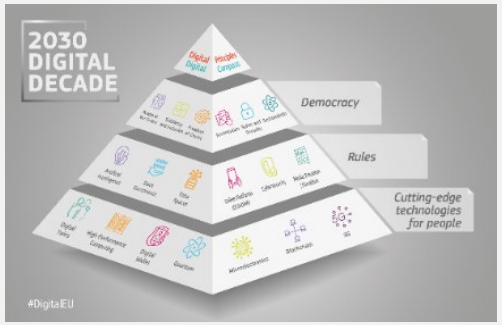
Cluster 4
Digital, Industry and Space

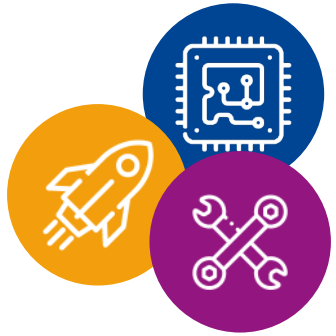
European Commission

Destination	Strategies	
Climate-neutral, Circular and Digitised production TWIN-TRANSITION – EUR 634M KSO C	Fit for 55 Digital Decade Industrial Strategy Update Climate Action: 42.8% of budget REPowerEU: ~EUR 250M of new investment for energy-independence	
A digitised, resource efficient, and resilient industry RESILIENCE – EUR 587M KSO A	Fit for 55 EU Chemical Strategy Industrial Strategy Update	
World-leading data and computing technologies DATA – EUR 161M KSO A	European Data Strategy Digital Decade Industrial Strategy Update A European approach to artificial intelligence Chips Act Digital Agenda: 50.5% of budget	
Digital and Emerging technologies DIGITAL-EMERGING – EUR 487M KSO A		
Open Strategic Autonomy in Space infrastructures, services, applications and data SPACE – EUR 486M KSO A	EU Space Strategy	
A human-centred and ethical development of digital and industrial technologies HUMAN – EUR 318M KSO D	Digital Decade A European approach to artificial intelligence Industrial Strategy Update	

Synergies foreseen with other funding programmes/work programme parts:

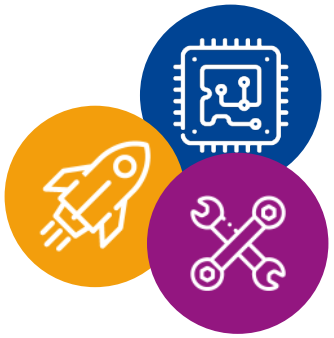
- 5 co-programmed partnerships
- KDT (future Chips) JU
- EuroHPC JU
- SNS JU
- Metrology (Art. 185)
- Synergies with all other Clusters
- Synergies with Innovation Fund, ERDF, ESF+, InvestEU, …

Main horizontal policy priorities addressed:



Budget: EUR 1 591 million in 2023 and EUR 1 118 million in 2024 (+ JUs)

Italy's participations in Cluster 4, 2021-22 (excludes late 2022 calls):



CALL (2021 and 2022 combined)	Proposals	Selected Proposals	Funding for IT, M€	IT Participations	Selected IT Participations
TWIN-TRANSITION	369	67	92.6	1079	214
RESILIENCE	471	83	65.1	1105	173
DATA	215	34	35.4	520	89
DIGITAL-EMERGING	251	60	54.2	511	114
SPACE	61	28	23.9	120	52
HUMAN	167	30	29.0	350	65
TOTAL	**1534**	**302**	**300.4**	**3685**	**707**

European Commission

Destination 1 – Climate-neutral, circular and digitised production

- Manufacturing Industry - **Made in Europe** Partnership
  - Advanced manufacturing as a key enabling technology
  - From smart factories to regenerative factories, incl. bio-intelligent manufacturing
  - Systemic approach: from smart factories to smart value loops – e.g. support to digital product passport
  - Data-driven technologies, Manufacturing-As-A-Service
- Construction
  - Digitisation and circularity for buildings - synergies with Bauhaus, Built4People
- Energy-efficient and Climate-neutral Industries - **Processes 4 Planet** and **Clean Steel** Partnerships
  - Energy Efficiency and Climate Neutrality - **REPowerEU**
  - Circularity / Zero-pollution (air, soil and water)
  - Hubs for Circularity – place-based innovation between industry, regions and cities
  - Synergies with: Mission Innovation 2.0 / ETS Innovation Fund / Coal and Steel Fund

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

Manufacturing Industry

- HORIZON-CL4-2023-TWIN-TRANSITION-01-02: High-precision OR complex product manufacturing – potentially including the use of photonics (Made in Europe and Photonics Partnerships) (IA) (Lump sum)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-04: Factory-level and value chain approaches for remanufacturing (Made in Europe Partnership) (IA)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-07: Achieving resiliency in value networks through modelling and Manufacturing as a Service (Made in Europe Partnership) (RIA)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-08: Foresight and technology transfer for Manufacturing As A Service (Made in Europe Partnership) (CSA) (Lump sum)

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

Energy efficient and climate neutral process industries" (Energy Intensive Process Industries)

- HORIZON-CL4-2023-TWIN-TRANSITION-01-31: Energy efficiency breakthroughs in the process industries (Processes4Planet partnership) (RIA) (Lump sum)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-33: Electrification of high temperature heating systems (Processes4Planet Partnership) (IA)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-36: Modelling process industry transition to climate neutrality, sustainability and circularity (Processes4Planet partnership) (RIA) (Lump sum)

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

Circularity and Zero Pollution in process industries

- HORIZON-CL4-2023-TWIN-TRANSITION-01-37: Hubs for circularity for near zero emissions regions applying industrial symbiosis and cooperative approach to heavy industrialized clusters and surrounding ecosystems (Processes4Planet partnership) (IA)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-40: Sustainable and efficient industrial water consumption: through energy and solute recovery (Processes4Planet partnership) (RIA)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-42: Circular economy in process industries: Upcycling large volumes of secondary resources (Processes4Planet partnership) (RIA) (Lump sum)

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

Clean Steel

- HORIZON-CL4-2023-TWIN-TRANSITION-01-43: Low carbon-dioxide emission technologies for melting iron-bearing feed materials OR smart carbon usage and improved energy & resource efficiency via process integration (Clean Steel Partnership) (IA)
- HORIZON-CL4-2023-TWIN-TRANSITION-01-45: Circular economy solutions for the valorisation of low-quality scrap streams, materials recirculation with high recycling rate, and residue valorisation for long term goal towards zero waste (Clean Steel Partnership) (RIA)

