BCO Network

BCO Network WEBseries: European IoT Strategy

11 March 2025

Speakers:
Stefan Bogensberger, DG CNECT
Doris Marquardt, DG CNECT
Rolf Riemenschneider, DG CNECT

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European Digital Connectivity Awards 2025

The Application Form and the guide for applicants are available here

Deadline to apply: 2 June, 2025

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Feedback needed

BCO – SF Survey – **Deadline: as soon as possible**

5GSC Survey – for national BCOs only – **Deadline: as soon as possible**

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Save the date

Hosted by: HAKOM CROATIAN REGULATORY AUTHORITY FOR NETWORK INDUSTRIES

2025 BCO Network

Physical Event

Zagreb, Croatia

11-12 June 2025

National and University Library in Zagreb

Address: Hrvatske bratske zajednice 4, Street

Entrance: East entrance, “CROATRIUM”

To register, please send your contact details to: sofia.profico@broadbandeurope.eu

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Save the date

2025 BCO Network **Annual Conference**

Brussels

Monday, 06 October 2025

Madou Plaza Tower
Address: Chaussee de Louvain 1, 1210, Brussels

To register, please send your contact details to: sofia.profico@broadbandeurope.eu

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Europe‘s Internet of Things Policy

Doris Marquardt, Rolf Riemenschneider, Stefan Bogensberger
European Commission, DG CNECT Unit E4 – Internet of Things

BCO Network | 11 March 2025

European Commission

Today‘s Agenda

Internet of Things (IoT)

Agriculture

Digitalisation of the European Agricultural Sector

EU IoT Strategy

3C networks, Cloud-Edge-IoT pilots and selected verticals

Digitalisation of the European Agricultural Sector

11 March 2025
BCO Network Webinar

Dr. Doris MARQUARDT,
European Commission, DG CNECT, Unit E4

The Vision

Research

Innovation

Deployment

“Draghi Report”

The future of European competitiveness
A competitiveness strategy for Europe

- Proposes to foster the **competitiveness** of **industry**
- Calls for dedicating attention to the development of **start-ups and SMEs**
- Emphasizes the relevance to **share data across sectors to boost innovation**.

The sector and the value chain in figures

Share in employment

4.5% (2020)[1]

Decrease from 10.2% in 1995 to 4.5% in 2020; huge differences between MS

Share of EU GDP

1.3% (2023)[2]

Big Four": FR, DE, IT, ES;

(Mobility 7%, Energy 6%)

Trade balance

€229 B EUR (2022)[3]

In 2022, the EU exported €229.1 billion in agricultural products and imported €195.6 billion

(Automotive: Exports to third countries: €158 billion in 2022. Imports: € 62 billion)

Food trade surplus

€70.1 B EUR (2023)[3]

Exports €228.6 billion, imports €158.6 billion, total surplus of €70.1 billion (2023); with an increasing trade balance

Share of Agriculture in total trade

8.1% (2023)[4]

Agricultural Machinery

7000 Manufacturers[5]

Annual turnover of €40 billion.
Global Exports 2021: €7.4 billion. DE: €1.3 billion; China: €0.9 billion; US €0.81 billion; followed by IT and FR

US productivity advantage

3.5x[6]

over the EU, with DE, NL; FR, DK and BE being the only countries to match the US in agricultural productivity

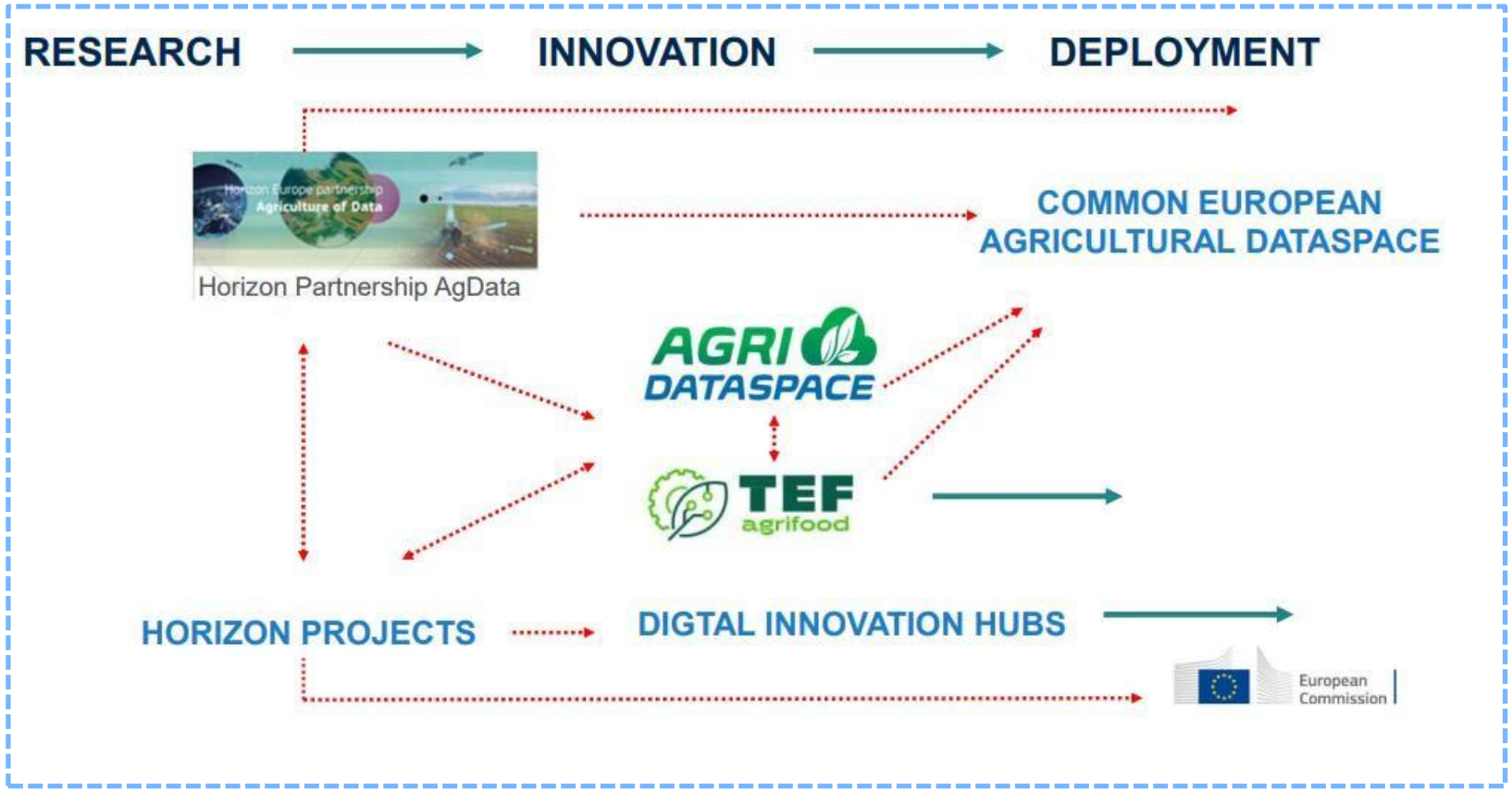
Market for Agri digitalisation

€30 B EUR in 2029[7]

