



HORIZON EUROPE



THE EU RESEARCH & INNOVATION PROGRAMME

2021 – 2027

Horizon Europe
Information Days –
Cluster 4

12 October 2023

Destination 3 Data,
Destination 4 Digital
Emerging and Destination
6 Human



WELCOME SESSION

12 October 2023

9.30–9.40



Thibaut Kleiner

Director for Policy,
Strategy and Outreach,
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European Commission



EU strategic priorities and 2024 CL4 digital topics

Destination 3 Data

EU Strategy and policy files	Strategic Priorities	Expected Impacts	Topics' Headings
<p>A European strategy for data</p> <p>Europe's Digital Decade Policy Programme 2030</p> <p>EU Green Deal</p>	<ul style="list-style-type: none"> - A single European data space based on European rules and values. - Trustworthy digital environment for empowered citizens - Strengthening Europe's capabilities and infrastructures for hosting, processing and using data - Target of 10.000 climate-neutral edge nodes - No net emissions of greenhouse gases by 2050 - Climate-neutral, highly energy efficient and sustainable data centres 	<ul style="list-style-type: none"> - Contribute to open, trusted and federated Common European data spaces. - Define, quantify and measure bias in data sets - Shorten the time-to-market and reduce development costs of compliant data solutions - Paving the way to strategic industrial cooperation in data processing - Quantify and reduce the environmental footprint of data operations 	<p>Data sharing and analytics capacity</p> <p>From Cloud to Edge to IoT for European Data</p>

EU strategic priorities and 2024 CL4 digital topics

Destination 4 Digital Emerging

EU Strategy and policy files	Strategic Priorities	Expected Impacts	Topics' Headings
<p>A European strategy for data</p> <p>Digital Decade Policy Programme 2030</p> <p>EU Green Deal</p>	<ul style="list-style-type: none"> - A strong and competitive EU economy that shapes technology in a way that respects European values. - A single European data space based on European rules and values. - Digital Target of 10.000 climate-neutral edge nodes - Digital Pillar 'Secure and performant sustainable digital infrastructures' - No net emissions of greenhouse gases by 2050 - Climate-neutral, highly energy efficient and sustainable data centres 	<ul style="list-style-type: none"> - Responsible software engineering methods, tools, and best practices - Prototypes of cloud and edge servers demonstrated in centralised and distributed environments - Improved penetration of core photonics technologies into multiple domains and industry sectors - Mature quantum sensing technologies and devices in different application sectors - Combined robotics-data-AI solutions and AI-Data solutions to address large scale environmental challenges 	<p>AI, Data and Robotics)</p> <p>Open Source for Cloud/Edge and Software Engineering Fundamentals to support Digital Autonomy</p> <p>European Innovation Leadership in Photonics</p> <p>Graphene and 2D materials: Europe in the lead</p> <p>Flagship on Quantum Technologies: a Paradigm Shift</p>

EU strategic priorities and 2024 CL4 digital topics

Destination 6 Human

EU Strategy and policy files	Strategic Priorities	Topics Expected Impacts	Topics' Headings
<p>White Paper on Artificial Intelligence</p> <p>Digital Decade Policy Programme 2030</p> <p>EU Standardization Strategy</p> <p>European Digital Rights and Principles</p>	<ul style="list-style-type: none"> - European way to digital transformation (democratic values, fundamental rights, and contributing to a climate-neutral economy) - A strong and competitive EU economy that shapes technology in a way that respects European values - Information provision on the use of high-risk AI systems - European leadership in global standards - European Digital Rights and Principles: Putting people at the centre of the digital transformation 	<ul style="list-style-type: none"> - Trustworthy AI - Increased influence of Europe into ICT standardisation - Develop sectorial ICT standardisation in support of EU policies - Strengthening EU's approach to a human-centred digital transformation - Measuring the implementation of the Digital Rights and Principles 	<p>Leadership in AI based on trust</p> <p>European standards for industrial competitiveness</p> <p>Digital Humanism and human compatible technologies</p>



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THE EU RESEARCH AND INNOVATION PROGRAMME (2021-27)