A new way to build, accelerating disruptive change in construction

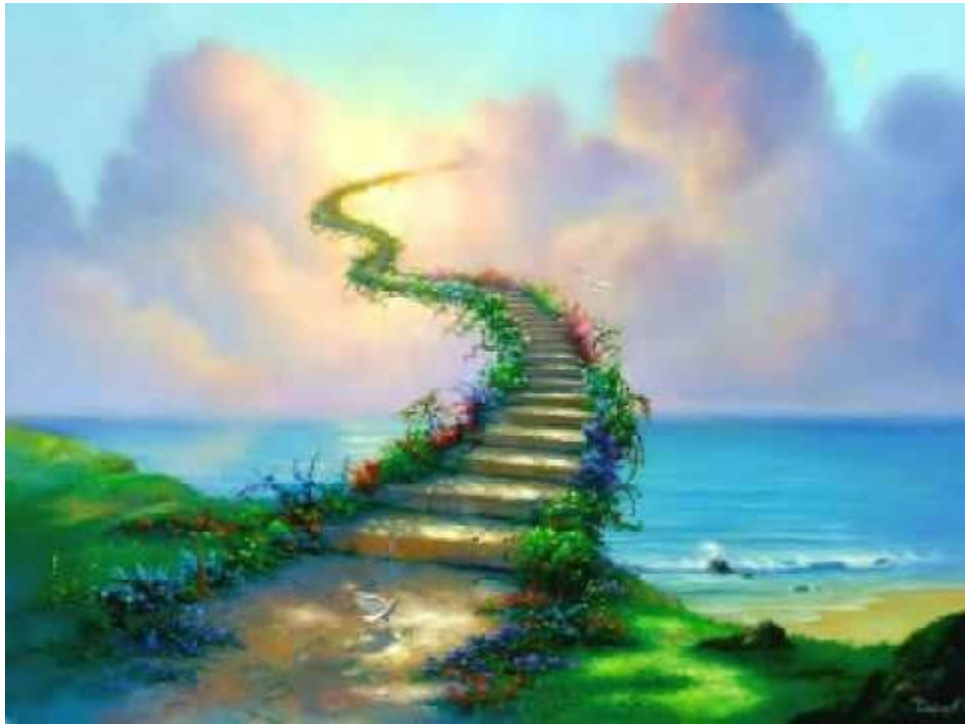
- HORIZON-CL4-2023-TWIN-TRANSITION-01-11: Intelligent data acquisition and analysis of materials and products in existing built works (RIA) (Lump sum) [Two-stage call]

Destination 2 – Increased autonomy in key strategic value chains for resilient industry

- Raw Materials
  - Sustainable / responsible exploration, extraction, processing, refining + *recycling*
  - European Raw Materials Alliance – focusing on Critical Raw Materials, e.g. rare earths
- Safe and Sustainable by Design (SSbD)
  - Implementing SSbD and Strategic Research and Innovation Plan for Chemicals and Materials (Chemicals Strategy) - framework and criteria for assessing safety and sustainability of chemicals and materials)
  - Toolboxes for Safe and Sustainable by Design Policy
- Strategic Innovation Markets driven by Advanced Materials
  - Implementing Materials 2030 Manifesto – covering nine innovation markets

Materials Innovation Markets – a Stairway to Heaven

- May 2021 - Materials Roundtable Commissioner Gabriel and key-leaders in materials R&I at the Portuguese Presidency conference 'Euro-nanoforum'
- January 2022 – signature 'Materials 2030 Manifesto'
- June 2022 – 'Materials 2030 Roadmap' presented and discussed at French Presidency conference 'IndTech'
- The Materials 2030 Roadmap:
  - presents detail of 9 Materials Innovation Markets including prioritisation and socio-economic benefits;
  - calls for '*The Materials 2030 Initiative for planet, people, and prosperity*'
  - plans for next steps until 2023



Strategic innovation markets driven by advanced materials

Call - RESILIENT VALUE CHAINS 2023 TWO STAGE

- HORIZON-CL4-2023-RESILIENCE-01-32: Bioinspired and biomimetic materials for sustainable textiles (IA)
- HORIZON-CL4-2023-RESILIENCE-01-33: Smart sensors for the Electronic Appliances market (RIA) (Lump sum)
- HORIZON-CL4-2023-RESILIENCE-01-34: Advanced (nano and bio-based) materials for Sustainable Agriculture (RIA)
- HORIZON-CL4-2023-RESILIENCE-01-37: Advanced materials for magnets in applications for the New Energies Market (RIA)

Call - RESILIENT VALUE CHAINS 2023

- HORIZON-CL4-2023-RESILIENCE-01-39: Coordination and knowledge sharing across materials development communities (CSA) (Lump sum)

Safe and Sustainable by Design (SSbD) chemicals and materials

- HORIZON-CL4-2023-RESILIENCE-01-21: Innovative methods for safety and sustainability assessments of chemicals and materials (RIA)
- HORIZON-CL4-2023-RESILIENCE-01-22: Integrated approach for impact assessment of safe and sustainable chemicals and materials (RIA)
- HORIZON-CL4-2023-RESILIENCE-01-23: Computational models for the development of safe and sustainable by design chemicals and materials (RIA) (Lump sum)

Call – RESILIENT VALUE CHAINS 2023

Raw Materials

for EU open strategic autonomy and successful transition to a climate-neutral and circular economy

- HORIZON-CL4-2023-RESILIENCE-01-02: Innovative technologies for sustainable and decarbonised extraction (RIA) (Lump sum)
- HORIZON-CL4-2023-RESILIENCE-01-03: Technologies for processing and refining of critical raw materials (IA)
- HORIZON-CL4-2023-RESILIENCE-01-05: Recycling technologies for critical raw materials from EoL products (IA)
- HORIZON-CL4-2023-RESILIENCE-01-06: Earth Observation platform, products and services for raw materials (IA) (Lump sum)
- HORIZON-CL4-2023-RESILIENCE-01-07: Expert network on Critical raw materials (CSA) (Lump sum)
- HORIZON-CL4-2023-RESILIENCE-01-09: Recyclability and resource efficiency of Rare Earth based magnets (IA)

Call – RESILIENT VALUE CHAINS 2023

Improving the resilience and preparedness of EU businesses, especially SMEs and Startups