Growth from €18b in 2024 to €30b in 2029

Notes on sources: 1. Eurostat, October 2023; 2. Eurostat, May 2024; 3. Euronews, based on Eurostat data, February 2024; 4. Eurostat, April 2024; 5. CEMA Economic Reports 6. Eurostat 2024, 7. Forbes, 2023

EU level actions – *A lot has been launched …*



Private/ Public Investments in & effective use of Digital and Data infrastructure, Digital Tools

Impact

Horizon Europe

Other instruments

Digital Europe

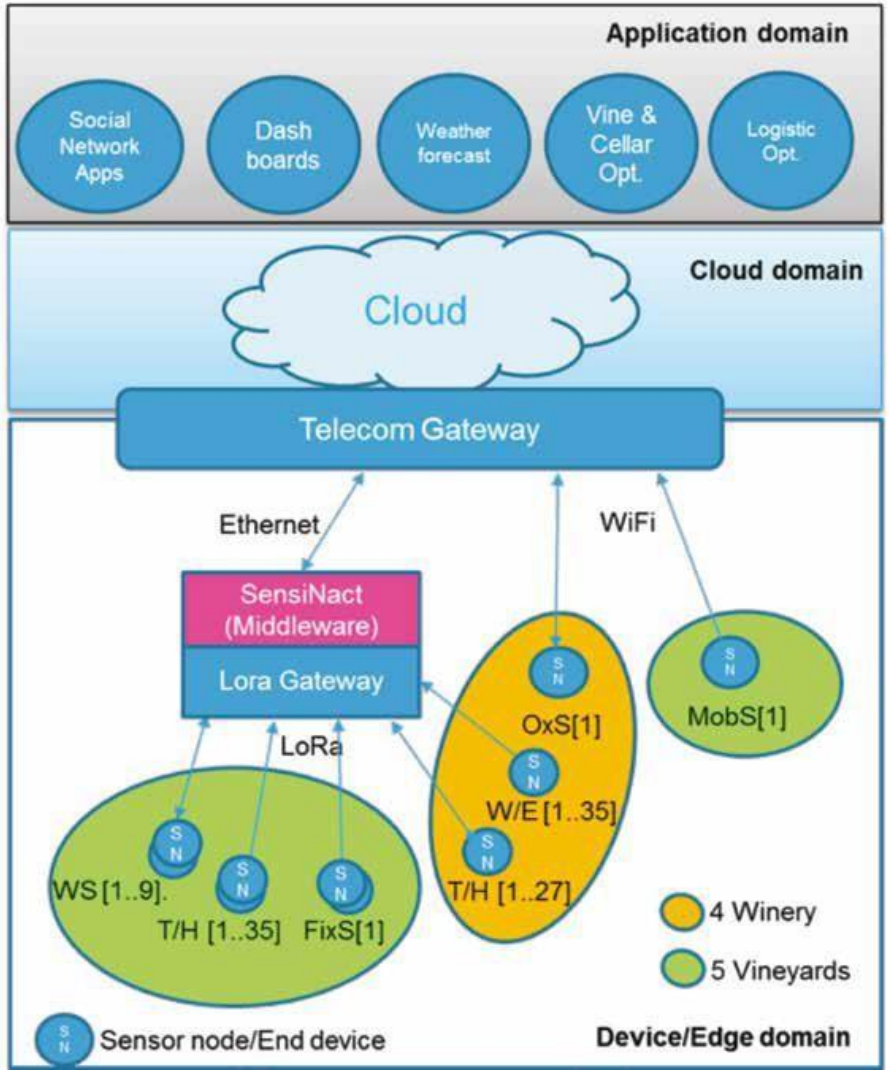
Connecting Europe Facility

Recovery & Resilience Facility

Common Agricultural Policy

European Regional Development Fund

The potential of agricultural data - Precision farming - Big Wine Optimisation



Horizon2020 project IoF (https://www.iot-catalogue.com)

Objective: Optimize the use of chemicals

Internet of Things (IoT) technology allows to monitor weather, vine conditions in real time; **150 sensor nodes** to gather data from 5 vineyards, covering 150 hectars

IoT System based on a LoRa private network:

- **Data gathering in real time** (weather conditions, vine phenological stages)
- **Big data analysis**
- **Decision-making** at anytime and anywhere through applications on **mobile devices**

Impacts

- Reduced pesticides costs - 20%, Reduced fertilizers costs - 20%,
- 3.4 liter portable water use reduction per liter product,
- Energy use reduction in processing stage, Reduction of GHG
- 400 Euro/ha Productivity gains
- Increased annual savings due to accident prevention

Selected challenges in the value chains in the digital transformation of the agri-food sector

- Insufficient investment capacities and lack of **cost effectiveness of digital tools**
- A high number of very small businesses as “end users”
- **Lack of trust in data sharing and/ or digital technologies and the “black box” of AI**
- **A limited number of actors with sufficient data for efficient AI application**
- **A limited number of providers of decision-making support tools** (which can run their business sustainably)
- **Lock-in effects**
- Lack of commonly acknowledged **standards and interoperability**
- Lack of **capacities to implement a number of novel legal acts** in the field of digital and data

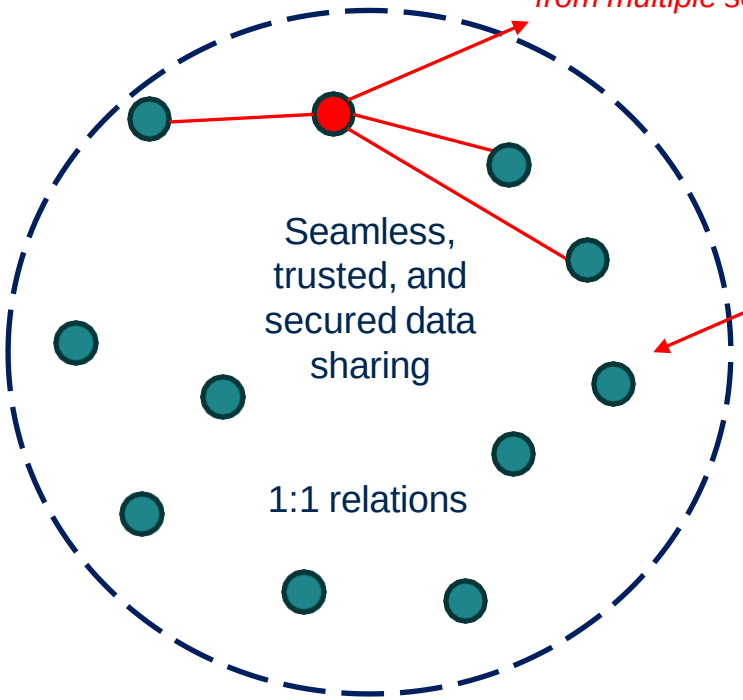
How achieving impact and delivering on policy objectives? - The example of data spaces and AI exploitation

Data sources/ Data holders

Public and private data
- IoT Data
- Farm attributes
- Production figures
- High value data sets
- Market data
- ….

