IoT and EDGE Computing

"Delivering innovation through standards"

Rolf Riemenschneider
DG CONNECT/E4
Internet of Things
European Commission

Industrial Internet of Things: the strategic picture for Europe

Next-generation IoT

Power to the edge, where the data is

Seamless connectivity

Next-generation operating systems

Decentralised/swarm intelligence

Cognitive computing continuum

Next-generation chips powering intelligence at the edge

Chips Act

Low energy semiconductor chips - made in Europe

Standardisation, interoperability

Vertical, horizontal, x-sector integration

Common Open Digital Platforms & Ecosystem

Competition law, geopolitics

Strategic autonomy

Investment in Data Spaces

EU 5G & cloud-edge infrastructure/services

Data Strategy

Data legislation:

- Data Act: access & fairness on data market
- Data Governance Act: foster trust in data sharing & intermediarires

Transition pathways towards resilient, innovative, sustainable & digital ecosystems

Open, dynamic ecosystems for EU tech businesses

New Industrial Strategy

The EU Policy Context:

- ❑ NextGenerationEU
- ❑ REPowerEU
- ❑ Twin Transition:
  - Digital Compass
  - Green: Fit for 55

European Commission

Dr. Max Lemke, CNECT E4

Paradigm Shift: Cloud – Edge - IoT

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

Far Edge / IoT
Smart Device

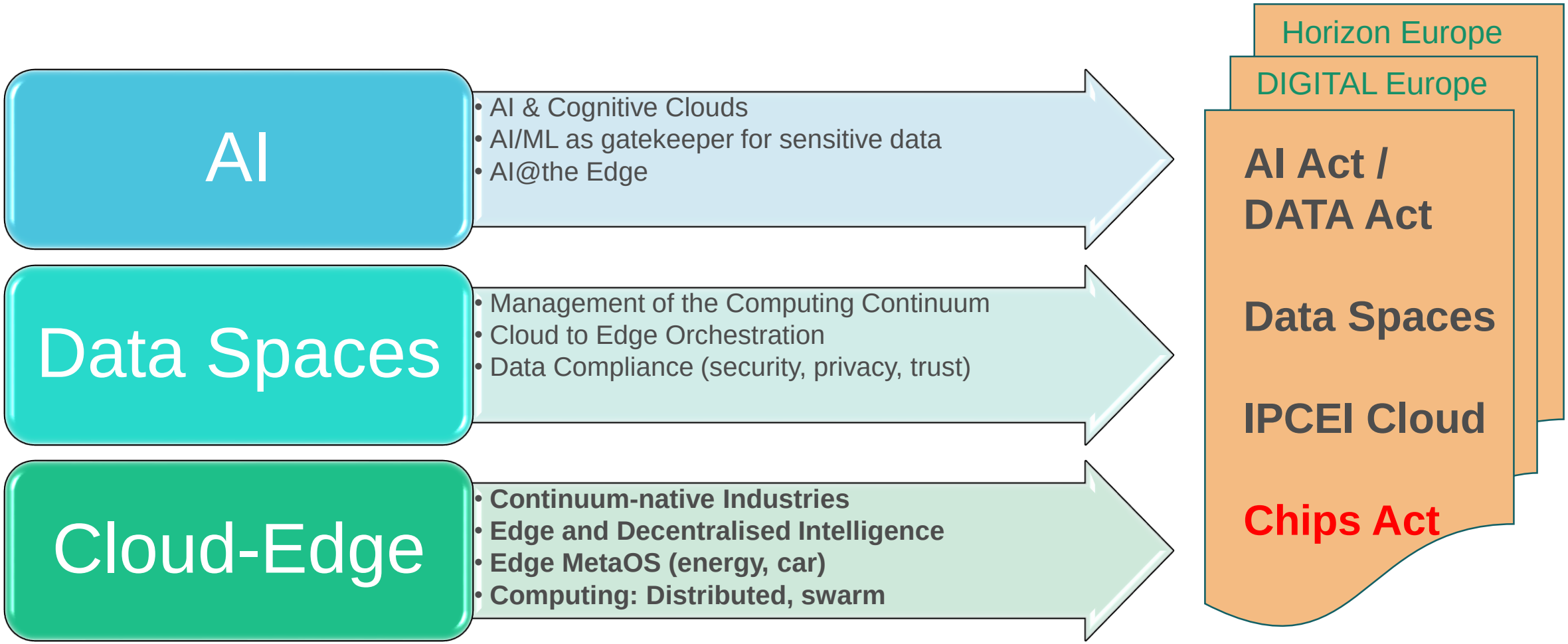
Edge
Cloud

Cloud / HPC
Infrastructure

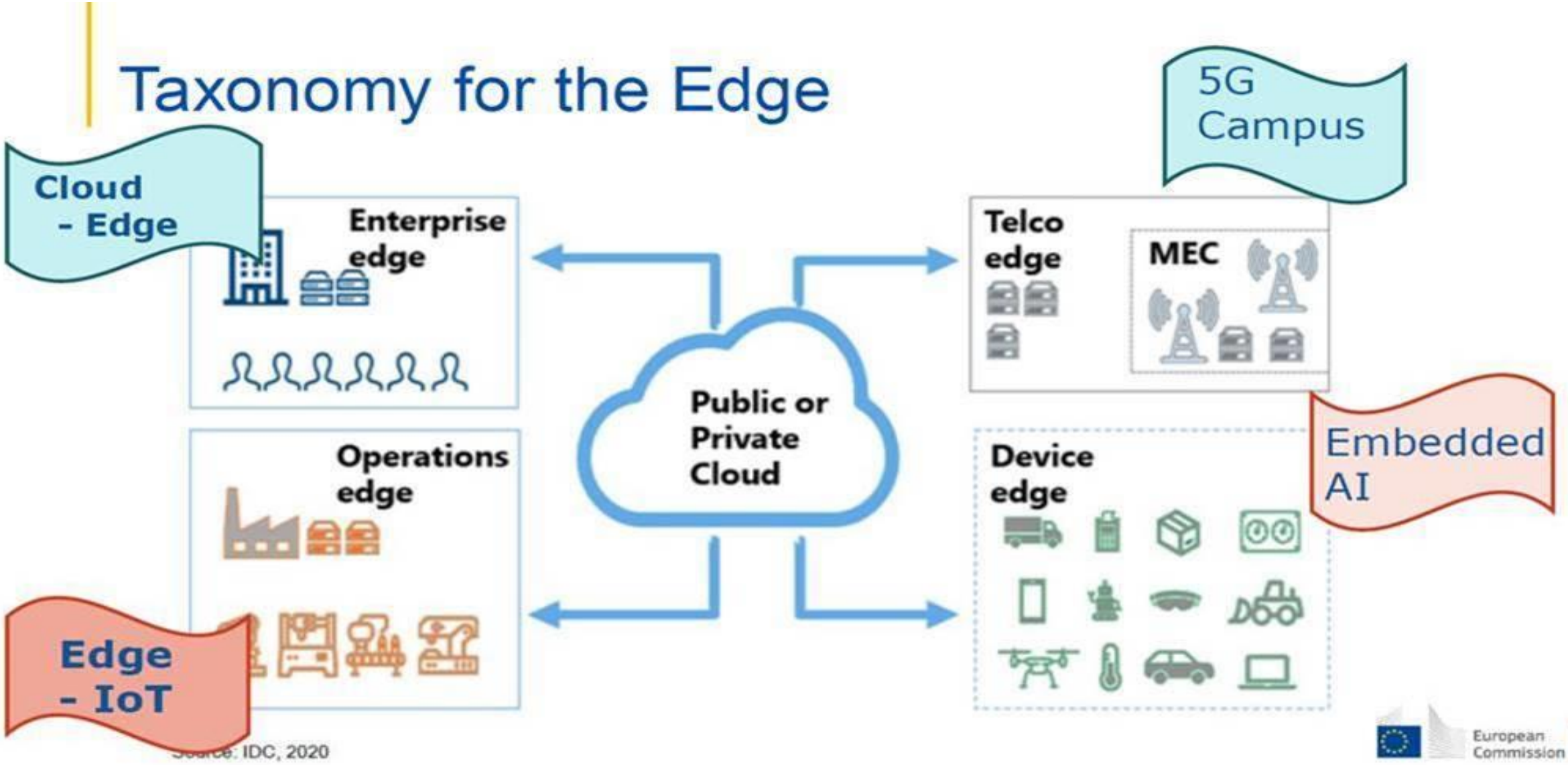
Federating far edge resources ad hoc via 5G
to provide edge-cloud resources close to the edge

