HORIZON-CL4-Destination 3:
Piloting emerging Smart IoT Platforms and decentralized intelligence

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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

Coud 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

Funding > 250 Mill € WP2021-24

2023/24

Open Source for Cloud/ edge Digital Autonomy

Software Engineering Fundamentals to support Digital Autonomy

Piloting emerging Smart IoT Platforms and decentraised intelligence (IA)

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

2025 –

. . .

HE CL4 - Dest. 3, Section:
From Cloud to Edge to IoT for European Data

Pilot Actions - IA: -- 45 Mill €

- **Piloting emerging Smart IoT Platforms and decentralized intelligence**

RIA 2023 – 28 Mill €:

- **Cognitive Computing Continuum: Intelligence and automation for more efficient data processing**

-

CSA (2 Mill €):

- **Horizontal Activities – 2 Mill €**
  of the 'the 'Cloud-Edge-IoT' platform building
  → standards, governance, security, SME/start-ups

- Coordination and Support
  of **Cognitive Computing Continuum research and policy – 2 Mill €**

- **Collaboration with NSF – 1 Mill €**
  on fundamental research on new concepts for distributed computing and swarm intelligence
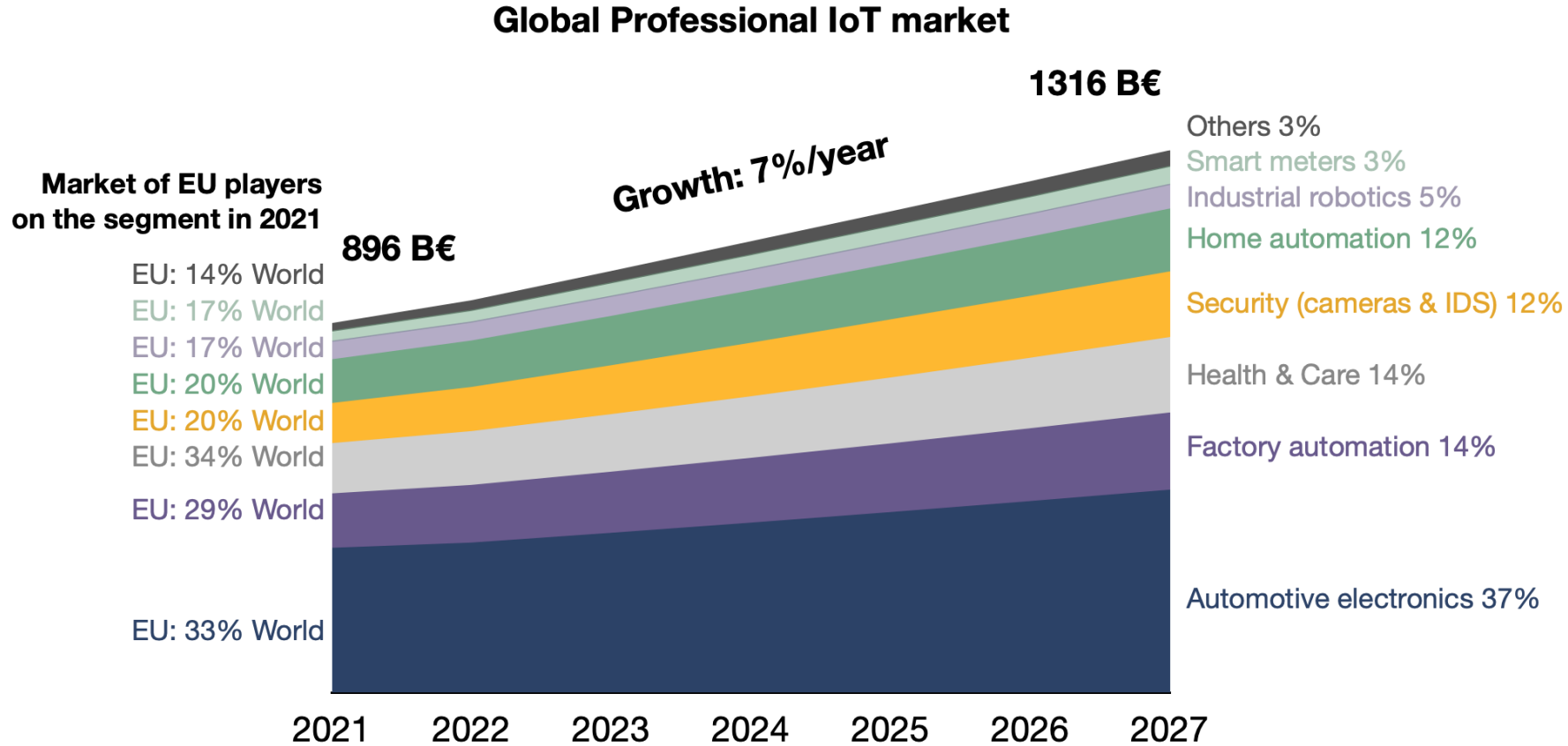
2024 Calls Open