- Farmers
- Manufacturers
- Public administration
- Logistic companies
- Dairies
- Fertiliser companies
- …..

Data space



„Critical mass of data“ from multiple sources

Data users

Start-ups, SMEs

Capitalisation through AI

Farmers, other actors along the value chain
Public administration

Farm advisors

Benefits

Decision-making support

Products, and services for
- Farmers
- Food processors
- Customers
- Manufacturers
- Policy-makers
- …..

Reduction of administrative burdens in B2B, B2G, and G2B settings

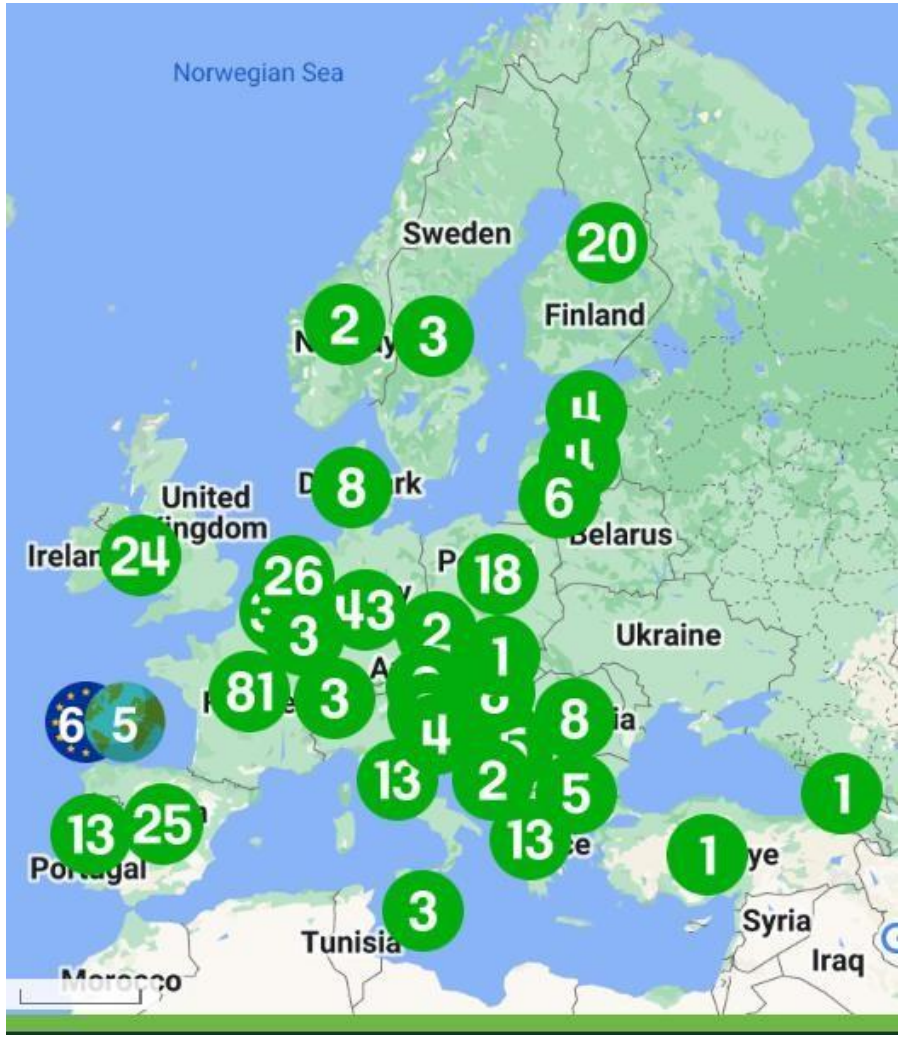
Personal advice

Benchmarking

Determinants for the success of data spaces

- Mobilisation of stakeholders
- Establishing of trust
- Interplay between stakeholders
- Model contracts under the Data Act
- Low “entry burden”, little administrative effort for users
- Relevance, quality, and quantity of data shareable
- Usability for start-ups to provide and scale data-based solutions and to provide cost-effective services

Data sharing initiatives in agriculture in the Europe



https://agridataspace-csa.eu/dsis-m

Paving the way: **Apply AI** strategy

OBJECTIVES

- Strengthen the sector's competitiveness
- Enhance sustainability, safety, resilience
- Reinforce our position in the global AI race

CHALLENGES

- Competition from other regions
- Accessibility and quality of data
- Affordable computing power
- Skills gap
- Compliance with legislation
- Ethics, security, safety, privacy
- Environmental impact

KEY ENABLERS

Regulation	Single market for data	Responsible AI	Fair digital markets	Diversified service portfolio
Deployment	Data ecosystems	Testing facilities	Investments in skills	
R&I	Digital enablers	Development & piloting of sectoral applications		
Infrastructure	HPC	Cloud-edge-IoT	Connectivity	Data spaces

Announcements

Publication of the study

"Boosting the twin transition in agriculture and a resilient innovation ecosystem – Standards and platformisation in the spotlight"

Released on the Commission website

Commission Expert workshop on AI in Agriculture

27 March 2025 (online)

If interested, please contact CNECT-E4-EVENTS@ec.europa.eu

European Digital Infrastructure Consortium (EDIC) in Agri-Food

- **Chaired by FR**
- ***Under preparation***
- ***Focal points:***
  - ***Reducing administrative burden***
  - ***Competitiveness & Sustainability***
  - ***Data sharing & accessibility***
  - ***Digital Farm ID***

Today‘s Agenda

Internet of Things (IoT)

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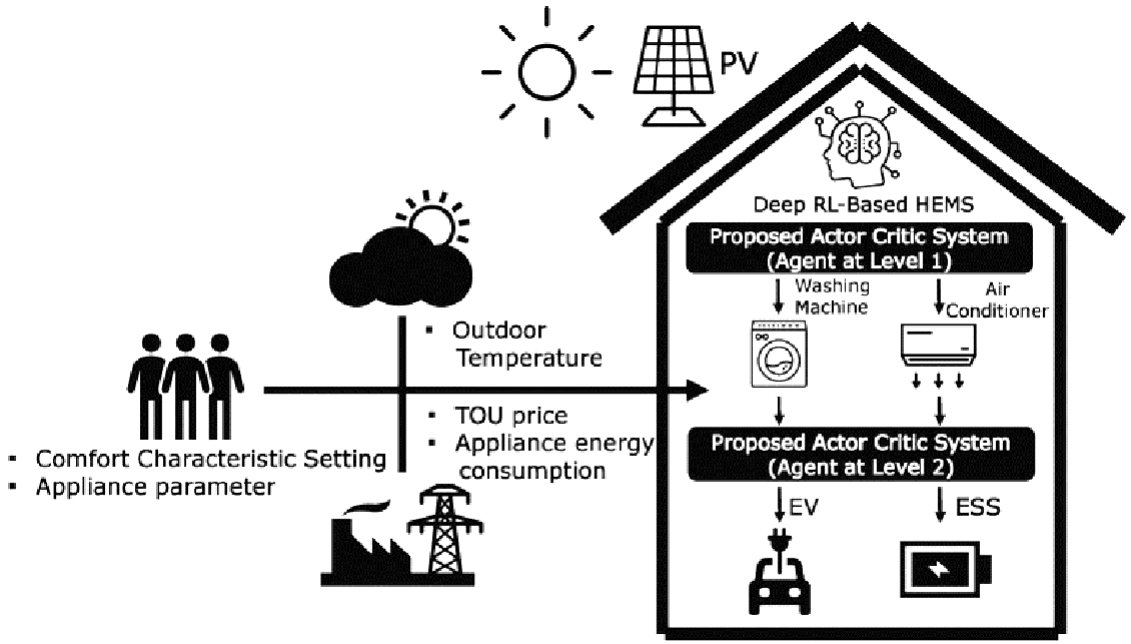
EU IoT Strategy