Destination 3 - Objective "Data sharing and analytics capacity"



Call – WORLD LEADING DATA AND COMPUTING TECHNOLOGIES

Data sharing and analytics capacity

- HORIZON-CL4-2024-DATA-01-01: AI-driven data operations and compliance technologies (AI, data and robotics partnership) (IA)

From Cloud to Edge to IoT for European Data

- HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)
- HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the 'Cloud-Edge-IoT' Solutions (Horizontal Activities - CSA)

HORIZON-CL4-2024-DATA-01-01 AI-driven data operations and compliance technologies (AI, data and robotics partnership)

EU contribution per project (indicative): EUR 8-10 million

Indicative budget of the call: EUR 38 million

Type of Action: Innovation Actions (IA)

Funding rate: (up to): 60% (100% for non-profit entities) of eligible costs

TRL: Achieve TRL 6-7 by the end of the project

Eligibility conditions: The general conditions are described in General Annex B.

If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).

Legal entities established in China are not eligible to participate in Innovation Actions in any capacity.

HORIZON-CL4-2024-DATA-01-01 AI-driven data operations and compliance technologies (AI, data and robotics partnership)

Expected impact (in the Destination 3 introduction):

Proposals for topics under this Destination should set out a credible pathway to contributing to world-leading data and computing technologies, and more specifically to one or several of the following impacts:

- Improved European leadership in the global data economy
- Maximised social and economic benefits from the wider and more effective use of data
- Reinforced Europe's ability to manage urgent societal challenges (e.g. data for crisis management, digital for clean)

HORIZON-CL4-2024-DATA-01-01 AI-driven data operations and compliance technologies (AI, data and robotics partnership)

Expected Outcomes:

- To enable companies and public sector to easily **comply with existing and emerging regulation** (e.g. GDPR, Data Governance Act, Data Act, Artificial Intelligence Act) and **create value on data assets** that they possess or that they acquire from the market, and to allow citizens to feel more confident that data-driven systems treat them in a **fair, unbiased and compliant** way and respect their privacy/anonymity and other rights, and keep track of the use of personal data in a world where “everything” moves online.
- **Define, quantify and measure bias** in data sets (especially those used for AI development).
- Shorten the time-to-market and reduce development costs of compliant data solutions
- Contribute to open, trusted and federated **Common European data spaces**.
- **Quantify and reduce the environmental footprint** of data operations which will contribute to the Green Deal target “no net emissions of greenhouse gases by 2050”

HORIZON-CL4-2024-DATA-01-01 AI-driven data operations and compliance technologies (AI, data and robotics partnership)

Scope (1):

- Developing, piloting and integrating systems, compliance tools and data economy enablers that **process the increasing data volumes more efficiently, distil more useful knowledge from data**, and contribute to the measurement, labelling, certification and reduction of the **environmental footprint** of massive data operations (e.g. by minimizing data transfers/traffic, improving energy reuse and/or reducing energy consumption of AI training/machine learning, privacy preservation and other processes).
- Apply/support/cater for **design principles and architectures that are inherently compliant**, addressing the relevant cybersecurity issues. Compliance should be understood in the broad sense, involving **legal, ethical and environmental compliance**.
- Practical, affordable and automated **compliance tools** (e.g. privacy preservation, smart contracting, consent management, bias detection, quality measurement, tracking of uses of data etc.)

HORIZON-CL4-2024-DATA-01-01 AI-driven data operations and compliance technologies (AI, data and robotics partnership)

Scope (2):

- Provide **Common European data spaces** and **AI data provision** with reliable mechanisms to **monitor, control and track/record transactions on data, to ensure compliance.**
- Employ appropriate **technologies and methods**, such as federated and distributed AI/analytics and associate them with trustworthy AI techniques; protect privacy and confidentiality of AI training data and reduce energy footprint.
- Address **interoperability for data sharing**, where relevant, focusing on open, standardised, and trusted concepts
- The **competencies** represented in the consortium should cover all the relevant aspects (technical, legal, commercial, societal, ethical) appropriately.