- HORIZON-CL4-2023-RESILIENCE-01-42: Boosting generation and diffusion of advanced technologies in SMEs based on a supply chain model (CSA) (Lump sum)
- HORIZON-CL4-2023-RESILIENCE-01-44: Affordable Housing District Demonstrator (IA)

Destination 6 – A human-centred and ethical development of digital and industrial technologies

- **Standardisation**
  - Pre-normative work ; Observatory on Standardisation; Funding experts; Education and training: Academy
- Systemic approaches for accelerating uptake of technology and innovation
  - Toolbox for efficient IP licensing for market uptake and societal value creation; Piloting communities of expert facilitators to improve industry-academia-public sector co-creation
- Research and Innovation for **Industry 5.0**
  - Increased uptake of the Industry 5.0 principles and practices across industrial sectors

European Commission

Industry topics in Destination 6

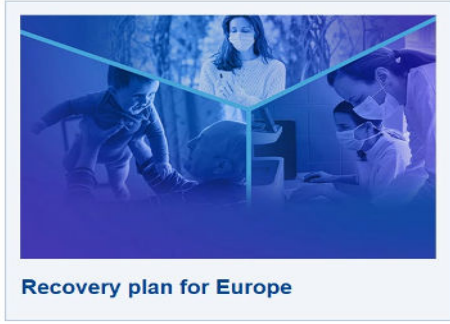
- **HORIZON-CL4-2023-DIGITAL-EMERGING-01-12: Adaptive multi-scale modelling and characterisation suites from lab to production (RIA)**

- **HORIZON-CL4-2023-HUMAN-01-31: Toolbox for efficient IP licensing for market uptake and societal value creation (CSA)**
- **HORIZON-CL4-2023-HUMAN-01-32: Piloting communities of expert facilitators to improve industry-academia-public sector co-creation (CSA)**
- **HORIZON-CL4-2023-HUMAN-01-33: Fostering knowledge valorisation through societal and cultural interactions (CSA)**

- **HORIZON-CL4-2023-HUMAN-01-51: Pilots for an innovative human-centric industry (RIA)**
- **HORIZON-CL4-2023-HUMAN-01-52: Drivers and success factors for progress towards Industry 5.0 (RIA)**
- **HORIZON-CL4-2023-HUMAN-01-53: Localised and Urban Manufacturing, supporting creativity and the New European Bauhaus (RIA using FSTP)**
- **HORIZON-CL4-2023-HUMAN-01-54: Green and digital skills and training needs for a just transition (CSA)**

- **HORIZON-CL4-2023-HUMAN-01-62: Boosting industrial symbiosis by standardisation (CSA)**
- **HORIZON-CL4-2023-HUMAN-01-63: Provide for a strong and sustainable pool of experts for European Standardisation: attract the students of university/HEI (CSA)**
- **HORIZON-CL4-2023-HUMAN-01-64: Pre-normative research and standardisation in industrial ecosystems (CSA)**

Cluster 4 ‘Digital, Industry and Space’ – Political Priorities



Action Plan on critical raw materials, Chemical Strategy for Sustainability, Circular Economy Action Plan – For a cleaner and more competitive Europe , European Space Strategy

European data strategy | European Commission (europa.eu)

A European approach to artificial intelligence | Shaping Europe’s digital future (europa.eu)

European Data Governance Act | Shaping Europe’s digital future (europa.eu)

Data Act | Shaping Europe’s digital future (europa.eu)

European Chips Act | European Commission (europa.eu)

Europe’s Digital Decade: digital targets for 2030 | European Commission (europa.eu)

European Commission

Overall Vision: 2030 Digital Decade

Digital Decade Communication
2030 Vision & Targets, Approach to delivery, Digital Principles

Empowering businesses and people in a human-centred, sustainable and more prosperous digital future

2030 digital decade targets for people, planet, prosperity

European Commission

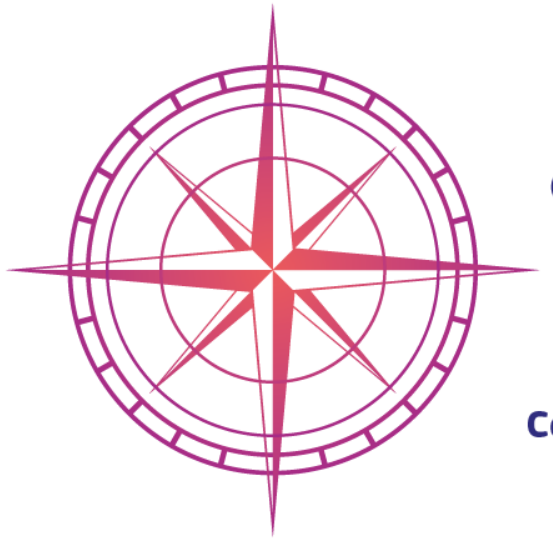
The 2030 Digital Compass

Skills

ICT Specialists: 20 million + Gender convergence
Basic Digital Skills: min 80% of population

Public Services

Key Public Services: 100% online
e-Health: 100% availability medical records
Digital Identity: 80% citizens using digital ID



Infrastructures

Connectivity: Gigabit for everyone, 5G everywhere
Cutting edge Semiconductors: double EU share in global production
Data – Edge & Cloud: 10,000 climate neutral highly secure edge nodes
Computing: first computer with quantum acceleration

Business

Tech up-take: 75% of EU companies using Cloud/AI/Big Data
Innovators: grow scale ups & finance to double EU Unicorns
Late adopters: more than 90% of European SMEs reach at least a basic level of digital intensity

European Commission

Policy Programme: a Path to the Digital Decade
Multi-Country Projects

- ✓ **Multi-country projects** are large scale projects for:
  - ✓ the achievement of the targets for the digital transformation of the Union;
  - ✓ and industrial recovery.
- ✓ They will **pool EU, national, and private resources** to achieve progress that no Member State could do on its own.

