (15)	40	18-20	2	2022 Q2-3
-02-	SGA (17)	16.6	16.6	1	2022 Q2-3
-03-	SGA (19)	24	24	1	2022 Q2-3
-04-	SGA (19)	25	25	1	2022 Q2-3
-05-	SGA (22)	19	19	1	2022 Q2-3
-06-	SGA (22)	19	19	1	2022 Q2-3

Cluster 4

Call HORIZON-CL4-2022-DIGITAL-EMERGING-01,
open until 5 April 2022

Ultra-low power processors

- -26: Open source for cloud-based services (RIA)

European Innovation Leadership in Electronics

- -38: International cooperation in semiconductors (CSA)

European Innovation Leadership in Photonics

- -03: Advanced multi-sensing systems (RIA)

6G and foundational connectivity technologies

- -30: European Enabling technologies for Beyond 5G/6G RAN disaggregated architectures (RIA)
- -39: Ultra low energy and secure networks (RIA)

European leadership in Emerging Enabling Technologies

- -35: Advanced characterisation methodologies to assess and predict the health and environmental risks of nanomaterials (RIA)

	ToA	Budget (M€)	EU contr (M€)	No of projects
-26	RIA	22	4-6	4
-38	CSA	3	3	1
-03	RIA	48	3-5	10
-30	RIA	13	13	1
-39	RIA	13	13	1
-35	RIA	17.5	2-3	5

Cluster 4

Call HORIZON-CL4-2022-DIGITAL-EMERGING-02,
open until 16 November 2022

Innovation in AI, Data and Robotics

- -05: AI, Data and Robotics for Industry optimisation (incl. production and services) (IA)

Tomorrow's deployable Robots: efficient, robust, safe, adaptive and trusted

- -06: Pushing the limit of physical intelligence and performance (RIA)
- -07: Increased robotics capabilities demonstrated in key sectors (IA)

Graphene: Europe in the lead

- -17: New generation of advanced electronic and photonic 2D materials-based devices, systems and sensors (RIA)
- -18: 2D materials-based devices and systems for energy storage and/or harvesting (RIA)
- -19: 2D materials-based devices and systems for biomedical applications (RIA)
- -20: 2D-material-based composites, coatings and foams (IA)
- -22: Supporting the coordination of the Graphene Flagship projects (CSA)

	ToA	Budget (M€)	EU contr. (M€)	No of projects
-05	IA	19	3-5	5
-06	RIA	28.5	4	7
-07	IA	36	6	6
-17	RIA	16.5	16.5	1
-18	RIA	9	9	1
-19	RIA	6	6	1
-20	IA	9	9	1
-22	CSA	3	3	1

Other relevant topics?

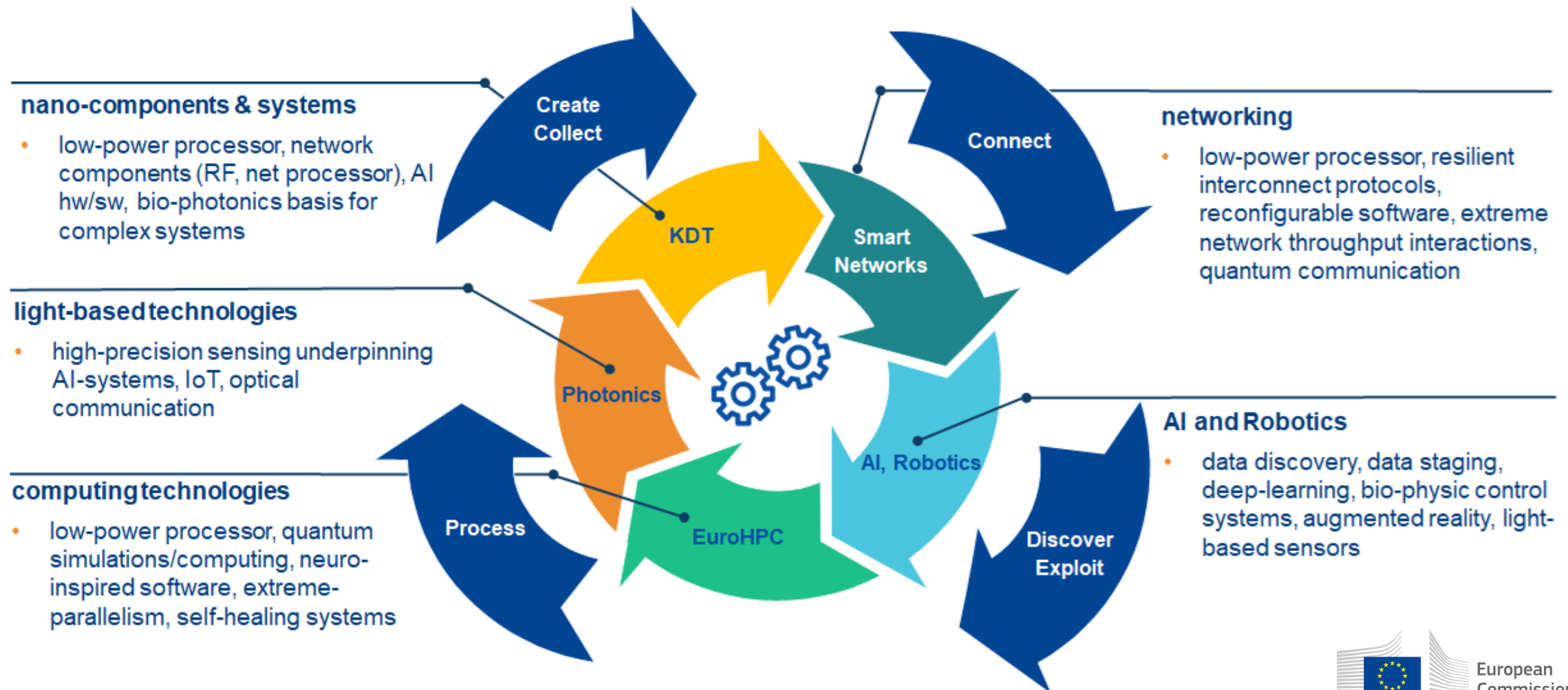
Example:

- **HORIZON-CL4-2022-RESILIENCE-01-10: Innovative materials for advanced (nano)electronic components and systems (RIA)**

Have a look at other parts of Horizon Europe!

Digital-centric partnerships

Interplay



49 European Partnerships

HEALTH (8)

- EU-Africa Global Health
- Innovative Health Initiative
- *Chemicals Risk Assessment*
- *ERA for Health research*
- *Health and Care Systems Transformation*
 - *Personalised Medicine*
 - *Rare Diseases*
- *One Health/AMR Antimicrobial Resistance (AMR)*

DIGITAL, INDUSTRY AND SPACE (10)

- High Performance Computing
- Key Digital Technologies
- Smart Networks and Services
 - AI, data and robotics
 - Photonics
- *Clean Steel - Low Carbon Steelmaking*
 - *European Metrology (Art 185)*
 - *Made in Europe*
 - *Processes4Planet*
- *Global competitive space systems*

PILLAR III AND CROSS-PILLAR (12)

- *Climate KIC*
- *Cultural and creative industries KIC*
- *Digital KIC*
- *Food KIC*
- *Health KIC*
- *InnoEnergy KIC*
- *Manufacturing KIC*
- *Raw Materials KIC*
- *Urban Mobility KIC*
- *Innovative SMEs*
- *European Open Science Cloud (EOSC)*
- *Pandemic Preparedness and Societal Resilience*

Underline = Institutionalised Partnership
***Italic* = Co-funded Partnership**

CLIMATE, ENERGY AND MOBILITY (11)

- Transforming Europe's Rail System
- Integrated Air Traffic Management
 - Clean Aviation
 - Clean Hydrogen
 - *Built4People*
- *Towards zero-emission road transport*
 - *Connected and Automated Driving*
 - *Zero-emission waterborne transport*
 - *Batteries*
- *Driving urban transitions to a sustainable future*
 - *Clean Energy Transition*

FOOD, BIOECONOMY, NATURAL RESOURCES, AGRICULTURE AND ENVIRONMENT (8)