3C networks, Cloud-Edge-IoT pilots and selected verticals

Connecting the physical world

- The ‘Internet of Things,’ allows internet-connected devices and appliances to communicate.
- **Unmatched connectivity and scalability for real-time data management**
- Millions of daily data Points per device
- Ability to integrate seamlessly data streams of IoT devices
- Local AI-powered intelligence



IoT-Edge: Recommendations from the Draghi report

Challenges identified

Recommendations

IoT /Edge

the distribution of computational tasks across smaller nodes closer to customers, reducing data transport to smaller distances – is on the rise, with the business case being tested. Data localisation will be key to Europe's industrial digitalization

. As the EU builds highly automated manufacturing plants requiring low latency and significant data volumes steered by AI, **edge computing for industrial applications could better enable performance and reduce latency** for industrial connected robotics, keeping data transfers more secure.

Underpin leadership in strategic IoT areas (e.g. O-RAN, **edge computing, NW API standardization**) by **deregulating new investments** (5GSA, IoT), subject to preserving competition

Coordinate standards for edge, NW APIs, and IoT at EU level

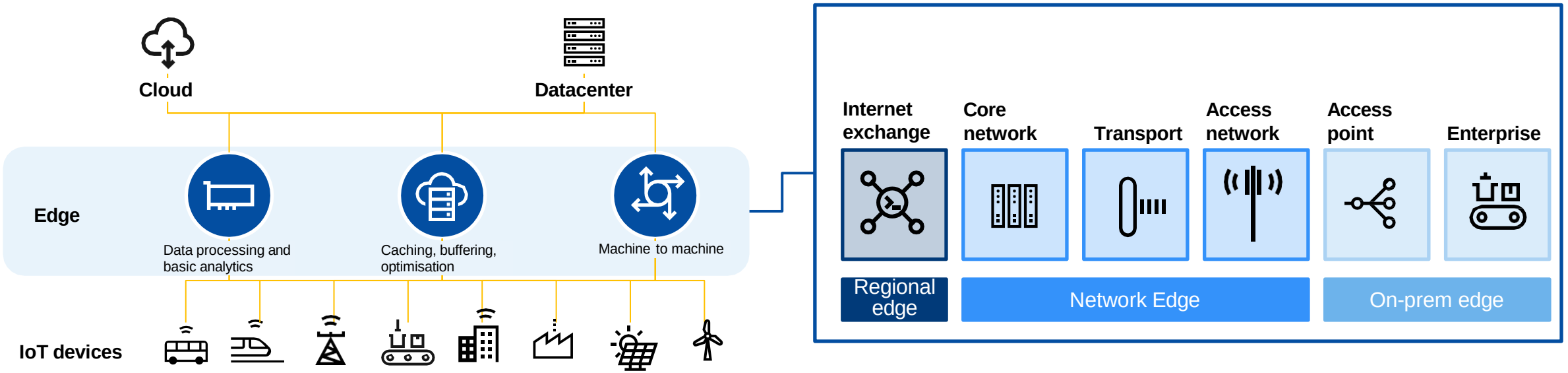
IoT (cross-domain)

Connecting advanced technologies, such as the internet of things (IoT) and remote sensors, additive manufacturing and predictive maintenance has great potential to promote the circular economy and energy savings

Digital technologies are highly complex, and building up expertise and capabilities in them is difficult, time-consuming and **requires coordination of different business actors.**

We are experiencing a large-scale telco-edge-IoT convergence

Edge computing



Seamless computational fabric across the computing continuum to re-define cutting-edge, innovative industrial services

Combined **precision** of edge computing with **sophisticated gen-AI training** in the cloud enables next-gen **intelligent and low-latency** applications

Integrated **gen-AI processing capacity** on nodes enables new de-centralised intelligence paradigms

High edge computing capacity enables **gen-AI-driven immersive industrial environments**

Source: STL partners

Capacity building through open innovation and technology capabilities – the **3Cs network**

Context

With a February 2024 White Paper the Commission launches a broad consultation of Member States, civil society, industry, and academics, to collect their views on the scenarios

Key conclusions

Foster a vibrant community of European innovators, creating the "Connected Collaborative Computing" Network ("3C Network"), an ecosystem that spans semiconductors, computational capacity in edge and cloud environments, radio technologies, to connectivity infrastructure, data management, and applications

1

Innovation

Build on leading position in shaping mobile communication standards and leverage it to the broader supply and value chain for edge and cloud computing

2

Coordination

Today's connectivity providers become tomorrow's providers of collaborative connectivity and computing, capable of **orchestrating the different computing elements** that this ecosystem requires

3

Investment

The transformation of the EU's connectivity industry requires significant investment into **cloud, edge, and AI capacities**

Note: Whitepaper – How to master Europe's Digital Infrastructure needs, February 2024

Bridging supply + demand:
An integrated 3C Service and Application infrastructure

3C Service Infrastructure (Supply side)

Cloud computing and Telco edge layer

- **Infrastructure**: Computing, networking, storage
- **Industry**: Hyperscalers, Cloud providers, Data Center providers, Telcos

Strategic dependence on non-EU players

3C Application Infrastructure (Demand side)

Smart IoT and industrial device layer

- **Infrastructure**: Smart Devices, IoT nodes
- **Industry**: Sectoral/x- sectoral industrial actors and integrators

Key EU industry competence and strength

Goal: Integrated 3C Service and Application Infrastructures driven by industrial EU Actors

Intelligent

Immersive

Sustainable

Autonomous

European Commission

Example of IoT in verticals - Automotive Action plan

Digital topics feature heavily in the Strategic Dialogue and Automotive Action Plan

Ursula von der Leyen
President

Jan 30 – Kick-off
Mar 3 – Closing with Pres VdL

Henna Virkkunen
EVP

Stephane Séjourné
EVP

Roxana Mînzatu
EVP

Wopke Hoekstra
Commissioner

Apostolos Tzitzikostas
Commissioner

Dialogues with 5 other EVPs/Commissioners

Feb 17, Strategic Dialogue with EVP Virkkunen

26 participants, 4 Focus topics

1) *Software-Defined Vehicles (SDVs) for connected, automomous, and electric mobility*
2) *Automotive Hardware and critical technologies*
3) *Data Access and Pooling*
4) *Regulatory simplification*

*Hand-over of the "**Declaration to collaborate on an EU Software-Defined Vehicle**" signed by 15 OEMs, Tier 1 suppliers, and DE, FR, IT Automotive associations*

March 5 – Publication of the Action Plan for Automotive

The outcome of this dialogue will be a comprehensive Action Plan

5 Chapters:

- Innovation and Digitalisation
- Decarbonisation
- Competitiveness and supply resilience
- Skills and Social dimension
- Level playing field and business environ.