European Commission

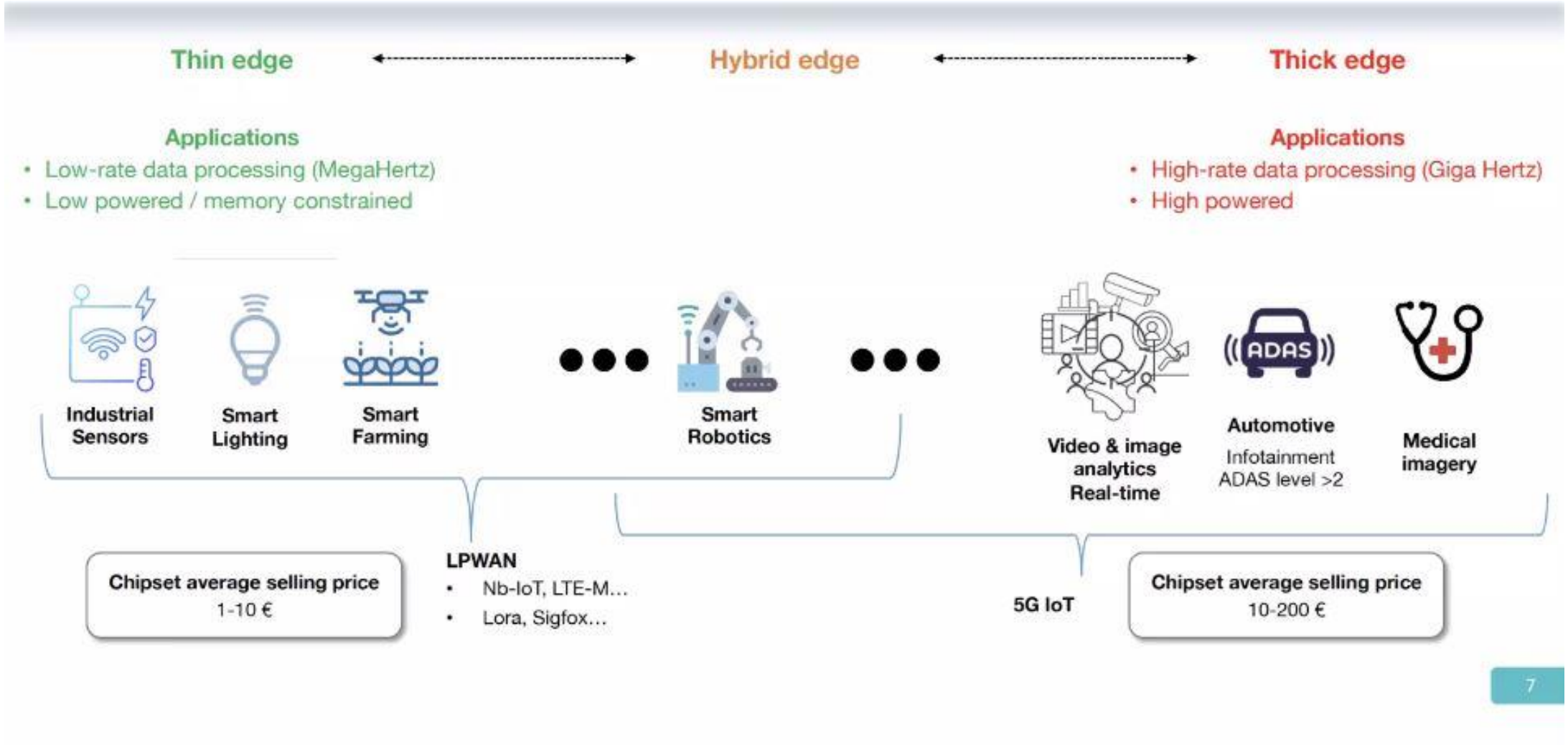
Cloud-Edge-IoT Policies & Standards



Need of Reference Architecture Models



Leverage emerging computing paradigms



→ *From embedded computing towards distributed computing, Swarm intelligence, AI@the edge ..*