Multi-country projects will facilitate investments in areas like:

High-performance computing

Common data infrastructure and services

Blockchain

Low-power processors

Pan-European deployment of 5G corridors

High-tech partnerships for digital skills

Secure quantum infrastructure and network of cybersecurity centres

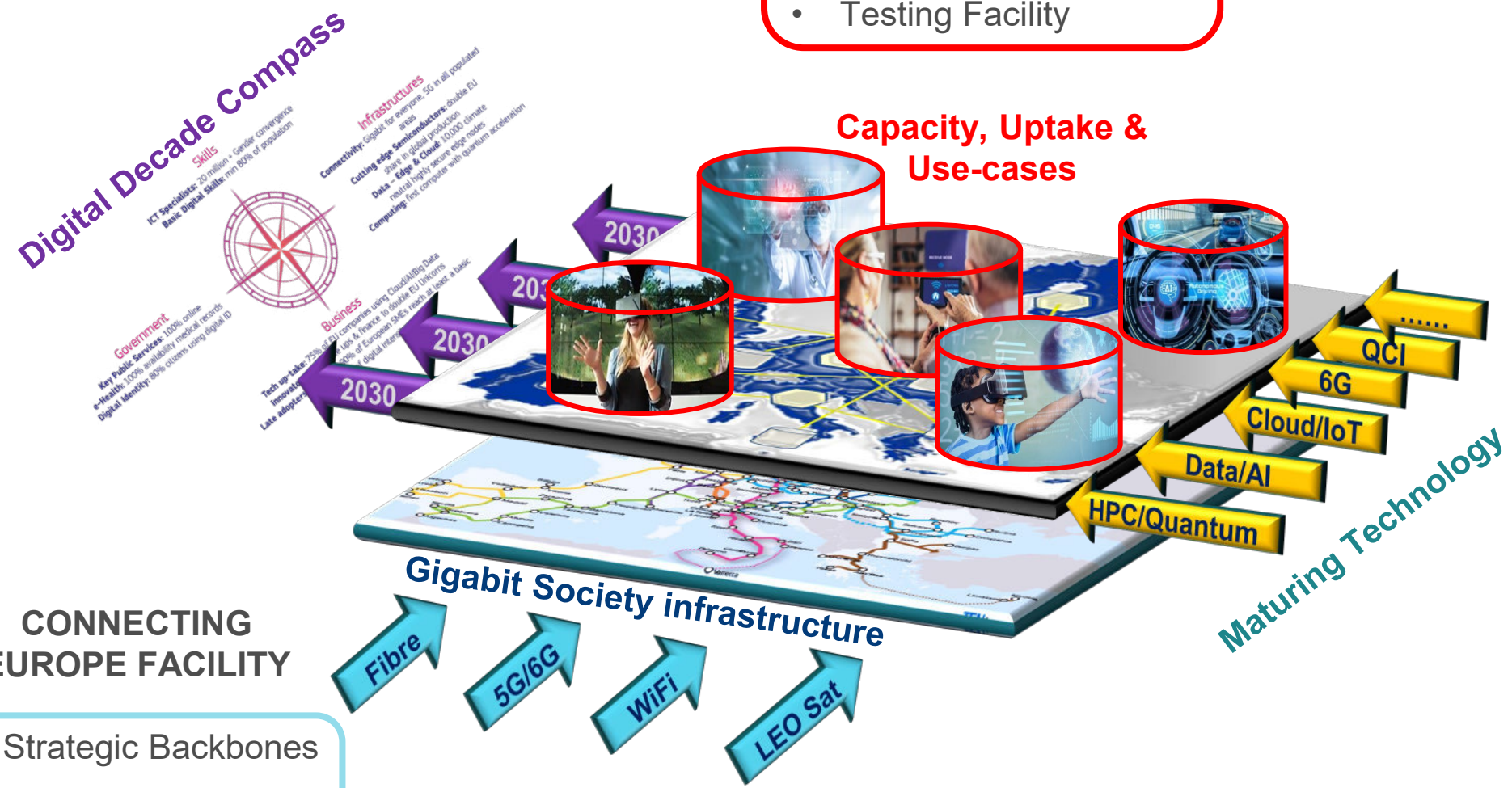
Digital public administration

Digital innovation hubs

European Commission

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...)

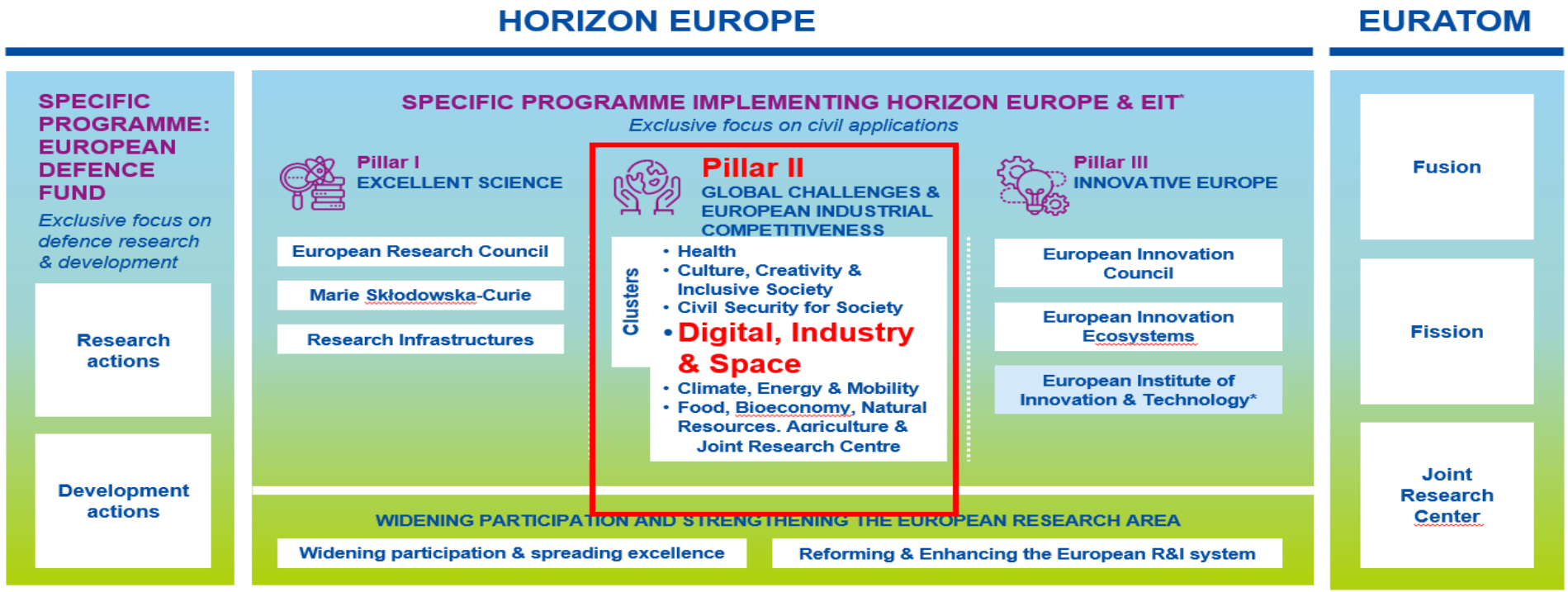
CONNECTING EUROPE FACILITY

- Strategic Backbones
- Fixed + Wireless Connectivity

European Commission

Overall Vision: 2030 Digital Decade

- **Ultimate goal = 2030 digital decade targets** for people, planet, prosperity
- **Digital in Horizon Cluster 4 = sector agnostic technology** with as much as possible by-design compliance (privacy, ethical, trustworthy, planet friendly…) + **Partnerships**