European Connected and Automated Digital Vehicle Alliance

Chips JU

Hardware

In-vehicle computing

Future-proof adaptable, flexible, energy-efficient computing platform, integrating more advanced processors, including AI chips

Joint standards

Software

SW-Defined Vehicle (SDV)

EU-wide, open platform on SDV based on state-of-the-art open-source SW building blocks, interfaces, standards and tools

Joint standards

Apply AI – HE Cl 4 and 5

AI models

Innovative AI solutions

Sector-specific (gen) AI models, algorithms, and agent frameworks that allow e.g. autonomous driving, optimising operation of connected vehicles, effective battery-management, or predictive maintenance

CCAM

Auton. driving

Transition to AV

Develop and Deliver a technology roadmap for the development of shared **Autonomous Driving System** (ADS) components (software and hardware).

Cross-Programme

Testing

Large-scale pilot facility

Facility to be started in 2026/27 as a collaborative environment for industry for **Software-Defined Vehicles and AI engineering** and as a testbed for innovation in application layers

EU needs to build its own industrial capacities for the SW and IT hardware needed for clean, connected and automated vehicles.

The Alliance will build on the preparatory work of the European Vehicle of the Future Initiative, and Horizon Europe automotive-related Partnerships

SDV Ecosystem and Manifesto

Participants in Chips JU projects
HAL4SDV and FEDERATE

Automotive OEMs
- BMW
- DAIMLERTRUCK
- FORD OTOSAN
- MERCEDES-BENZ
- RENAULT - AMPERE
- STELLANTIS
- VOLVO TRUCK
- VW - CARIAD

SW dev.tool providers
- AVL
- DASSAULT
- ECLIPSE EUROPE
- FEV
- METIS BALTIC
- TERAGLOBUS
- TRUSTINSOFT
- VECTOR
- VERUM

Semiconductor companies
- ARM
- CAE List
- INFINEON
- NXP
- ST MICROELECTRONICS

Automotive Tiers
- ACCENTURE
- BOSCH - ETAS
- CONTINENTAL - ELEKTROBIT
- CRITICAL SOFTWARE
- DIMECC
- FORVIA
- MICHELIN
- OP'nSOFT (OPMobility)
- RESILTECH
- ROVIMATICA
- SYSGO GMBH
- TENSOR EMBEDDED GMBH
- TTTECH
- VALEO
- VITESCO
- ZF

Industry
- ANFIA
- AUTOSAR
- COVESA
- EUCAR
- PFA
- VDA
- VDI/VDE-IT

Academia & RTOs
- AGEN.EST.CON.SUP.INV.CIENT.
- ASTAZERO
- BARCELONA SUPERCOMP.CENTER
- COMMIS.ENERGY
- DLR
- FRAUNHOFER-IKS
- FZI
- INRIA
- INSTITUTO SUPERIOR PORTO
- KIT
- POLITECNICO DI MILANO
- POLITECNICO DI TORINO
- RWTH AACHEN
- TU Berlin
- TU EINDHOVEN
- TU LULEA
- TU MUNICH
- UNI OSTRAVA
- UNIV BOLOGNA
- UNIV.COTE AZURE
- UNIV.STUTTGART
- UNIV.UOLU
- UNIVERSITA MODENA E REG.EMILIA
- VIF

[SDVoF Vision and Roadmap]

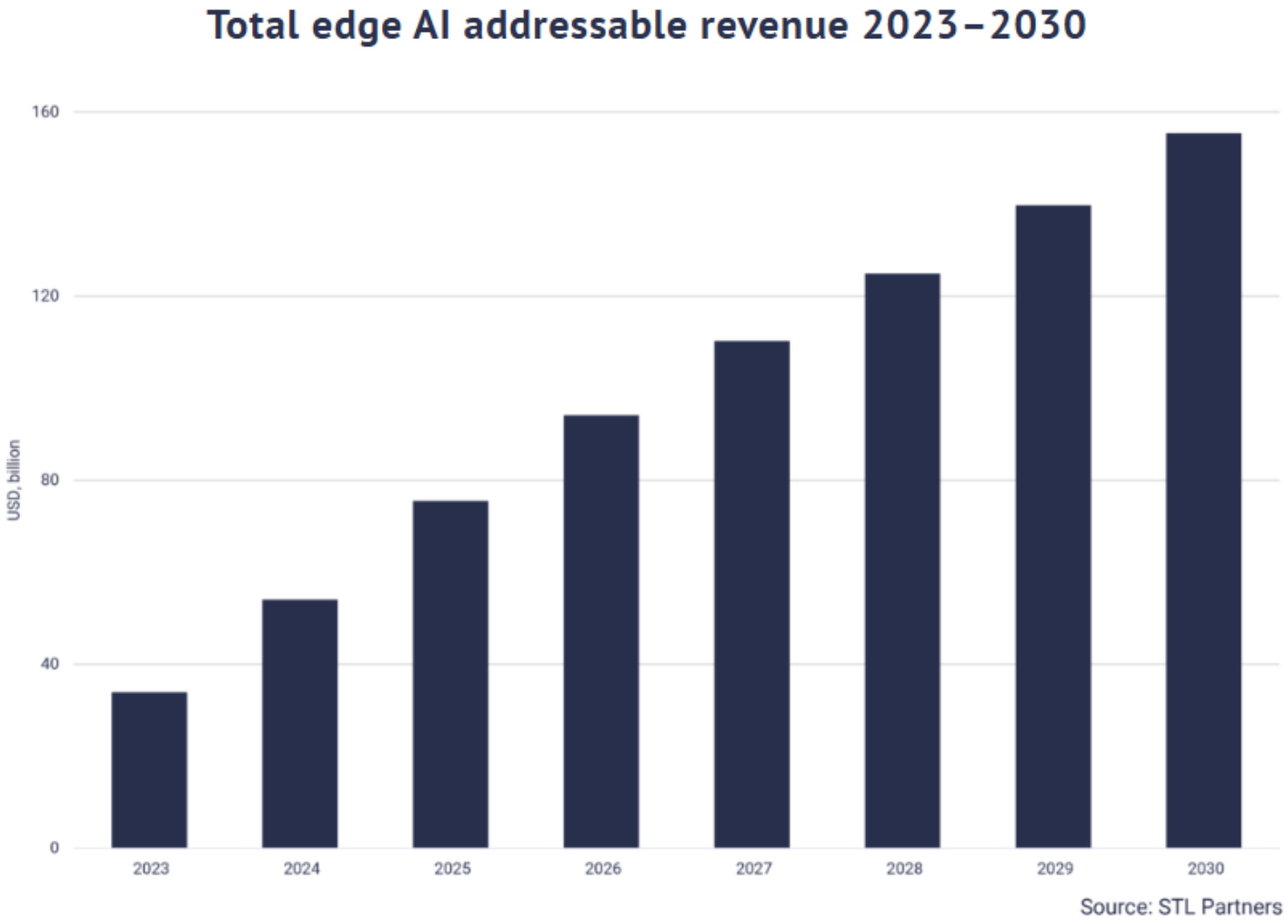
Declaration signatories

"Collaboration on a European Software-defined Vehicle of the Future Ecosystem"