European Commission

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 should hampers its global competitive position:

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

Global Professional IoT market

1316 B€

Growth: 7%/year

896 B€

Others 3%
Smart meters 3%
Industrial robotics 5%
Home automation 12%
Security (cameras & IDS) 12%
Health & Care 14%
Factory automation 14%
Automotive electronics 37%

Market of EU players on the segment in 2021

EU: 14% World
EU: 17% World
EU: 17% World
EU: 20% World
EU: 20% World
EU: 34% World
EU: 29% World
EU: 33% World

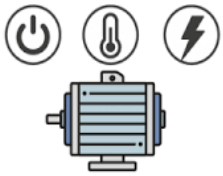2021 2022 2023 2024 2025 2026 2027

Others: Charging stations, asset tracking, smart city sensors, sensors for agriculture, professional AR/VR headsets.
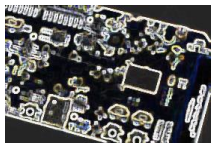
Source: DECISION Etudes & Conseil

European Commission

Edge Value Chains

IoT ecosystem: From Smart devices to Cloud

Smart devices

IoT modules

- Hardware
- Software
- IA/ML

Network

- LP WAN
- WiFi
- LTE-M
- 5G
- Bluetooth
- MQTT

Near Edge Cloud

Network / joint server

Actility

kerlink
communication is everything

Security / IAM

THALES

nexus
INGROUPE

Application

Bosch IoT
Insights

legrand

SIEMENS

Far Edge Cloud

Hyperscalers
Big Data Cloud

aws

Microsoft
Azure

Applications

| Mobility | Manufacturing & Logistics |
| Energy | Smart City |
| Smart Building | Agriculture |

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European Commission
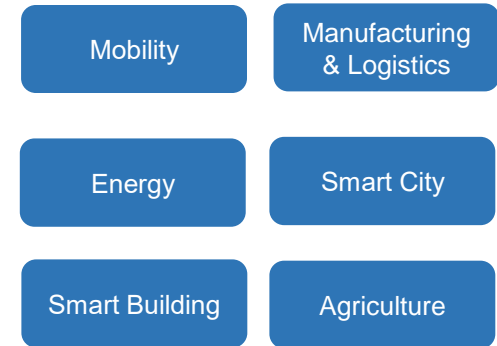
Pilots for the Edge