Use cases

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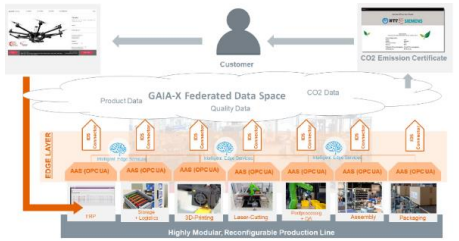
EUROPEAN IOT-EDGE-CLOUD

Manufacturing:

Data-Driven Cognitive Production Lines (Manufacturing Autonomy Level 4 – MAL4)



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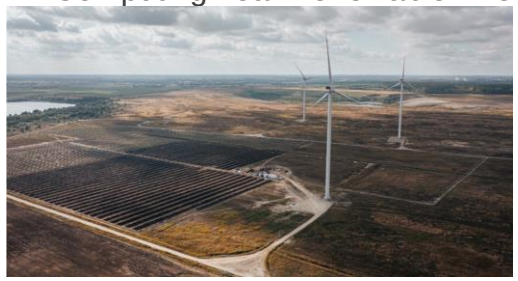
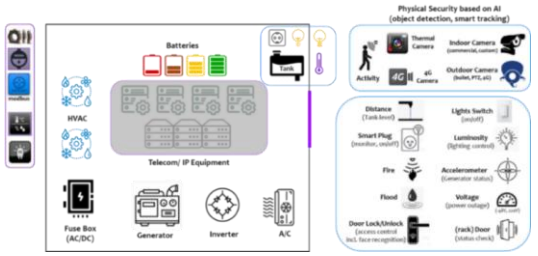
Renewable energy:

Containerised Edge Computing near Renewable Energy



Smart Buildings:

Energy Efficient, Health Safe & Sustainable Smart Buildings



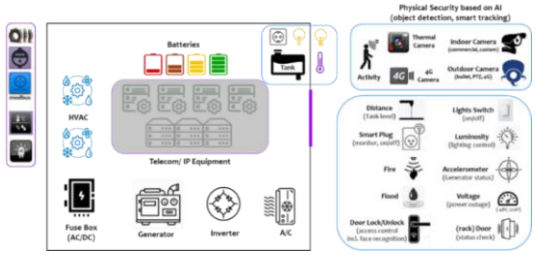
Renewable energy:

Cloud/Edge for secure and sustainable solutions
Flexiblity adapted to consumer needs