OEMs	Renault Group	**Henry Bzeih**, Vice President SW & SWS
OEMs	BMW GROUP	**Dr. Christoph Grote**, SWP Electronics and Software
Associations	ANFIA	**Roberto Vavassori**, President
Associations	PFA Filière Automobile & Mobilités	**Luc Chatel**, President
Associations	VDA Verband der Automobilindustrie	**Hildegard Müller**, President VDA e.V.
Tiers	AVL	**Prof. Dr. Helmut List**, CEO
Tiers	Continental	**Giles Mabire**, CTO Automotive
Tiers	ETAS BOSCH	**Dr. Thomas Irawan**, President
Tiers	FORVIA Inspiring mobility	**Christophe Aufrere**, SVP, CTO
Tiers	MICHELIN	**Eric Vinesse**, EVP, R&D
Tiers	OPmobility	**Alexandre Corjon**, EVP, Innovation & SW
Tiers	TTTech	**Dr. Stefan Poledna**, President
Tiers	Valeo	**Christophe Le Ligné**, CTO
Tiers	ZF	**Dr. Dirk Walliser**, SVP Corporate R&D

Market Prospects: AI will stimulate more revenue at the edge

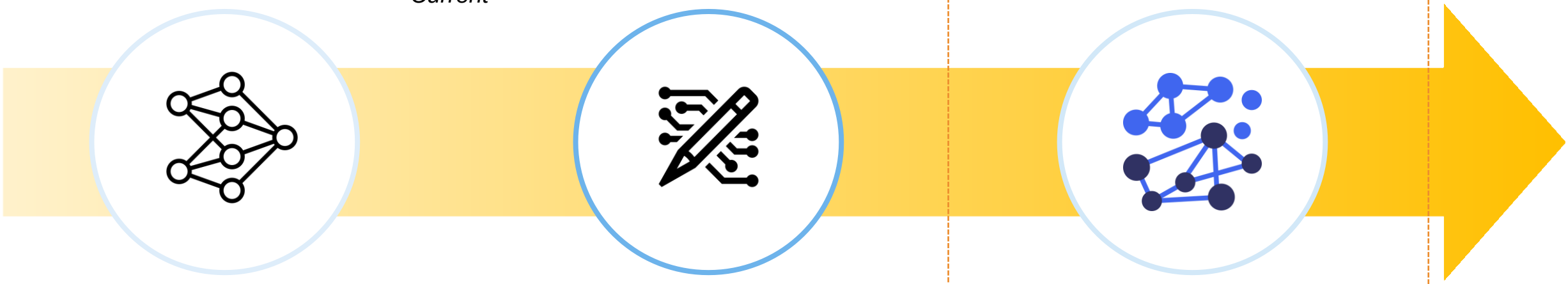
- STL edge AI market forecast predicts to reach **USD157 billion by 2030**.
- In the short term this market will largely be driven by *computer vision use cases*.
- Increasing proportion of edge infrastructure being driven by *inferencing for fine-tuning of domain-specific AImodels*.



Where EU opportunities lie: Sector-specific AI applications and LLM models for value creation

Current

Future



Generalist LLMs

OpenAI Claude MISTRAL AI_

Generic LLMs (e.g., GPT 4.0; Claude 3.5) have **exhausted public training** data

They fail to represent complex, domain-specific industry needs

Expected commoditization

Detailed LLMs from AI/ML PaaS

Amazon SageMaker GCP Vertex AI Azure Machine Learning

Industrial users develop more detailed LLM models based on Hyperscaler **generic tooling** (test beds, model optimization, etc.) & **Generic PaaS** (databases, data lakes)

Key EU disadvantage vis-a-vis hyperscalers

Sector-specific LLMs

Domain-specific LLMs trained on specific industry data

Models capture unique demands and needs of **distinct business domains**

Potential differentiator for EU industry who is data holder… if we are fast

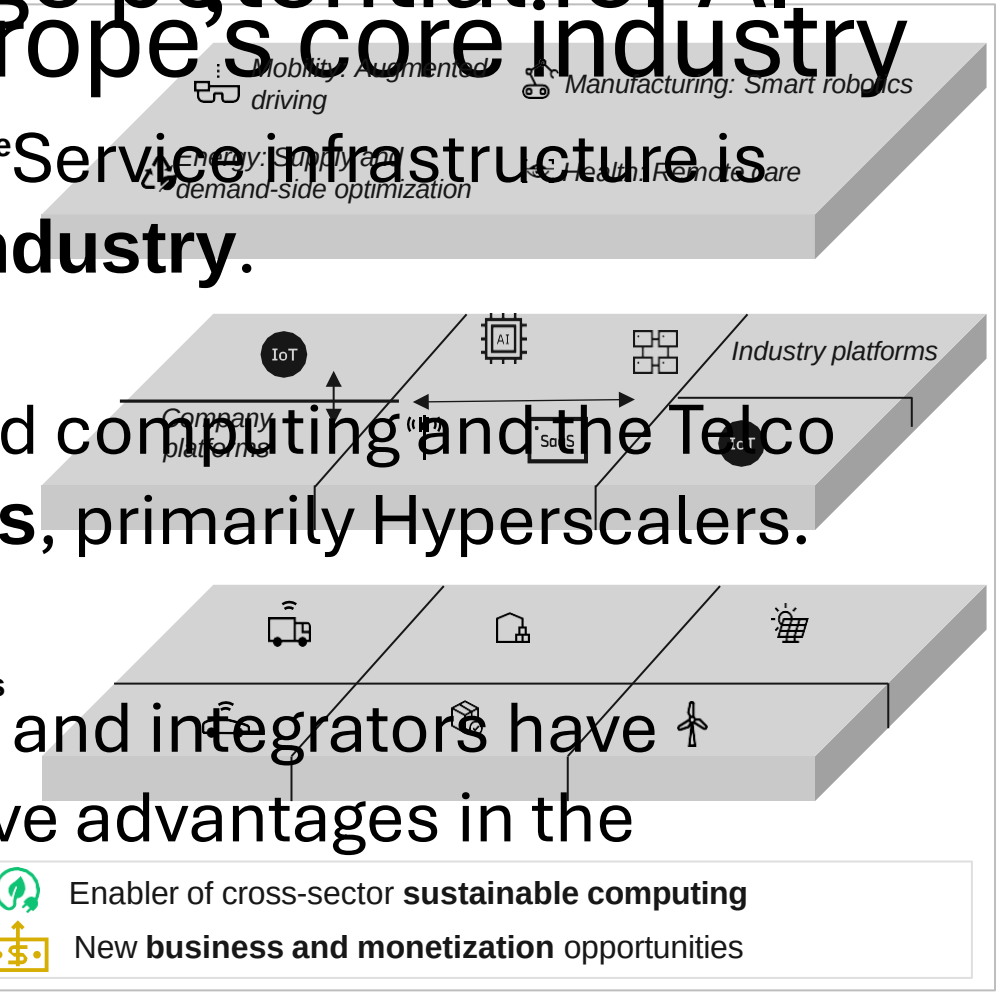
Appendix

Decentralized intelligence is the foundation to realize the huge potential for AI and generative AI across Europe's core industry

– The convergence of 3C Application and Service infrastructure is a **strategic opportunity for the EU industry**.