- **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*

European Commission

Decentralised Intelligence at the Edge
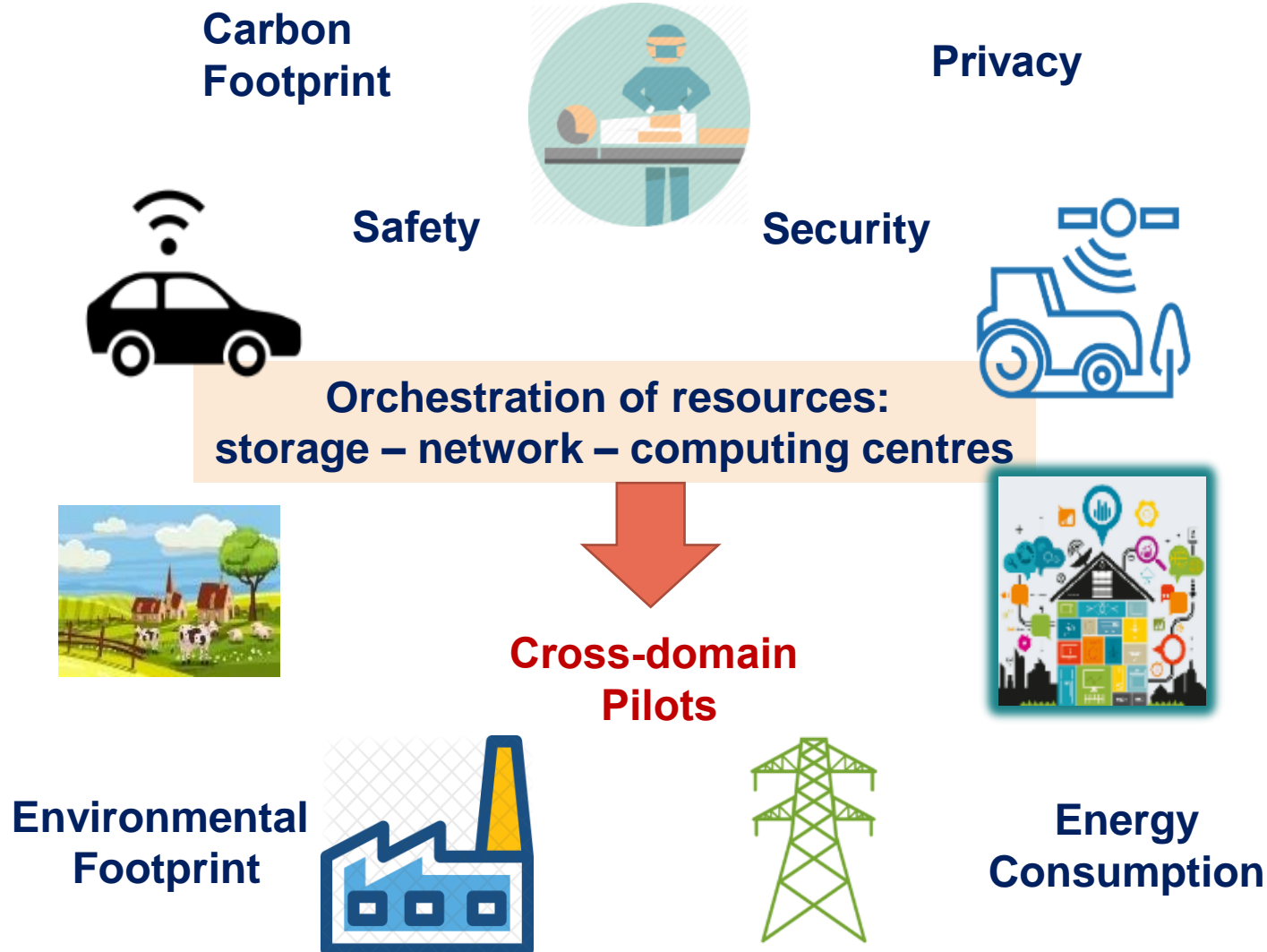→ *dynamic up-dates of services + functions*