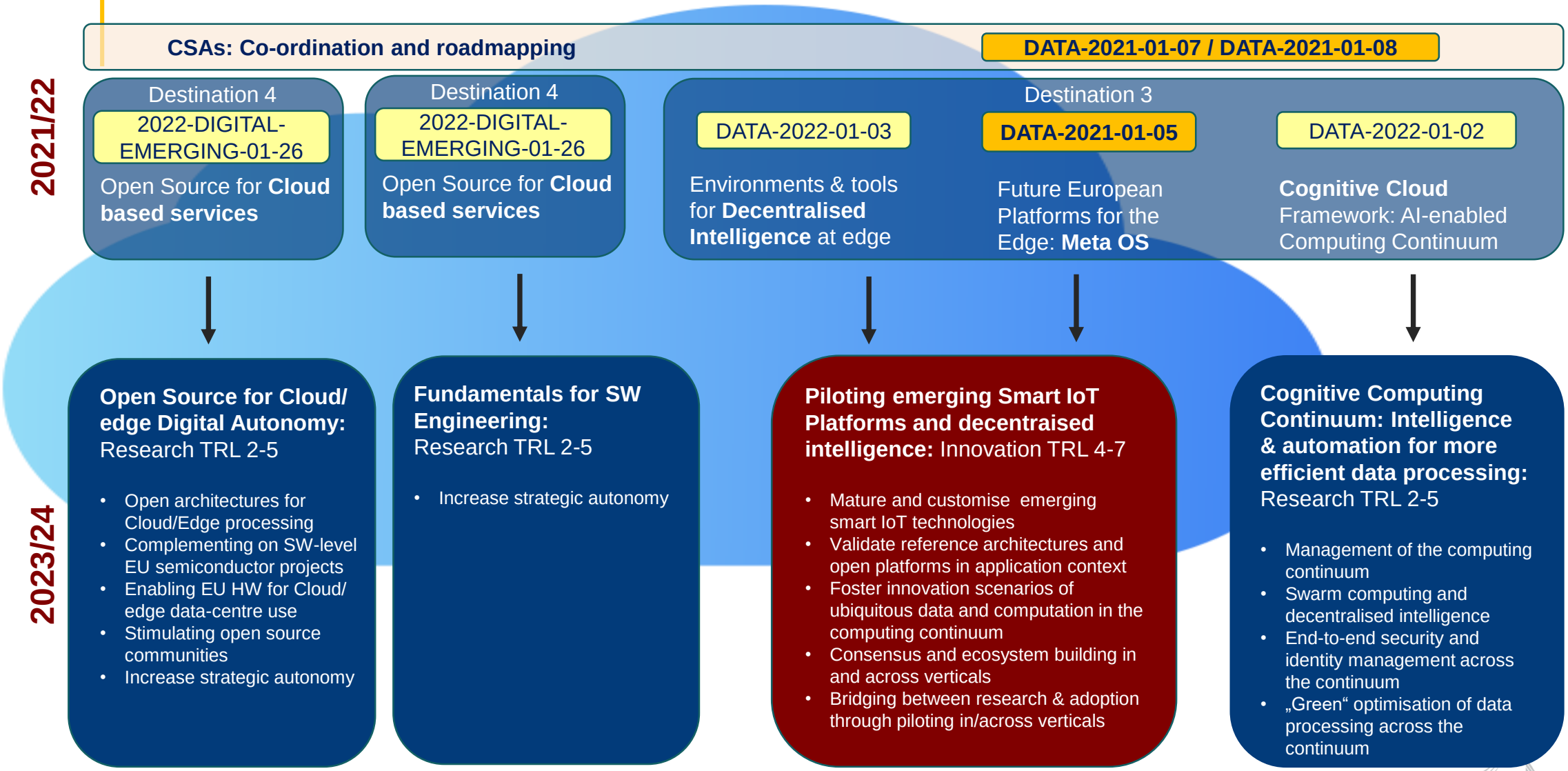
NEBULOUS

Farming:

Hyper-distributed Apps across logistics, agriculture, energy



Cloud - Edge – IoT: Horizon Europe Work Programme 2023/24



Key Input: Industrial Cloud / Edge Technology Roadmap

Key Input: Cloud-Edge-IoT Strategy Forum

Key Input: Industrial Cloud / Edge Technology Roadmap

European Commission

Conclusions

- ***Open platforms*** are important for spurring innovation across our economies
- Platforms are crucial for mastering complexity & focusing on strengths and roles
- *European industry* must become **drivers of the Edge platforms** of tomorrow

- **Key elements of open platforms for the Edge**
  - A common definition of edge topology
  - Key use cases for Edge Computing
  - Open APIs and standardisation as an element for edge platforms
  - Use of open source

THANK YOU

Useful links:

- **HIPEAC Vision on Continuum of Computing**:
  https://www.hipeac.net

- **Project, Open calls, Events the European Cloud Edge IoT Continuum**
  → https://www.eucloudedgeiot.eu/

PORTAL

- **GAIA-X Initiative**:
  https://www.data-infrastructure.eu/GAIAX/ :

GAIA-X

- The Alliance AIOTI: **IoT + Edge Computing Convergence**
  https://aioti.eu/news/

AIOTI