HORIZON-CL4-2024-DATA-01-01 AI-driven data operations and compliance technologies (AI, data and robotics partnership)

Required collaborations/links:

Build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms.

In particular, proposed actions should build on the results of:

- Horizon 2020 data platform projects (topic **ICT-13-2018-2019**)
- HORIZON-CL4-2021-DATA-01-01 projects (compliance, privacy, green data operations)
- HORIZON-CL4-2023-HUMAN-01-01 projects (data for trustworthy AI)

The proposed actions should create links and seek synergies, where appropriate, with:

- Common European Data Spaces (Digital Europe)
- European Digital Innovation Hubs (Digital Europe).

Useful links

- https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-7-digital-industry-and-space_horizon-2023-2024_en.pdf
- <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-data-01-01>
- <https://digital-strategy.ec.europa.eu/en/policies/eu-data-projects>

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THE EU RESEARCH AND INNOVATION PROGRAMME (2021-27)

Destination 3 - Objective "From Cloud to Edge to IoT for European Data"



Call – WORL LEADING DATA AND COMPUTING TECHNOLOGIES

Data sharing and analytics capacity

- HORIZON-CL4-2024-DATA-01-01: AI-driven data operations and compliance technologies (AI, data and robotics partnership) (IA)

From Cloud to Edge to IoT for European Data

- HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)
- HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the ‘Cloud-Edge-IoT’ Solutions (Horizontal Activities - CSA)

Horizon Europe Work Programmes 2021/22, 2023/24

Innovative technologies for the next generation Cloud-Edge-IoT continuum

2020 –

Software technologies

IoT Research
IoT and Digitising Industry Pilots

Cloud Computing

2021/22

Open Source for Cloud based services

Environments & tools for Decentralised Intelligence at edge
Future European Platforms for the Edge: Meta OS

Cognitive Cloud Framework: AI-enabled Computing Continuum

2023/24

Open Source for Cloud/ edge Digital Autonomy:

Piloting emerging Smart IoT Platforms and decentralised intelligence (IA)

Cognitive Computing Continuum: Intelligence & automation for more efficient data processing:

2025 –

...