– 3C service infrastructures such as cloud computing and the Telco edge are **controlled by non-EU actors**, primarily Hyperscalers.

– On the other hand, EU industrial actors and integrators have d competitive advantages in the **er**.

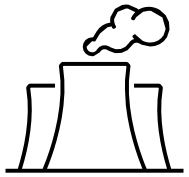


– Decentralized intelligence is the foundation to realize the huge potential for AI and generative AI across Europe's core industry

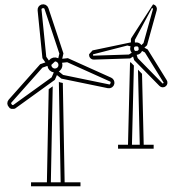
– As networking and computing infrastructures converge, de-

Smart grid creates transparency

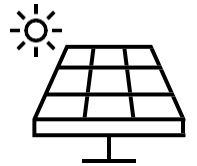
allowing consumers to choose optimal energy source for current weather conditions



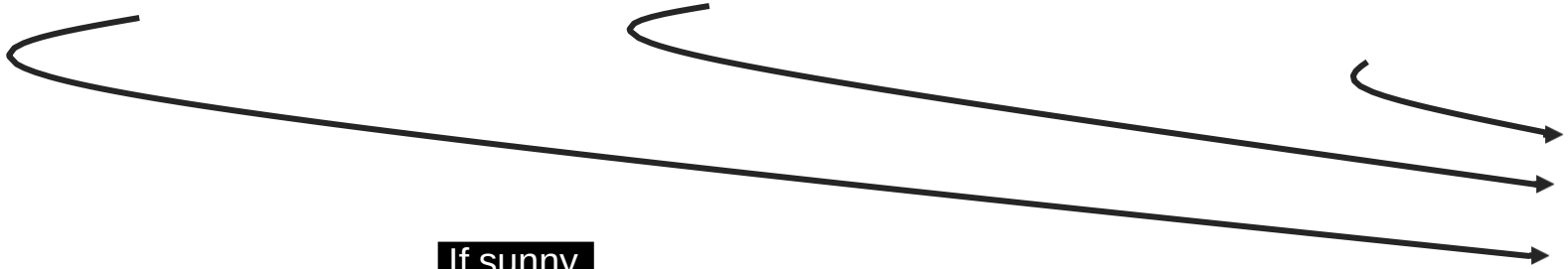
Coal power plant
3500 GWh

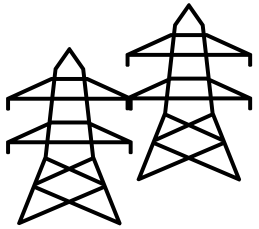


Wind power plant
1 GWh



Photovoltaic power plant
100 GWh



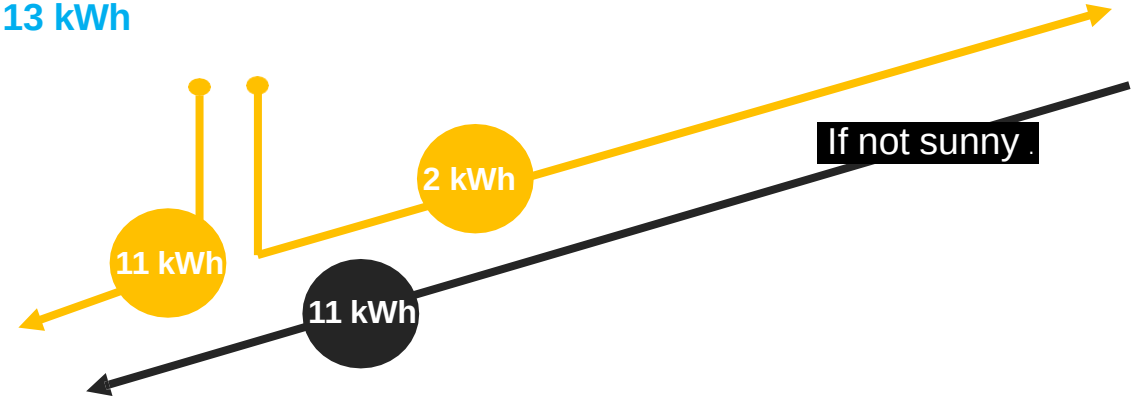


Distribution system

If sunny .