Cluster 4 – Intended Impact & Destinations

Strategic Plan (2021-2024) and Orientations	→→→→	**Destinations**
Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy		1. Climate neutral, circular and digitised production TWIN-TRANSITION
Promoting an open strategic autonomy by leading the development of key digital, and enabling and emerging technologies, sectors and value chains		2. A digitised, resource efficient, and resilient industry - RESILIENCE **3. World-leading data and computing technologies - DATA** **4. Digital and emerging technologies for competitiveness and fit for the green deal - DIGITAL-EMERGING** 5. Open Strategic Autonomy in developing, deploying and using global space-based infrastructures, services, applications and data - SPACE
Creating a more resilient, inclusive and democratic European society		**6. A human-centred and ethical development of digital and industrial technologies - HUMAN**

European Commission

Digital: synergies

- **Sectorial applications in clusters:** **Health** (augmented medicine, human-machine interactions, health data cloud…), **Cyber** (AI-based security, secure IoT, Crypto...), **Culture, Creative & Inclusive Society** (disinformation, digital democracy, cultural heritage…)

- **Digital Europe & CEF (digital):** informed by Research for uptake/deployment, often around **flagship areas/multi-country technology projects**.

- **Further synergies for uptake/deployment on case-by-case:** InvestEU (Green ICT, Connectivity…), Structural Funds, Resilience & Recovery Facility, IPCEI…

Partnerships in Cluster 4

- Processes4Planet – Transforming the European Process Industry for a sustainable society (1,300M€)
- Clean Steel – Low-carbon Steelmaking (700M€)
- **Made in Europe** (900M€)
- **EuroHPC, High-Performance Computing (JU, 900M€)**
- **KDT, Key Digital Technologies (JU, 1,800M€)**
- **SNS, Smart Networks and Services (JU, 900M€)**
- **Artificial Intelligence, Data and Robotics (1,300M€)**
- **Photonics (340M€)**
- Globally competitive Space Systems (proposed)
- Metrology (Art. 185, 300M€)

Climate neutral, circular, and digitised production 2023-2024

SECTIONS (MOST DIGITAL RELATED)	NUMBER OF TOPICS	ESTIMATED BUDGET (M€)
Manufacturing industry	6	189.6

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

HORIZON-CL4-2023-TWIN-TRANSITION-01

81 MEur

Manufacturing industry

-02: High-precision OR complex product manufacturing – potentially including the use of photonics (Made in Europe and Photonics Partnerships) (IA)

-07: Achieving resiliency in value networks through modelling and Manufacturing as a Service (Made in Europe Partnership) (RIA)

- 08: Foresight and technology transfer for Manufacturing as a Service (Made in Europe Partnership) (CSA)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-02	IA	48	5-6	8	01-Dec 2022 to 20-Apr 2023
-07	RIA	32	4-6	6	01-Dec 2022 to 20-Apr 2023
-08	CSA	1	1	1	01-Dec 2022 to 20-Apr 2023

World leading Data and Computing Technologies 2023-2024

SECTIONS	NUMBER OF TOPICS	ESTIMATED BUDGET (M€)
Data sharing in the common European data spaces	3 (incl. 1 CSA)	84
From Cloud to Edge to IoT for European Data	4 (incl. 2 CSAs)	77
TOTAL estimated	***7***	***161***

EuroHPC JU: 254 MEUR

European Commission

Call - WORLD LEADING DATA AND COMPUTING TECHNOLOGIES 2023

HORIZON-CL4-2023-DATA-01

76 MEur

Data sharing and analytics capacity

-02: Integration of data life cycle, architectures and standards for complex data cycles and/or human factors, language (AI, data and robotics partnership) (RIA)
-07: Collaboration with NSF on fundamental research on new concepts for distributed computing and swarm intelligence (CSA)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-02	RIA	45	9	5	01-Dec 2022 to 29-March 2023
-07	CSA	1	1	1	01-Dec 2022 to 29-March 2023

From Cloud to Edge to IoT for European Data

-04: Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (AI, data and robotics partnership) (RIA)
-06: Coordination and Support of Cognitive Computing Continuum research and policy (CSA)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-04	RIA	28	4-6	6	01-Dec 2022 to 29-March 2023
-06	CSA	2	2	1	01-Dec 2022 to 29-March 2023

Digital and emerging technologies for competitiveness and fit for the green deal 2023-2024

SECTIONS	NUMBER OF TOPICS	ESTIMATED BUDGET (M€)
AI, Data and Robotics (incl. efficient, robust, safe, adaptive and trusted robots)	4	150
European Leadership in Emerging and Enabling Technologies	2	57
European Innovation Leadership in Photonics	6 (incl. 1 CSA)	93
Graphene and 2D materials: Europe in the lead	4 (incl. 1 CSA)	54
Flagship on Quantum Technologies: a Paradigm Shift	7 (1 SGAs)	97
Open Source for Cloud/Edge and Software Engineering Fundamentals to support Digital Autonomy	3 (incl. 1 CSA)	35,5
TOTAL estimated	***26***	***486,5***

KDT JU: 590 MEUR, SNS JU: 265 MEUR

European Commission

Call - Digital and emerging technologies for competitiveness and fit for the green deal - 2023

HORIZON-CL4-2023-DIGITAL-EMERGING-01

108 MEur

AI, Data and Robotics (incl. efficient, robust, safe, adaptive and trusted robots)

-01: Novel paradigms and approaches, towards AI-driven autonomous robots (AI, data and robotics partnership) (RIA)

European leadership in Emerging Enabling Technologies

-12: Adaptive multi-scale modelling and characterisation suites from lab to production (RIA)