Funding > 250 Mill € WP2021-24

HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

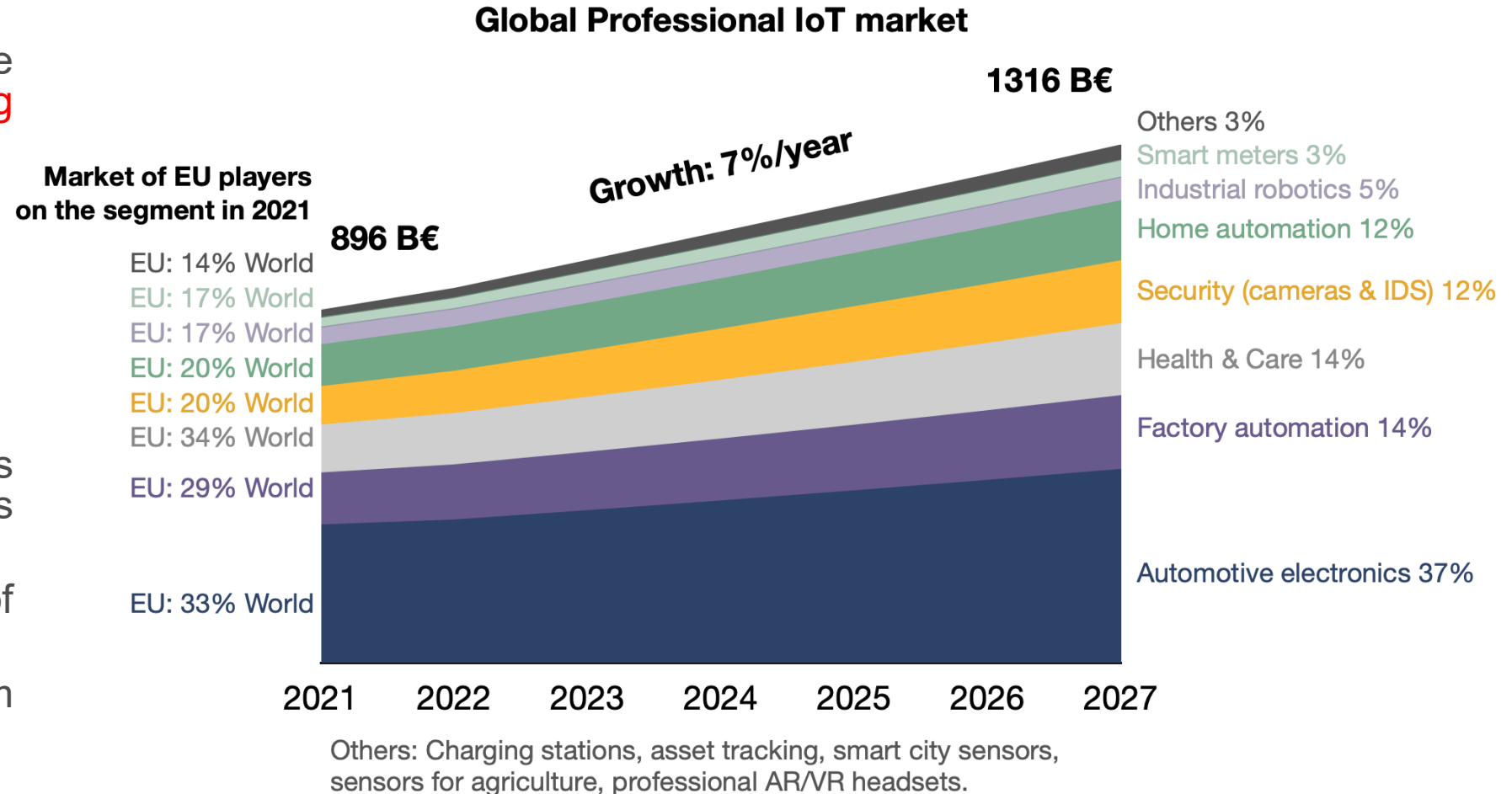
Growth in Industrial Edge-IoT Markets

In 2021, the EU players are well positioned in the **leading professional IoT segments**:

- Automotive electronics
- Factory Automation
- Energy
- Health & Care

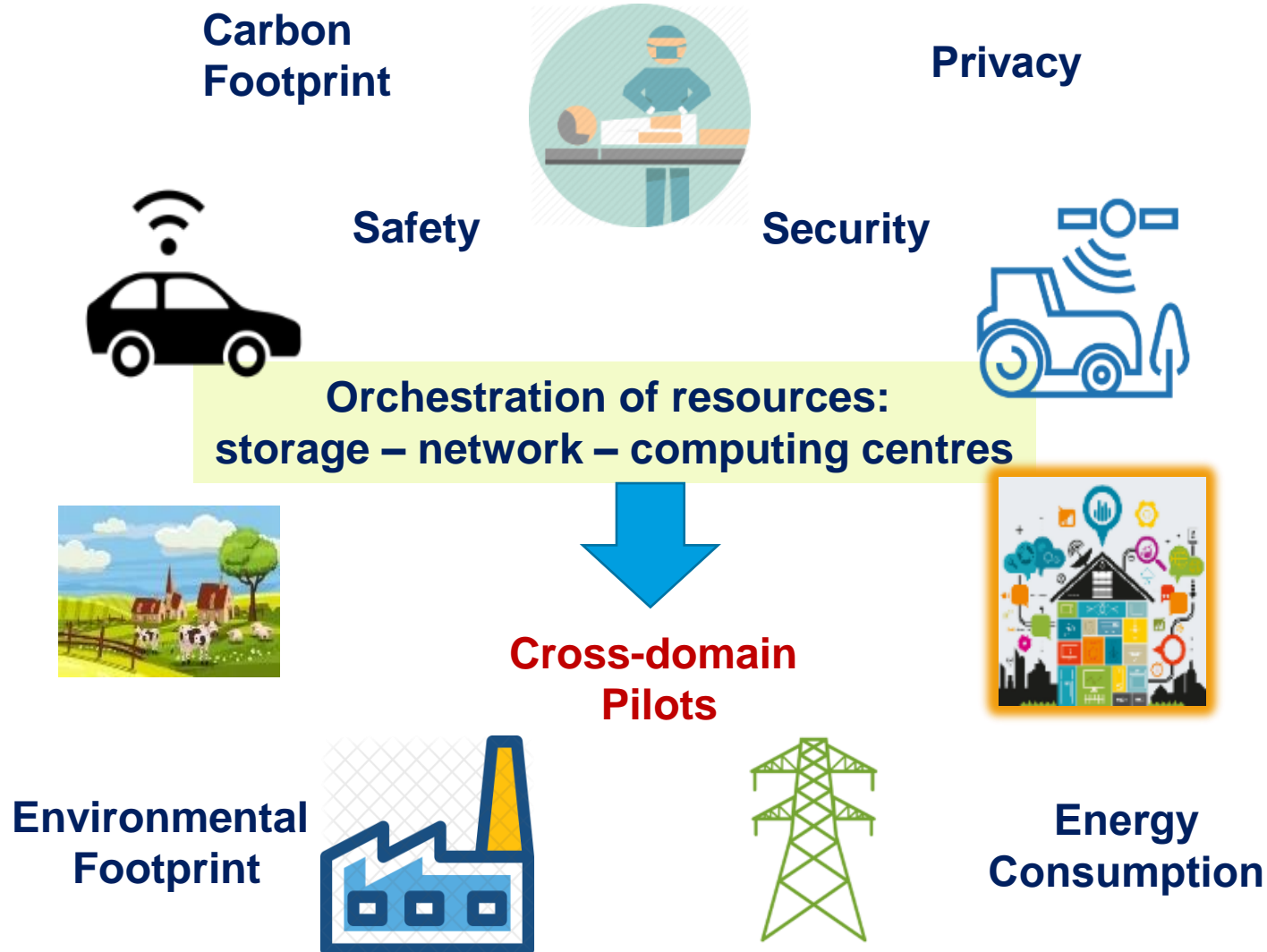
EU ecosystems face numerous challenges that hamper its global competitive position:

- Reversing the trend of outsourcing to Asia
- Competition from Hyperscalers



HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

Industrial IoT Use cases underpinning the trend towards the edge



Strategy:
A Platform Approach to share hardware and foster an Open Ecosystem

Pilots for the Edge

- **Challenges of System Integration**
- Embedded Systems & Control
- Internet of Things – Connected Objects
- Cloud – Digital Twins - Orchestration
- **A Platform Economy @theEdge**
 - **taking a system-level approach**
 - * from hardware of smart devices
 - * to operating systems at device and at system level,
 - * to middleware and to application software
 - *Functions/Apps over the Air up-dates*
 - *Avoid Vendor Lock-in - Open, vibrant ecosystem*



HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

Expected outcomes:

- ❖ Implementations of edge paradigms in real environments leading to matured and customised IoT + next generation edge computing technologies for adoption in key applications and sectors.
- ❖ Strategic industrial cooperation in data processing
→ by building open platforms, agreement on common architectures and standards.
- ❖ Open platforms underpinning an emerging open edge ecosystem including midcaps, SMEs and start-ups that foster edge solutions.
- ❖ Demonstrating cross-domain standardization and up-scaling of edge infrastructure solutions
- ❖ *Sectors strategic for European competitiveness: industrial automation, renewable energy, electro-mobility, and farming).*
- ❖ Financial Support to Third Parties: for max. 20% of funding // max amount 200k €; to increase the innovation capacity of industry, in particular SMEs, through take-up and validation of emerging edge platform interfaces, in particular to foster edge solutions, which represent a modular functional spectrum of executable apps and services.