- Mix between cloud – edge operations
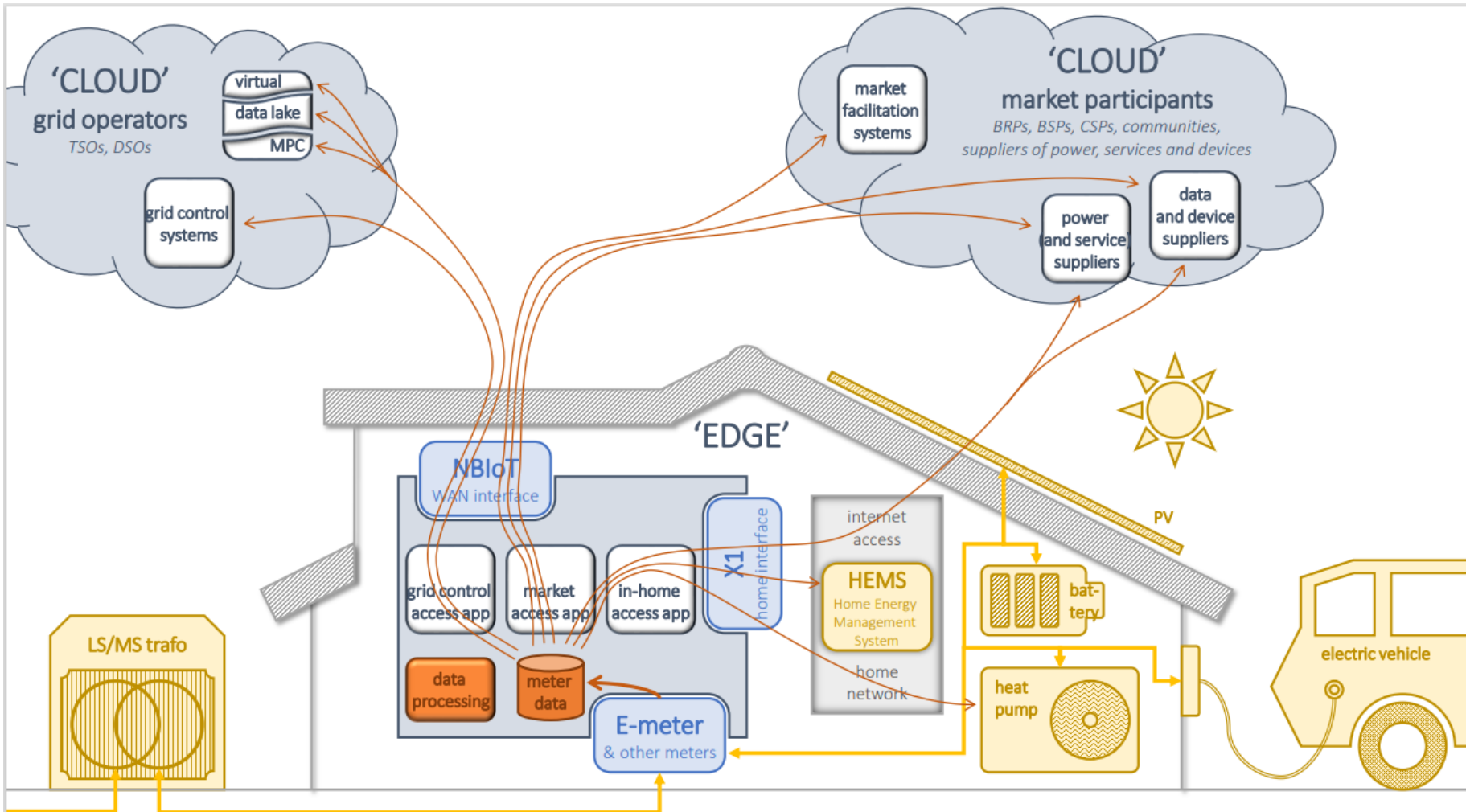
- **Possible Market actors**
  - OEMs of EVs + EV CPOs
  - Energy communities
  - virtual power plants / home batteries
  - EV fleet management

Courtesy: TECHNOLUTION

European Commission

Industrial IoT Use cases underpinning the trend towards the edge

Carbon Footprint

Privacy

Safety

Security

Cross-sector Approach

Orchestration of resources: **storage – network – computing centres**

Cross-domain Pilots

Environmental Footprint

Energy Consumption

Strategy:

A Platform Approach to share hardware and foster an Open Ecosystem

➤ *in areas such as renewable energy, buildings and electro-mobility, farming and/or industrial automation (incl. condition-monitoring/predictive maintenance and logistics)*

European Commission

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

➢ **Type of Action:** Innovation Actions (IA)

Opening: 15 November 2023	Deadline: 19 March 2024
Budget: EUR 45 million	**EU contribution per project**: EUR 20 – 25 million