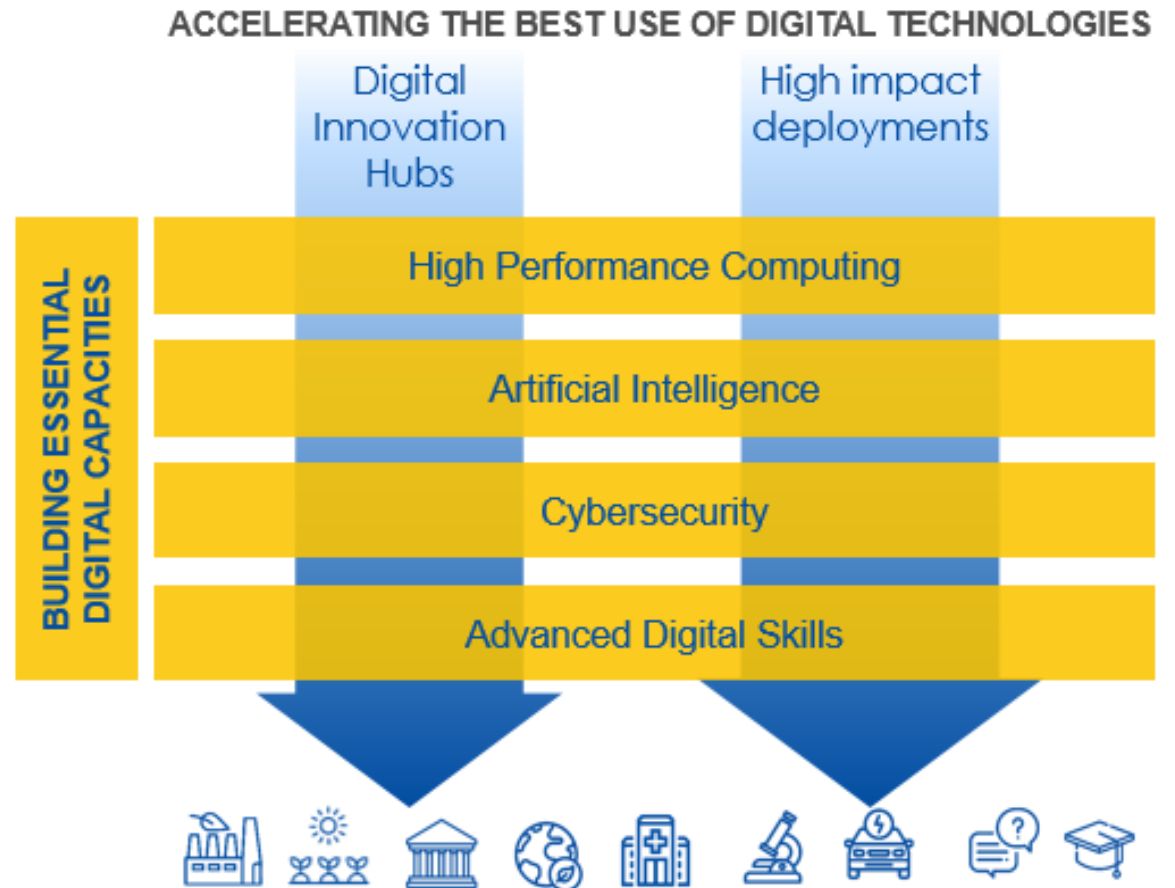
- *Accelerating farming systems transition*
 - *Animal Health and Welfare*
 - *Agriculture of data*
- *Rescuing biodiversity to safeguard life on Earth*
- *A climate neutral, sustainable and productive Blue Economy*
 - *Safe and Sustainable Food Systems*
 - Circular Bio-based Europe
- *Water4All: Water security for the planet*

Digital Europe Programme

To **ensure that Europe drives the digital transformation** of the economy and society and brings its benefits to all citizens and businesses.

Focus on:

- Building **essential capacities and advanced skills** in digital technologies, contributing to **Europe's strategic autonomy**;
- **Accelerating deployment** and best use in areas of public interest and the private sector



Testing and Experimentation Facility for Edge AI



SMART MOBILITY



SMART AGRI-FOOD



SMART HEALTH



SMART INDUSTRY

TEF FOR AI CHIPS (NEUROMORPHIC)

TECHNOLOGIES FOR LARGE SCALE TESTING AND EXPERIMENTATION FACILITIES (TEF)

→ **EDGE AI:** AI Chips / “Neuromorphic” chips

- **Neuromorphic** technology: mimics brain with hardware neural network, 1000x more efficient than standard HW+SW
- EU → **world player** expertise and supply
- **Major initiative:** infrastructure facilities to design, test, experiment and validate for industrial use.
- Level of **ambition** and the role of technology providers → joint MS/EC effort

Deadline 22 Feb 2022, 78 M€, single project, Grant for procurement (50% co-funding rate)



Industrial Alliance for Processors and Semiconductor Technologies



Industrial Alliance
for Processors and
Semiconductor Technologies

Objective

Maintain and boost competitiveness in the sector in the EU

Tasks

A. Planning and Analysis

- ✓ Identify gaps, bottlenecks, dependencies
- ✓ Develop strategic roadmap

B. Increase design capacity and manufacturing production in EU:

- ✓ Define a roadmap to reach advanced nodes
- Two parallel targets: 16-10nm and 5nm to 2nm

C. Foster investment and synergies

Member States' platform to enhance coherence and synergies across activities in the IPCEI, the KDT JU, DEP and the Pact for Skills

Launch

- **Launched** July 19th 2021: publication of Terms of Reference (ToR), Declaration, and Application Form
- Applications always open, no deadline

Digital Europe call

- **DIGITAL-2021-CLOUD-AI-01-DATA-TECH - Secretariat for the alliance on processors and semiconductor technologies (CSA)**, 1 M€, deadline 22 February 2022
- **Info session on 26 January 2022**

12.6



European
Commission

How does it all fit?