EU contribution per project: **20 - 25 million EUR**

Indicative budget of the call: **45 million EUR**

Type of Action: **Innovation Action**

TRL: **Activities to start at TRL 3-4 and to achieve TRL 6-7 by the end of the project**

HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

Scope:

- **up-take and up-scaling of emerging EU-driven smart industrial internet of things and edge computing systems to perform under real life conditions.**
 - mature particular technologies like meta-operating systems for the IoT and the Edge, cognitive cloud technologies and tools for decentralized intelligence and swarm computing.
- **systems to become open platforms underpinning an emerging open edge ecosystem including midcaps, SMEs and start-ups that foster edge solutions,**
 - taking a system-level approach.
 - orchestrating multi-tiered data processing with control and automation on the edge, minimizing energy footprint, stimulating multi-sided marketplaces, and fostering open standards for virtualization, interoperability and secure and trusted data sharing.
- **adoption across key applications and sectors:**
 - pilots should validate cross-domain interfaces and common standards and foster cross-sector industrial agreements on architectures, design tools and governance.

HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

Scope: Checklist for Multidisciplinary / horizontal Activities

- **address cross-sector platforms in more than one application domain, which are strategic for European competitiveness**
such as renewable energy, buildings and electro-mobility, farming and/or industrial automation, including strategic aspects such as condition-monitoring/predictive maintenance and logistics, or other relevant application domains computing.
- **Proposal to include a business case and exploitation strategy.**
- **Standardisation:** Research should cover interoperability for data sharing @theEdge // build on existing standards or contribute to standardisation
- **Collaboration in a wider context:**
 - Pilot projects will contribute to the coherence/cluster work that will be implemented by the CSA called under WP2024-DATA-01-05.
 - collaboration with existing projects and synergies with other relevant European, national or regional initiatives, funding programmes and platforms such as KDT JU, GAIA-X, et al

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HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the 'Cloud-Edge-IoT' Solutions (Horizontal Activities - CSA)

Expected outcomes:

- coordinating the proposal portfolio resulting from *HORIZON-CL4-2024-DATA-01-03*, and ensure consistent exploitation of the outcomes.;
- Outcomes expected to accelerate the uptake in most important sectors for Europe's economy, and competitiveness
- Underpinning an emerging open edge ecosystem including midcaps, SMEs and start-ups, critical to establishing a mature European supply chain.
- Regaining European competitiveness in internet infrastructures through **effective partnership models and the provisioning of open solutions**
- → *analysis of cross cutting aspects like open standards, open-source frameworks, data compliance, security as well as synergies across sectors.*
→ *Alignment with national or regional initiatives to create an expanding innovation eco-system, anchored in local contexts across Europe*

EU contribution per project: 2 million EUR

Indicative budget of the call: ~ 2 million EUR

Type of Action: Coordination and Support Action

HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the 'Cloud-Edge-IoT' Solutions (Horizontal Activities - CSA)

New IoT Paradigms and their Impact of EU Markets

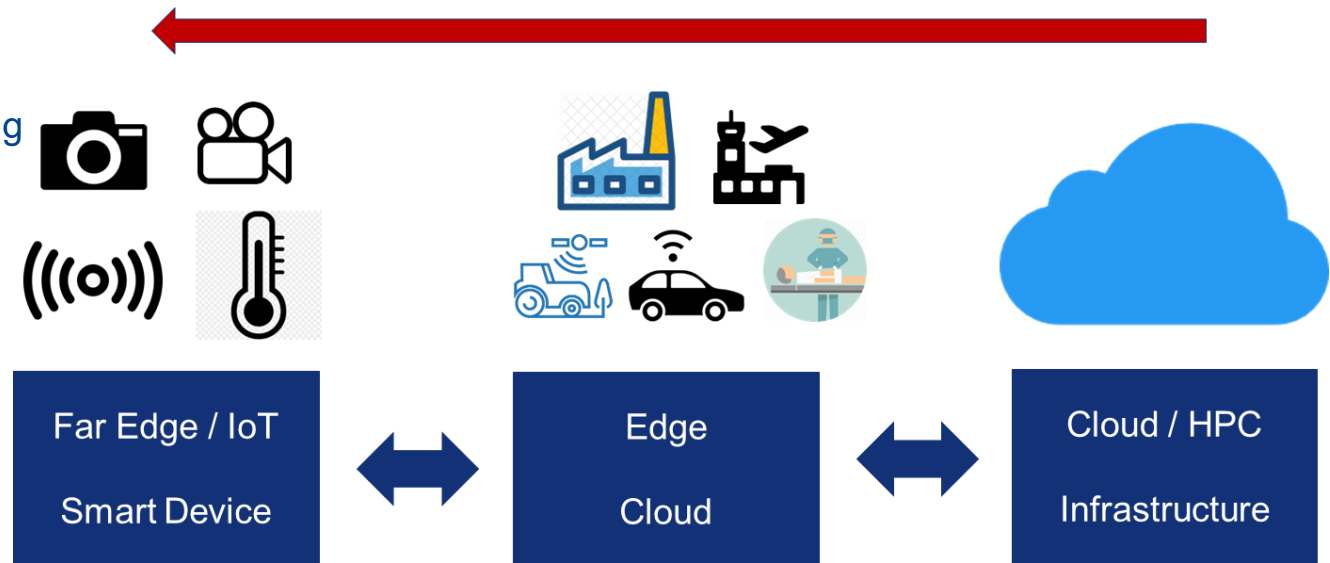
- **Trends like edge technologies and decentralised Intelligence** will reshape the industrial landscape,