➢ **Technology Readiness:** Level Activities are expected to start at TRL 3-4 and achieve TRL 6-7 by the end of the project
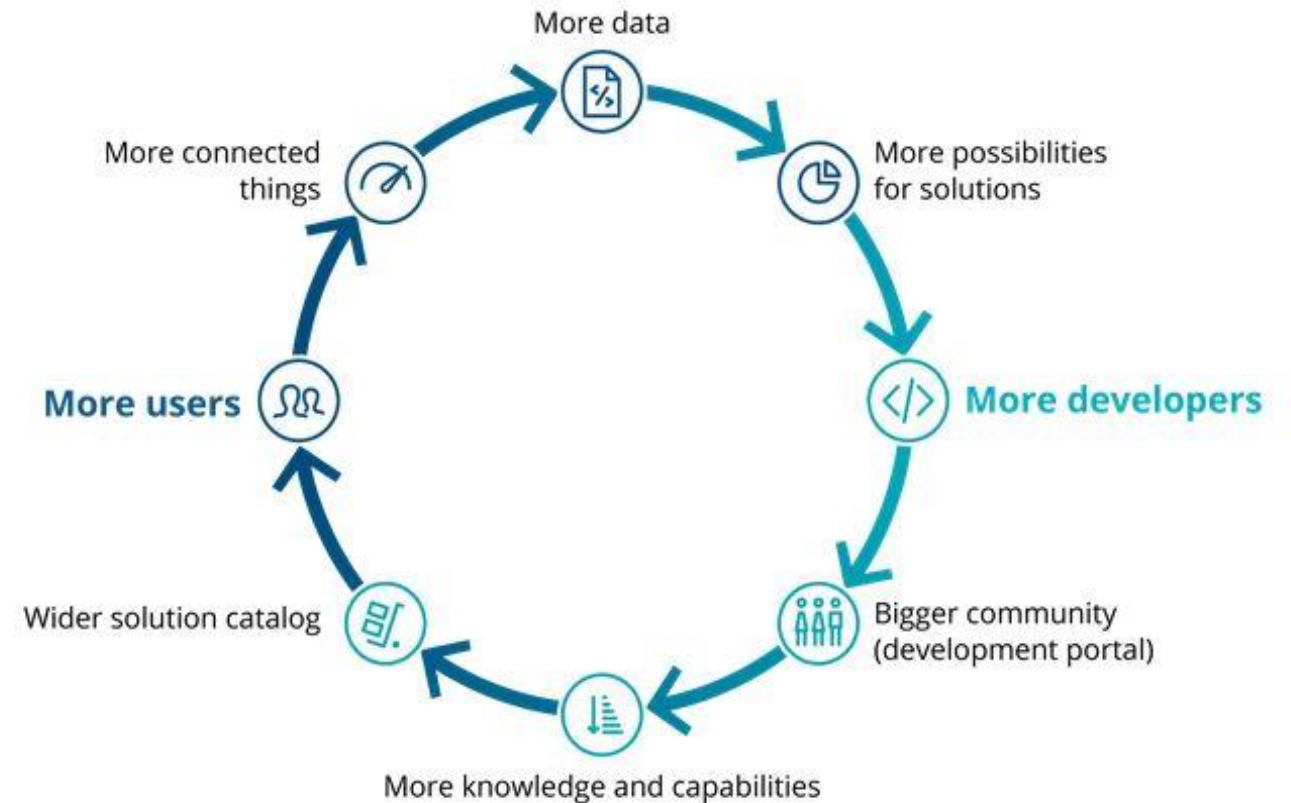
FSTP: Financial Support to Third Parties: for max. 20% of funding // max amount 200k €

→ **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.

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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

More data

More possibilities for solutions

More developers

Bigger community (development portal)

More knowledge and capabilities

Wider solution catalog

More users

More connected things

Source: Deloitte analysis.