Domestic power production
13 kWh

Needed energy 11 kWh

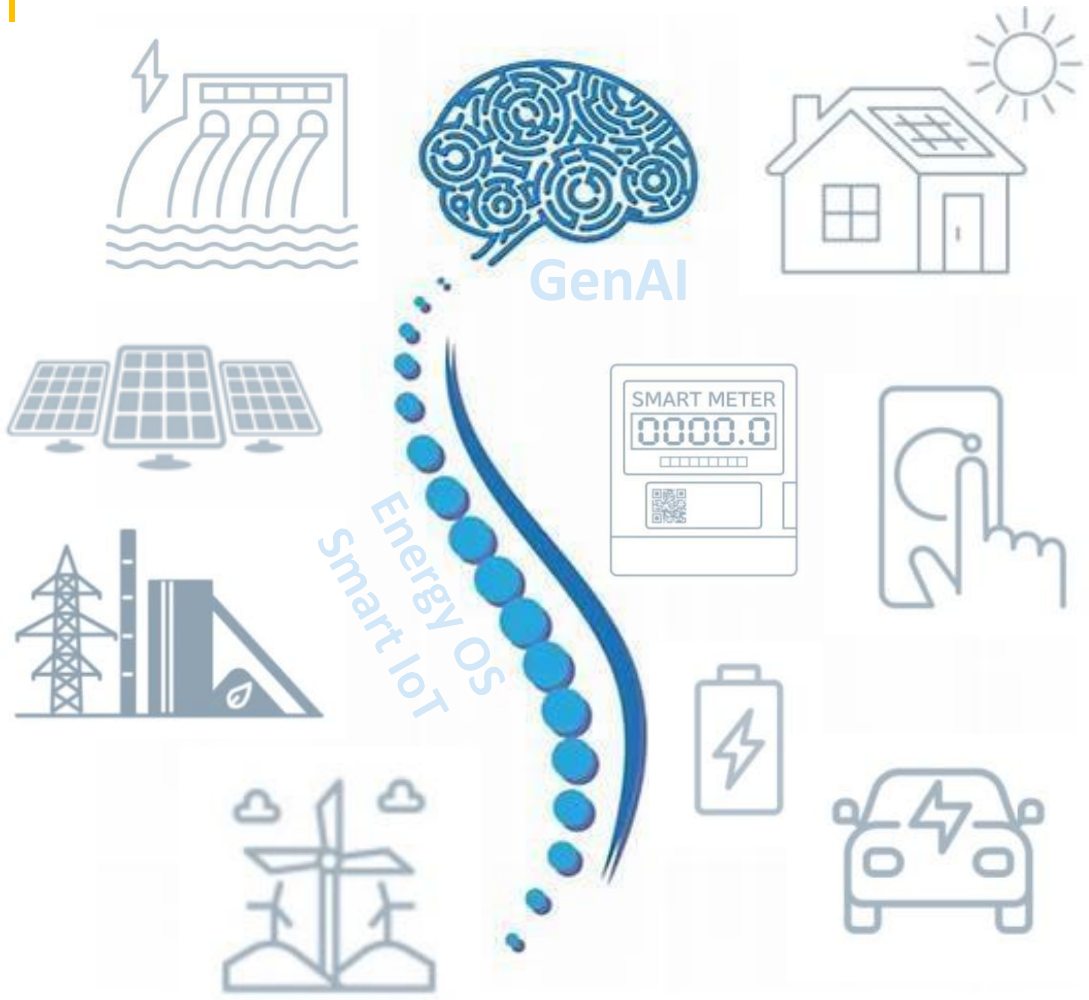


If not sunny .

Energy Mobility Agriculture

Example of a generative AI « lead application » in the energy sector:

Towards a digital spine **of the EU's energy** system powered by GenAI



The power of Generative AI

(and foundational models):

- **Scenario generation & simulation**
- **Time series forecasting**
- **GenAI Decision-making models**

Digital Twin

Energy Data Space

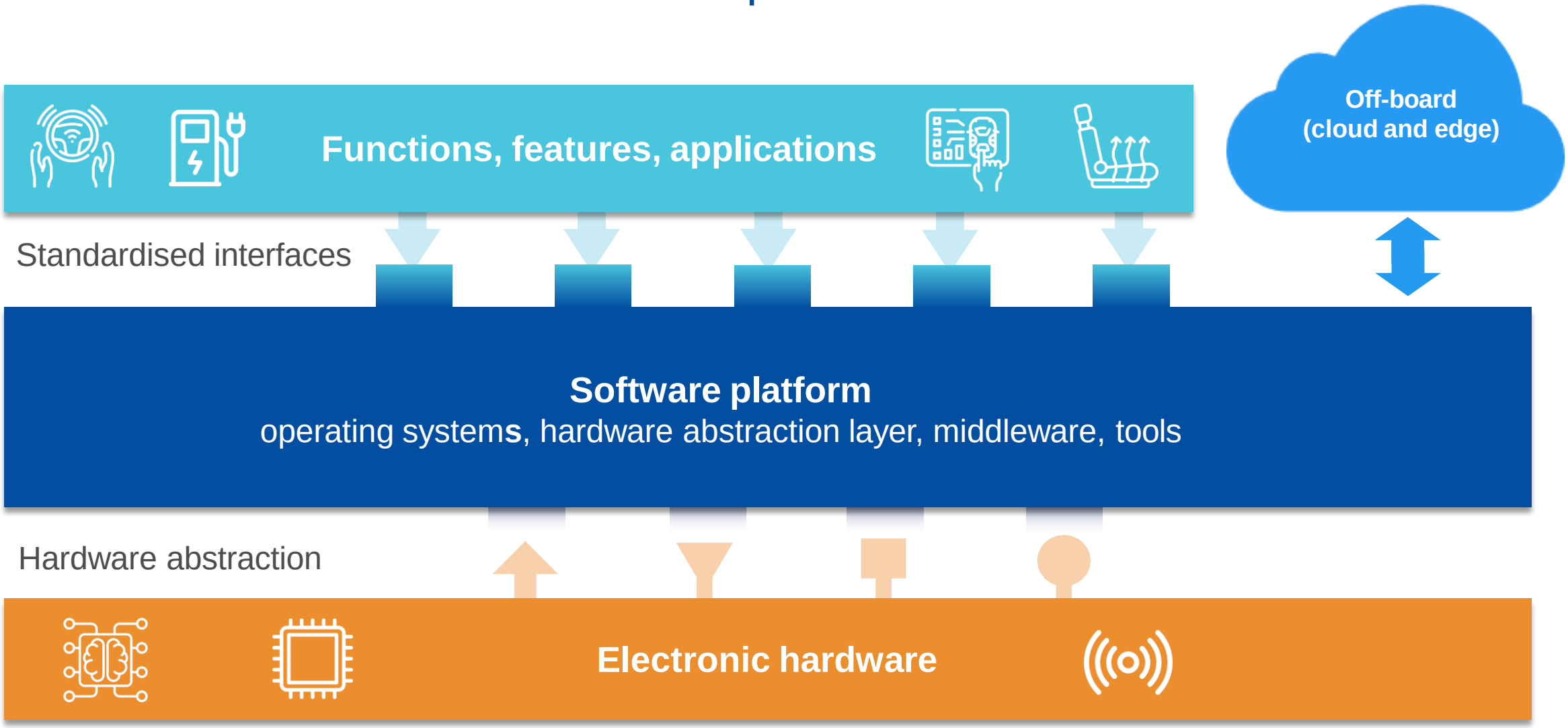
Supply – demand side optimisation:

- **Harness flexibility - shave peaks**
- **Reduce carbon footprint**
- **Empower industry & consumers**
- **Increase security of energy supply**
- **Reduce energy prices**
- **Support EU supply industry**

Open platforms:

ecosystem – market place – standards – piloting

The role of a SW-defined vehicle platform



Agriculture: Current state and drivers of digitalisation

Adoption rates of digital technologies

Key digital technologies implemented

- Precision farming
- IoT and sensors
- AI and data analytics
- Drones and satellite imaging

Primary drivers

- EU policy support (farm to fork, CAP)
- Economic incentives and funding
- Technological advancements
- Sustainability goals

Energy Mobility Agriculture

Complementarity of EU programmes: Examples in the fields of digitalisation and AI

Policy instrument/ Programme	Scope	Examples	Comments
Horizon 2020/ Horizon Europe	**Research & Innovation**	Large-scale pilot projects with demonstration power Tailored themes, e.g. on digitalisation on small farms **Partnership Agriculture of Data**	Under Horizon Europe, especially Clusters 4 and 6 are relevant
Digital Europe Programme	**Innovation & Deployment** **Capacity building**	**Common European Agricultural Data Space** European Digital Innovation Hubs **Testing and Experimentation Facilities for AI** Advanced Digital skills	Strong EU-level focus
Common Agricultural Policy	**Application** Capacity building for "end users" Innovation	Advisory services & Training Investment support Agricultural Knowledge and Innovation System, European Innovation Partnership (EIP)-AGRI	Link from EIP-AGRI to network of Digital Innovation Hubs
CEF and RFF	(Large-scale) projects in digital and data infrastructure	Investments into 5G use cases and broadband roll-out	
European Digital Infrastructure Consortium (EDIC)	**Long-term investments into and deployment of d**igital and data infrastructure	**Digital Farm ID** as key enabler for B2B, B2G, G2B data sharing and subsequently for data for AI applications	Foundation of legal entity by MS EU-level/ Multi-Country focus