- spurring innovation towards the edges of the IoT network (edge clouds and edge computing)
- trend scouting, portfolio analysis, analysis of emerging business cases
- accelerate the pick-up of novel advanced edge technology in most important sectors for Europe's economy, and competitiveness

- **An open framework for a vibrant Edge-IoT ecosystem** is key for up-scaling and to leverage economies of scale

- analysis of cross cutting aspects like open standards, open-source frameworks, data
- compliance, security as well as synergies across sectors.
- Promotion of Open Calls via FSTP
- Underpinning an emerging open edge ecosystem including midcaps, SMEs and start-ups,

Trend/Paradigm Shift: from Cloud to Edge
Bringing compute resources closer to the data

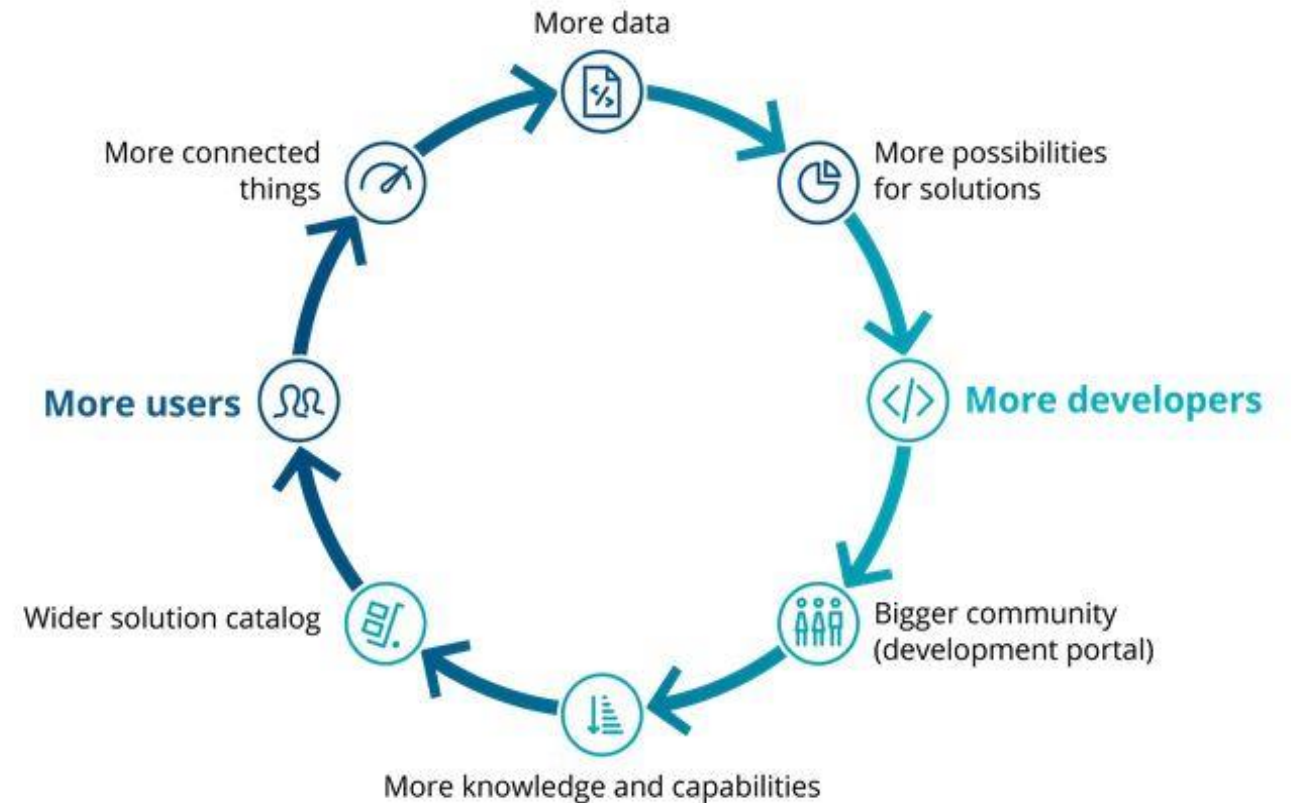


Federating far edge resources ad hoc (e.g. via 5G) to provide edge-cloud resources close to the edge

HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the 'Cloud-Edge-IoT' Solutions (Horizontal Activities - CSA)

A framework to spur a vibrant IoT ecosystem

- Manage Complexity through *an open platform approach*
- *The value of an IoT Platform corresponds to the size of its ecosystem* behind the platform
- *Edge platforms* lead to new opportunities for *network orchestration and computing*
- Require **consensus on interoperability and standards** as well as ecosystem building in and across verticals



Source: Deloitte analysis.

Deloitte Insights | deloitte.com/insights

HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the 'Cloud-Edge-IoT' Solutions (Horizontal Activities - CSA)

