#HorizonEU

European Commission

**THE EU
RESEARCH & INNOVATION
PROGRAMME**

2021 – 2027

Horizon Europe Cluster 4 - Digital, Industry and Space

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Overview 'Digital'

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Research and
Innovation

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)

The 2030 Digital Compass

Skills

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

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

Public Services

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

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

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✓ **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

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Cluster 4 – Strategic Priorities
From EU priorities to Work Programme Destinations

Cluster 4 directly supports the following three Key Strategic Orientations outlined in the Strategic Plan 2021-2024 (ec_rtd_horizon-europe-strategic-plan-2021-24.pdf (europa.eu))

- 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)

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Cluster 4 'Digital, Industry and Space' Destinations in Work Programme 2023-24

Key Strategic Orientation	Destination
Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy	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	A digitised, resource efficient, and resilient industry **RESILIENCE**
	World-leading data and computing technologies **DATA**
	Digital and emerging technologies for competitiveness and fit for the green deal **DIGITAL-EMERGING**
	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	A human-centred and ethical development of digital and industrial technologies **HUMAN**

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Indicative Budget of Cluster 4

2021-27 budget of 15.348 bn€ (including NGEU)

For the WP 2023-2024, the **programmable budget is ~2.7 bn€**, distributed *approximately* as:

DESTINATION	BUDGET 2023-2024
Destination 'Climate neutral, circular and digitised production'	634.3 M€
Destination 'Increased autonomy in key strategic value chains for resilient industry'	559.2 M€
Destination 'World leading data and computing technologies'	161.0 M€
Destination 'Digital and emerging technologies for competitiveness and fit for the green deal'	461.5 M€
Destination 'Open Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data' (incl. Other Actions)	183.8 M€
Destination 'A Human-centred and ethical development of digital and industrial technologies'	317.5 M€
Other Actions	369.5 M€

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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€)

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Climate neutral, circular, and digitised production 2023-2024

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

World leading Data and Computing Technologies 2023-2024

SECTIONS	NUMBER OF TOPICS	ESTIMATED BUDGET (EUR 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 budget WP 2023-2024	7	161

EuroHPC JU: 254 MEUR

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

SECTIONS	NUMBER OF TOPICS	ESTIMATED BUDGET (EUR 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 in OA)	97
Open Source for Cloud/Edge and Software Engineering Fundamentals to support Digital Autonomy	3 (incl. 1 CSA)	35,5
TOTAL estimated budget WP 2023-2024	25	486,5

KDT JU: 590 MEUR, SNS JU: 265 MEUR

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Article 22(5) – Application in 2023 topics

High TRL Quantum Technologies

Participation is limited to legal entities established in <u>Member States, Iceland and Norway and the following additional associated country: Israel</u>

- **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 <u>Member States, associated countries, OECD and Mercosur countries</u>

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

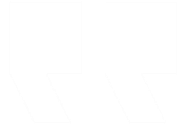# A human-centred and ethical development and industrial technologies
2023-2024

SECTIONS	NUMBER OF TOPICS	ESTIMATED BUDGET (EUR M)
Research and Innovation for Industry 5.0	4 (incl. 1 CSA)	26,5
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 and Space)	4 (all CSAs)	14
TOTAL estimated budget WP 2023-2024	33	317.5

Register to the upcoming Horizon Europe CL4 Info Days on WP23-24:

Events | The research and innovation community platform (europa.eu)

Thank you!

HorizonEU

http://ec.europa.eu/horizon-europe

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

HORIZON-CL4-2023-TWIN-TRANSITION-01   81 MEur

HORIZON-CL4-2023-TWIN-TRANSITION-01

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

Call - WORLD LEADING DATA AND COMPUTING TECHNOLOGIES 2023

HORIZON-CL4-2023-DATA-01

76 MEur

HORIZON-CL4-2023-DATA-01

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

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

HORIZON-CL4-2023-DIGITAL-EMERGING-01

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

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)

(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	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

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

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

HORIZON-CL4-2023-HUMAN-01   *9 MEur*

HORIZON-CL4-2023-HUMAN-01

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*

HORIZON-CL4-2023-HUMAN-01-CNECT

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