European Innovation Leadership in Photonics

-51: Pervasive photonics - multi-technology integration for digital infrastructure, sensors and internet of things (Photonics partnership)(RIA)
-53: Versatile light sources and systems as tools for manufacturing and medical application (Photonics Partnership) (RIA)
- 57: Advanced imaging and sensing technologies (IA)(Photonics Partnership)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-01	RIA	30	8	4	01-Dec 2022 to 29-March 2023
-12	RIA	22	5-7	4	01-Dec 2022 to 29-March 2023
-51	RIA	18	3-5	4	01-Dec 2022 to 29-March 2023
-53	RIA	18	3-5	4	01-Dec 2022 to 29-March 2023
-57	IA	20	5-7	4	01-Dec 2022 to 29-March 2023

Call - Digital and emerging technologies for competitiveness and fit for the green deal - 2023

HORIZON-CL4-2023-DIGITAL-EMERGING-01-CNECT

154 MEur

AI, Data and Robotics (incl. efficient, robust, safe, adaptive and trusted robots)

-02: Industrial leadership in AI, Data and Robotics – advanced human robot interaction (AI Data and Robotics Partnership) (IA)

European leadership in Emerging Enabling Technologies

-11: Low TRL research in micro-electronics and integration technologies for industrial solutions (RIA)

Graphene and 2D materials: Europe in the lead

-32: Sustainable safe-by-design 2D materials technology (RIA)
-33: 2D materials of tomorrow (RIA)
-17: Framework Partnership Agreement for developing large scale quantum simulation platform technologies (FPA)
-19: Framework Partnership Agreements in Quantum Communications (FPA)

Flagship on Quantum Technologies: a Paradigm Shift

-40: Quantum Photonic Integrated Circuit technologies (RIA)
-41: Investing in alternative quantum computation and simulation platform technologies (RIA)
-43: Framework Partnership Agreement for developing large-scale quantum Computing platform technologies (FPA)
-50: Next generation quantum sensing and metrology technologies (RIA)

European Innovation Leadership in Photonics

-56: Photonic Strategies and Skills Development (CSA) (Photonics Partnership)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-02	IA	30	10	3	01-Dec 2022 to 29-March 2023
-11	RIA	35	3-4	10	01-Dec 2022 to 29-March 2023
-32	RIA	6	3-5	2	01-Dec 2022 to 29-March 2023
-33	RIA	12	3-4	3	01-Dec 2022 to 29-March 2023
-40	RIA	12	4-6	2	01-Dec 2022 to 29-March 2023
-41	RIA	20	7-12	2	01-Dec 2022 to 29-March 2023
-43	FPA			0	01-Dec 2022 to 29-March 2023
-50	RIA	10	2-3	3	01-Dec 2022 to 29-March 2023
-56	CSA	4	1-3	2	01-Dec 2022 to 29-March 2023

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

-02- SGA- Developing large-scale quantum Computing platform technologies (SGA)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-02-SGA	SGA	25	25	1	2nd quarter of 2024

Article 22(5) – Application 2023 topics

High TRL Quantum Technologies

Participation is limited to legal entities established in Member States, Iceland, Norway, Israel

- HORIZON-CL4-2023-DIGITAL-EMERGING-01-40: Quantum Photonic Integrated Circuit technologies (RIA)
- **HORIZON-CL4-2023-DIGITAL-EMERGING-01-41: Investing in alternative quantum computation and simulation platform technologies (RIA)**
- **HORIZON-CL4-2023-DIGITAL-EMERGING-01-43: Framework Partnership Agreement for developing large-scale quantum Computing platform technologies (FPA)**
- **02- SGA- Developing large-scale quantum Computing platform technologies (SGA)**

Low TRL Quantum Technologies

Participation is limited to legal entities established in Member States, associated countries, OECD and Mercosur countries

- **HORIZON-CL4-2023-DIGITAL-EMERGING-01-50: Next generation quantum sensing and metrology technologies (RIA)**

European Commission

A human-centred and ethical development and industrial technologies 2023-2024

SECTIONS	NUMBER OF TOPICS	ESTIMATED BUDGET (M€)
European standards for industrial competitiveness	6 (all CSAs)	23
International cooperation	3 (all CSAs)	6,5
Leadership in AI based on trust	7 (incl. 1 CSA)	143
An Internet of Trust	4 (incl. 1 CSAs)	47
eXtended Reality (XR)	3 (incl. 1 CSA)	53
Digital Humanism and human compatible technologies	2 (all CSAs)	4,5
Systemic approaches for accelerating uptake of technology and innovation incl. NCP Network(s) for Cluster 4 (Digital, Industry, Space)	4 (all CSAs)	14
Research and Innovation for Industry 5.0	4 (incl. 1 CSA)	26,5
TOTAL estimated	***33***	***317,5***

Call - A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL TECHNOLOGIES 2023

HORIZON-CL4-2023-HUMAN-01

9 MEur

Research and Innovation for Industry 5.0

- 54: Green and digital skills and training needs for a just transition (CSA)

International Cooperation

-91: International Hub for Digital Partnerships in the Indo-Pacific (CSA)
-92: R&I cooperation with Sub-Saharan Africa (CSA)
-93: R&I cooperation with Latin America (Mexico, Brazil, Argentina, and other countries in the BELLA network or members of RedClara) (CSA)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-54	CSA	2.5	0.5	5	01-Dec 2022 to 29-March 2023
-91	CSA	2.5	2.5	1	01-Dec 2022 to 29-March 2023
-92	CSA	2	2	1	01-Dec 2022 to 29-March 2023
-93	CSA	2	2	1	01-Dec 2022 to 29-March 2023

Call - A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL TECHNOLOGIES 2023

HORIZON-CL4-2023-HUMAN-01-CNECT

200.5MEur

Leadership in AI based on trust

-01: Efficient trustworthy AI - making the best of data (AI, Data and Robotics Partnership) (RIA)
-02: Large Scale pilots on trustworthy AI data and robotics addressing key societal challenges (AI Data and Robotics Partnership) (IA)
-03: Natural Language Understanding and Interaction in Advanced Language Technologies (AI Data and Robotics Partnership) (RIA)
-04: Open innovation: Addressing Grand challenges in AI (AI Data and Robotics Partnership) (CSA)
-05: Through AI from Disinformation to Trust (IA)

An Internet of Trust

-11: Next Generation Internet Fund (RIA)
-12: Pilots for the Next Generation Internet (IA)
-13: Next Generation Internet International Collaboration - USA (RIA)
-14: Next Generation Internet Commons Policy (CSA)

eXtended Reality (XR)