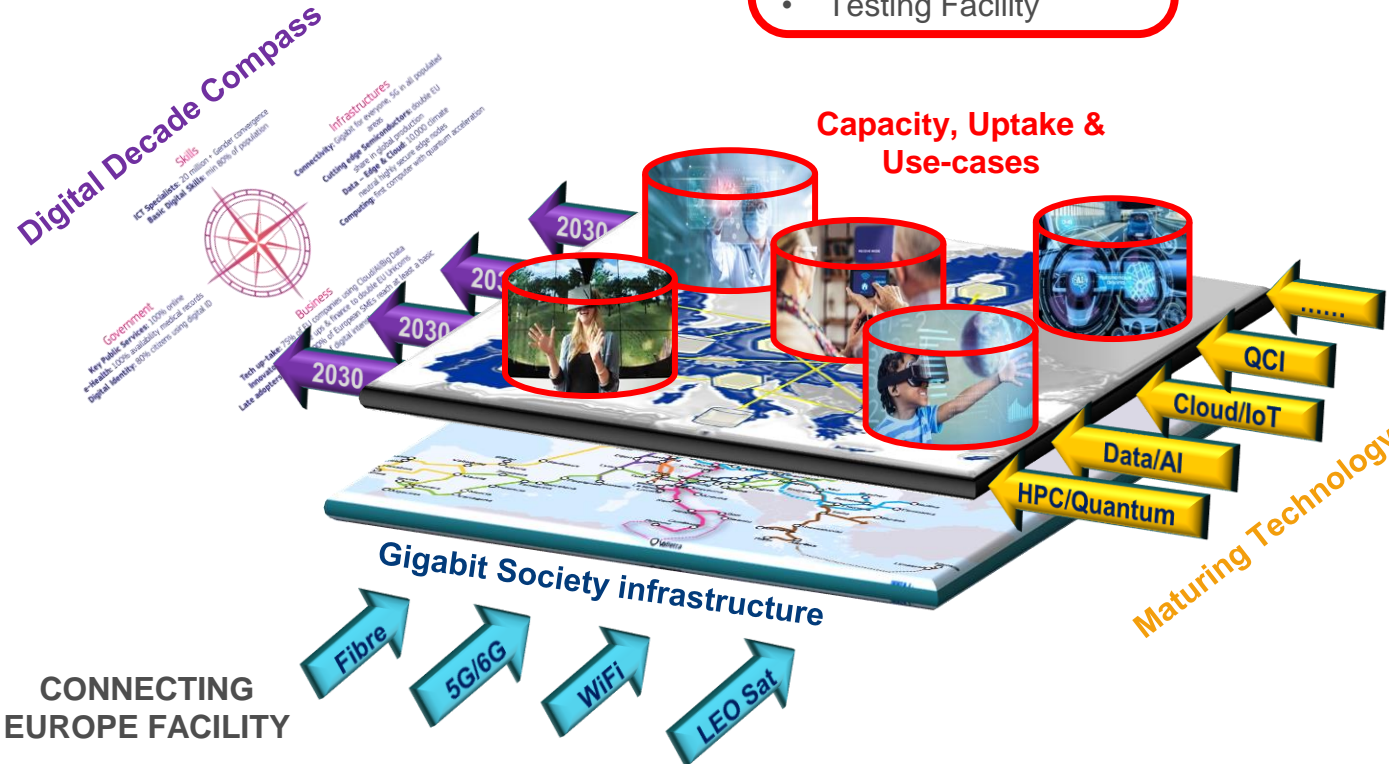
Complemented by
Structural Funds,
InvestEU, RRP
efforts, IPCEI...

DIGITAL EUROPE

- EU-Wide deployment
- Strategic capacities
- Advanced digital skills
- Testing Facility

HORIZON EUROPE

- Preparing/maturing technology & progress (AI/Quantum...)
- By-design regulatory compliance (e.g. privacy friendly, unbiased AI)
- Leading & best in-class (e.g. strategic open autonomy, quantum)
- Prosperity, people & planet lens (green tech, societal challenges, industrial lead...)



CONNECTING EUROPE FACILITY

- Strategic Backbones
- Fixed + Wireless Connectivity

Towards a new IPCEI on Microelectronics

- Strengthen capabilities in design and increase autonomy and resilience of EU semiconductor value chains
- Primary focus on digital - data processing and communication with power efficiency / sustainability
- Pre-notification just before Christmas 2021
 - 20 Member States participating
 - 100+ companies directly involved

For more information

- Cluster 4 Info Days on 29-30 Nov & 1 Dec 2021:
- [Cluster 4 - Digital, Industry & Space | European Commission \(europa.eu\)](#)
- Participants portal - Funding & tender opportunities:
- [Funding & tenders \(europa.eu\)](#)
- Info session DEP calls on secretariats for Industrial Alliances
- [January 26, 12.00-13.00 CET](#)



Thank you for your attention!

Any questions?