Deloitte Insights | deloitte.com/insights

A reference architecture – Open Source
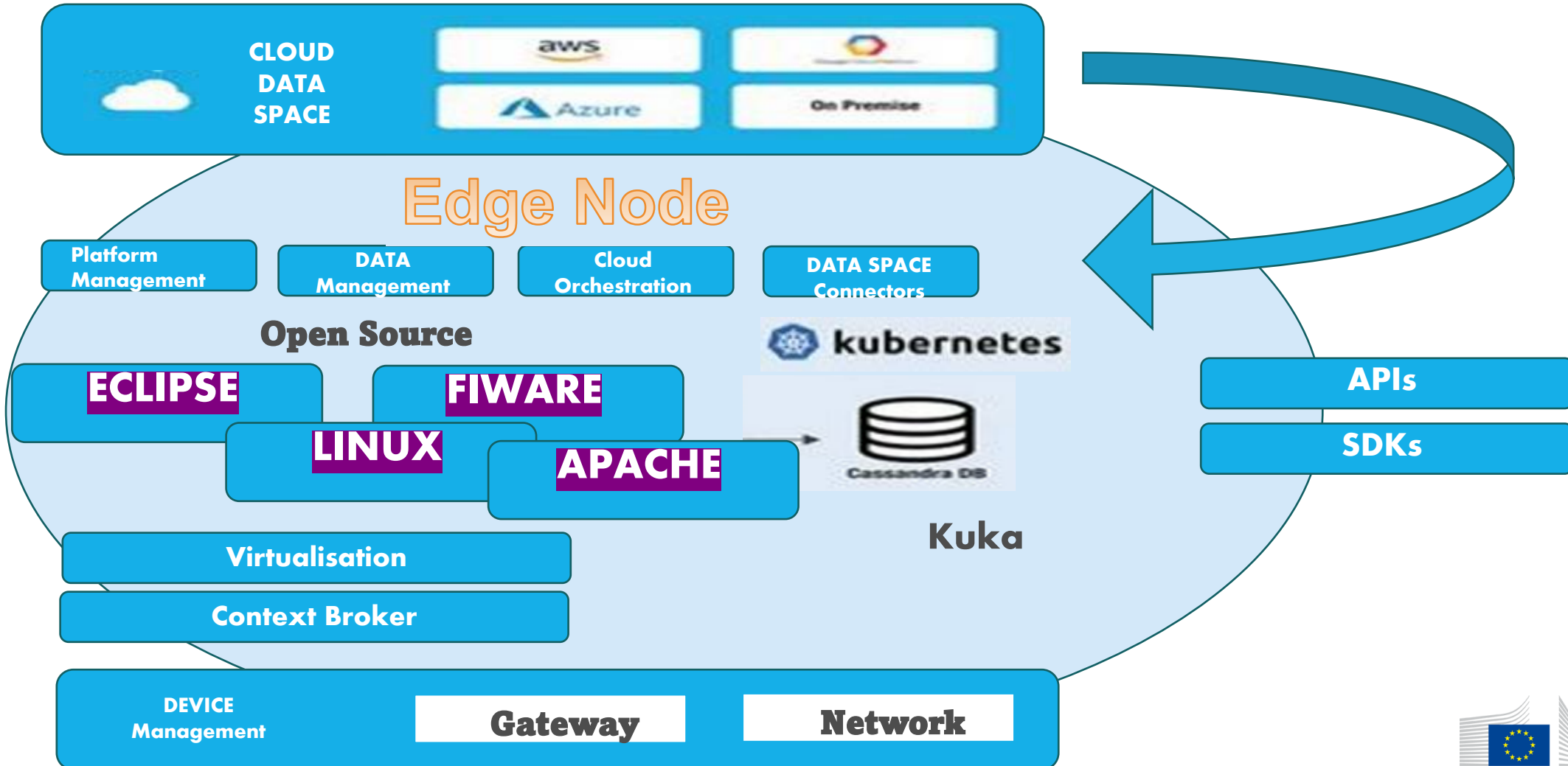
HORIZON-CL4-2024-DATA-01-03: Piloting emerging Smart IoT Platforms and decentralized intelligence (IA)

Scope: Checklist for Multidisciplinary / horizontal Activities

➢ **address cross-sector platforms in more than one application domain, which are strategic for European competitiveness** .

➢ Address cross-cutting aspects like open standards, open-source frameworks, data compliance, security as well as synergies across sectors.

➢ **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

Piloting Smart IoT Platforms + decentralised Intelligence

➢ **More Computing Capacity at the Edge**

- Leverage next generation of **chip supply in Europe**

➢ **Platform Economy at the Edge**

- Open APIs .. Towards an **App Store at the Edge**

- Up to 20% for Open **Call for Edge applications**

➢ **Fostering the Green and Digital Transition**

- **Edge services spanning across different key domains**

- **Common architectures and open standards**

- **HE WP2024 call for Innovation Actions with 45 Mill €**

19 March 2024

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

- Europe's Potential in Edge Computing – Market Study