-21: Next Generation eXtended Reality (RIA)
-22: eXtended Reality for Industry 5.0 (IA)-25: eXtended Collaborative Telepresence (IA)
-23: Supporting the emergence of an open human-centric Metaverse (CSA)

European standards for industrial competitiveness

-65: Support facility for digital standardisation and international cooperation in digital partnerships (CSA)
-66: Promoting EU standards globally (CSA)

Digital Humanism and human compatible technologies

-81: Digital Humanism - Putting people at the centre of the digital transformation (CSA)
-82: Art-driven digital innovation: Towards human compatible and ecologically conscious technology (CSA)

	ToA	Budget (ME)	EU contribution (ME)	No of projects	Call period
-01	RIA	35	7-9	5	01-Dec 2022 to 29-March 2023
-02	IA	24	8	3	01-Dec 2022 to 29-March 2023
-03	RIA	20	6-8	3	01-Dec 2022 to 29-March 2023
-04	CSA	4	4	1	01-Dec 2022 to 29-March 2023
-05	IA	10	5	2	01-Dec 2022 to 29-March 2023
-11	RIA	27	27	1	01-Dec 2022 to 29-March 2023
-12	IA	13	3-5	5	01-Dec 2022 to 29-March 2023
-13	RIA	4	4	1	01-Dec 2022 to 29-March 2023
-14	CSA	2	2	1	01-Dec 2022 to 29-March 2023
-21	RIA	26	5-8	4	01-Dec 2022 to 29-March 2023
-22	IA	25	5-8	4	01-Dec 2022 to 29-March 2023
-23	CSA	2	2	1	01-Dec 2022 to 29-March 2023
-65	CSA	1.5	1.5	1	01-Dec 2022 to 29-March 2023
-66	CSA	1.5	2.5	1	01-Dec 2022 to 29-March 2023
-81	CSA	2.5	2.5	1	01-Dec 2022 to 29-March 2023
-82	CSA	3	3	1	01-Dec 2022 to 29-March 2023

WORK PROGRAMME 2023-2024 – DESTINATION 5

“Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data”

Will be implemented through:

A. Calls from HaDEA

- Call HORIZON-CL4-202**3**-SPACE-01: will open on 22 Dec 2022, with deadline 28 March 2023
- Call HORIZON-CL4-202**4**-SPACE-01: will open on 21 Nov 2023, with deadline 20 Feb 2024

B. Calls from EUSPA

- Call HORIZON-EUSPA-202**3**-SPACE: will open in Oct 2023, with deadline in Feb 2024

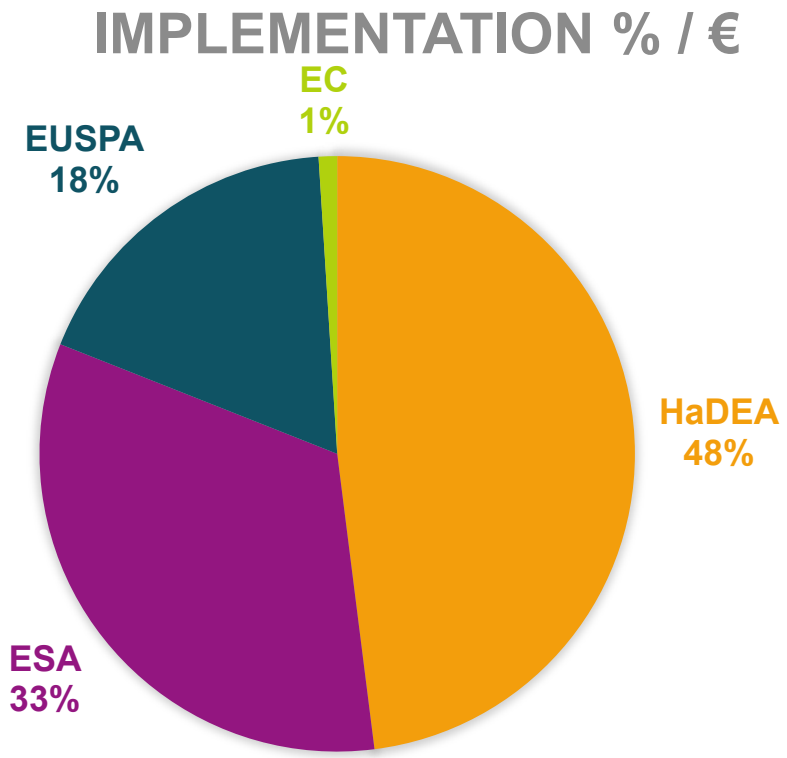
C. Tenders, calls and procurements from ESA

D. Tenders from the European Commission

European Commission

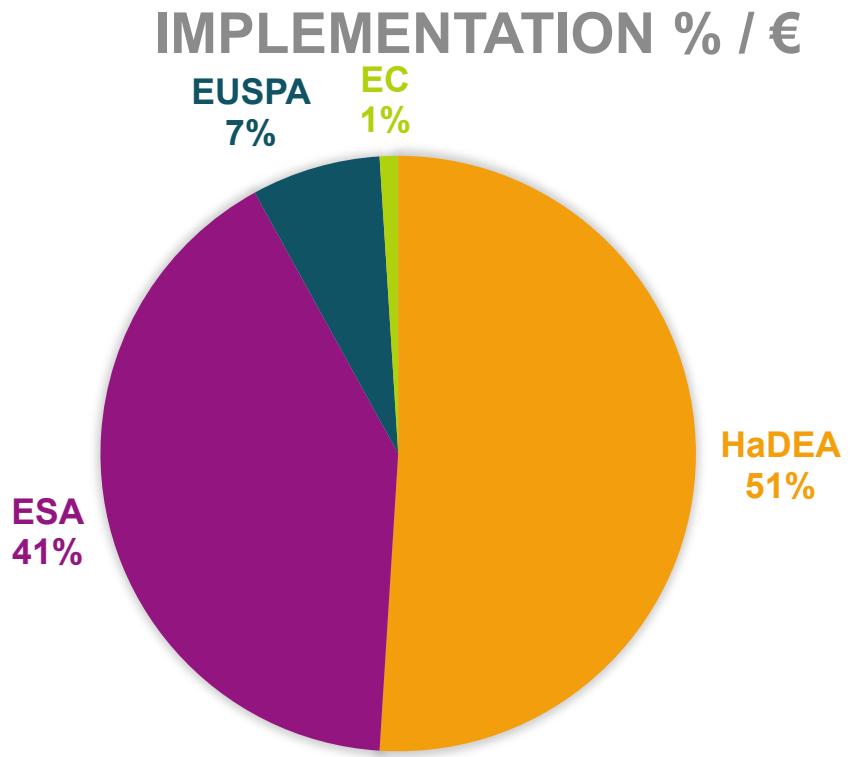
2023: €290 million → 11 areas → 29 topics