Support of programme implementation, focus on horizontal activities across projects and topics in the area of Cloud-Edge-IoT,

→ especially foster consensus on interoperability and standards as well as ecosystem building in and across verticals, an environmental and green impact.

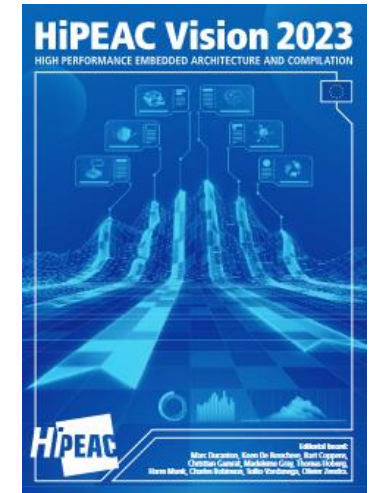
- Among which are key activities:

- a forum to link to relevant European and national initiatives and partnerships like KDT JU, especially links to INSIDE and EPOSS.
- A fertile communication strategy for broader stakeholder engagement
- trend scouting, portfolio analysis, workshops, analysis of emerging business cases, accelerator of technology up-take and **promotion of open calls**, especially for SMEs and midcaps
- Better international collaboration of European cloud/edge and software industry with trusted partner regions
- Proposals should involve appropriate expertise in Social Sciences and Humanities

HORIZON-CL4-2024-DATA-01-05: Platform Building, standardisation and Up-scaling of the 'Cloud-Edge-IoT' Solutions (Horizontal Activities - CSA)

Related Background

- **Horizon Europe:**
→ [Calls, topics, deadlines WP2023-24](#)
- **Position Papers and Event Reports**
→ Alliance AIOTI Strategic Foresight : [IoT and Edge Computing Convergence](#)
- **Cloud-Edge-IoT Portal** – see www.EUCloudEdgeIoT.eu
- HIPEAC Vision <https://www.hipeac.net/vision/#/latest/>
- [Edge-IoT Policy](#) on Europa
- **Brokerage Event Meeting 04 December 2023** .. [→ Registration](#)



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