1.	Competitiveness	€28 million
2.	Access to Space	€53 million
3.	Evolution of EGNSS	€50 million
4.	GOVSATCOM/Secure Connectivity	€38 million
5.	Copernicus Services	€19 million
6.	EGNSS & Copernicus applications + PRS uses + GOVSATCOM uses	€47 million
7.	Quantum	€8 million
8.	Space Entrepreneurship	€1 million
9.	IOD/IOV	€15.1 million
10.	Technological non-dependence	€20 million
11.	Space Science	€10,7 million



2024: €200 million → 9 areas → 16 topics

3. Evolution of EGNSS	€46 million
4. GOVSATCOM/Secure Connectivity	€20,6 million
5. Copernicus Services	€10 million
7. Quantum	€14 million
8. Space Entrepreneurship	€13 million
9. IOD/IOV	€13 million
10. Technological non-dependence	€20 million
12. Space Surveillance and Tracking (SST)	€56.5 million
13. Space WEather (SWE) & Near-Earth Objects (NEO)	€5.7 million



A. Implemented by HADEA

European Commission

1- Competitiveness

Foster competitiveness of space systems

- HORIZON-CL4-2023-SPACE-01-11: End-to-end Earth observation systems and associated services
- HORIZON-CL4-2023-SPACE-01-12: Future Space Ecosystem and Enabling Technologies
- HORIZON-CL4-2023-SPACE-01-13: Future Space Ecosystem: Management and Coordination Activity

2 – Access to Space

Reinforce EU capacity to access to space

- HORIZON-CL4-2023-SPACE-01-21: Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground system tests
- HORIZON-CL4-2023-SPACE-01-22: New space transportation solutions and services
- HORIZON-CL4-2023-SPACE-01-23: Modern, flexible and efficient European test, production and launch facilities

3 – Quantum

Innovative space capabilities: Quantum

- HORIZON-CL4-2023-SPACE-01-62: Quantum Communication Technologies for space systems
- HORIZON-CL4-2023-SPACE-01-63: Quantum Space Gravimetry Phase-A Study
- HORIZON-CL4-2024-SPACE-01-64: Quantum Space Gravimetry Phase-B study & Technology Maturation

4 – Copernicus Services

Evolution of services: Copernicus

- HORIZON-CL4-2023-SPACE-01-31: Copernicus for Atmosphere and Climate Change, including CO2
- HORIZON-CL4-2023-SPACE-01-32: Copernicus for Emergency Management
- HORIZON-CL4-2023-SPACE-01-33: Copernicus in-situ component
- HORIZON-CL4-2023-SPACE-01-34: Copernicus for Marine Environment Monitoring
- HORIZON-CL4-2024-SPACE-01-35: Copernicus for Land and Water
- HORIZON-CL4-2024-SPACE-01-36: Copernicus for Security

5 – Space science & technological non-dependence

Targeted and strategic actions supporting the EU space sector

- HORIZON-CL4-2023-SPACE-01-71: Scientific exploitation of space data
- HORIZON-CL4-2023-SPACE-01-72: Space technologies for European non-dependence and competitiveness
- HORIZON-CL4-2024-SPACE-01-72: Space technologies for European non-dependence and competitiveness

6 – Space Surveillance and Tracking (SST) (Identified beneficiary = EUSST)

Contribution to ensuring full and optimal capacity of the EUSST Partnership.

- HORIZON-CL4-2024-SSA-SST-MS - New & improved EUSST Missions and Services
- HORIZON-CL4-2024-SSA-SST-AE - SST & STM system architecture and evolutions
- HORIZON-CL4-2024-SSA-SST-SB - Space-based SST (mission, system and sensors network)
- HORIZON-CL4-2024-SSA-SST-SP - SST Sensors and Processing
- HORIZON-CL4-2024-SSA-SST-SD - SST Networking, Security & Data sharing

B. Implemented by EUSPA

European Commission

7 – Applications for Galileo, EGNOS and Copernicus, including Galileo PRS & GOVSATCOM

- HORIZON-EUSPA-2023-SPACE-01-41: EGNSS - Transition towards a green, smart and more secure post-pandemic society
- HORIZON-EUSPA-2023-SPACE-01-42: EGNSS - Closing the gaps in mature, regulated and long lead markets
- HORIZON-EUSPA-2023-SPACE-01-43: Copernicus-based applications for businesses and policy-making
- HORIZON-EUSPA-2023-SPACE-01-46: Designing space-based downstream application with international partners
- HORIZON-EUSPA-2023-SPACE-01-61: EU GOVSATCOM for a safer and more secure EU
- HORIZON-EUSPA-2023-SPACE-01-45: Joint test activities for Galileo PRS services
- HORIZON-EUSPA-2023-SPACE-01-44: The Galileo PRS Service for governmental-authorised use cases

8 – Cassini

- Support to New Space - CASSINI Business Accelerator
- Support to New Space - CASSINI Hackathons & Mentoring
- Support to New Space - CASSINI myEUspace

C. Implemented by ESA (mostly)

European Commission

9 – Space Weather & NEO

- Space Weather: development of certain technology elements for promising precursor services
- Near Earth Objects: precursor services/ European hot-redundant Minor Planet Centre backup” and “Increase networking of national assets.

10 – EGNSS Upstream

- Other Actions: Mission and Services (COM Public procurement)
- Other Actions: Technology and Infrastructure
- Other Actions: Operations and service provision (Delegated to EUSPA)

11 – GOVSATCOM / Secure Connectivity (IRIS^2)

- Other Actions: GOVSATCOM/Secure Connectivity infrastructure
- Other Actions: GOVSATCOM/Secure Connectivity upstream R&D

12 – IOD/IOV

- The IOD/IOV activities intend to provide a regular and cost-effective service and solution for common flight ticket actions (management, spacecraft design including reuse of existing solutions, assembly, integration and tests, launch and operations) based on EU solutions both for the spacecraft (i.e. platform, experiments aggregation, operations in orbit including preparation and associated Ground Segment) and for the launch services.

Thank you for your attention!

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HorizonEU

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