From Cloud to Edge to IoT

NGIoT Workshop

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HORIZON 2020

Key Challenges and EU tools

Challenges	EU Tools
GREEN Air quality, decrease CO_2	**Legislation:** CO_2 target, Charging infrastructure target, Public Procurement, Emission Trading Scheme, Sustainable and Smart Mobility Strategy **Support new tech (Electrification, hydrogen):** Horizon Europe, IPCEI (e.g. batteries), RRF, CEF (infrastructure)
DIGITAL Widespread connectivity, safe automation, fair data sharing, cybersecurity, **software platforms ("OS"), advanced chips**	**Legislation**: Car legislation on automation, cyber and access to car data, Data act, European Rail Traffic Management and interoperability, Autonomous maritime systems, Vessel Traffic Monitoring and Information Systems **Support New tech:** 5G/**edge**, AI, data space, IPCEI (e.g. **microselectronics**)
GLOBAL COMPETITION Fair competition and market access, resilience	**Trade and competition instruments**: Access to third country markets and level playing field (FTAs, FDI screening, White Paper on levelling the playing field as regards foreign subsidies), Competition policy (Fit for purpose in a global environment), harmonised standards

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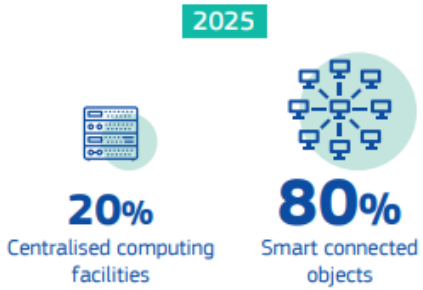
From Cloud to Edge to IoT for European Data

STATUS

- Low use of cloud technologies by European companies
- Three quarters of the European cloud market is dominated by players with Headquarters outside the EU.
- 80% of data processed centrally

Where will data be processed in the future?



OBJECTIVE

- European value chains in the computing continuum
- Europe's strength in sensors, systems and applications (KDT)
- Europe to ride on the new wave of innovation at the edge and far edge

Impacts:
#21 (Data)
#20 (Industrial leadership and autonomy)
#22 (Digital and emerging enabling technology sovereignty)

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Data + Connectivity:
From small islands to Big (cloud) Empires

- Use European **Power @theEDGE**
- Respond to Commoditization of key European Industry
  (scale of Data Analytics and Prediction)
- → **Join Forces at European Scale**

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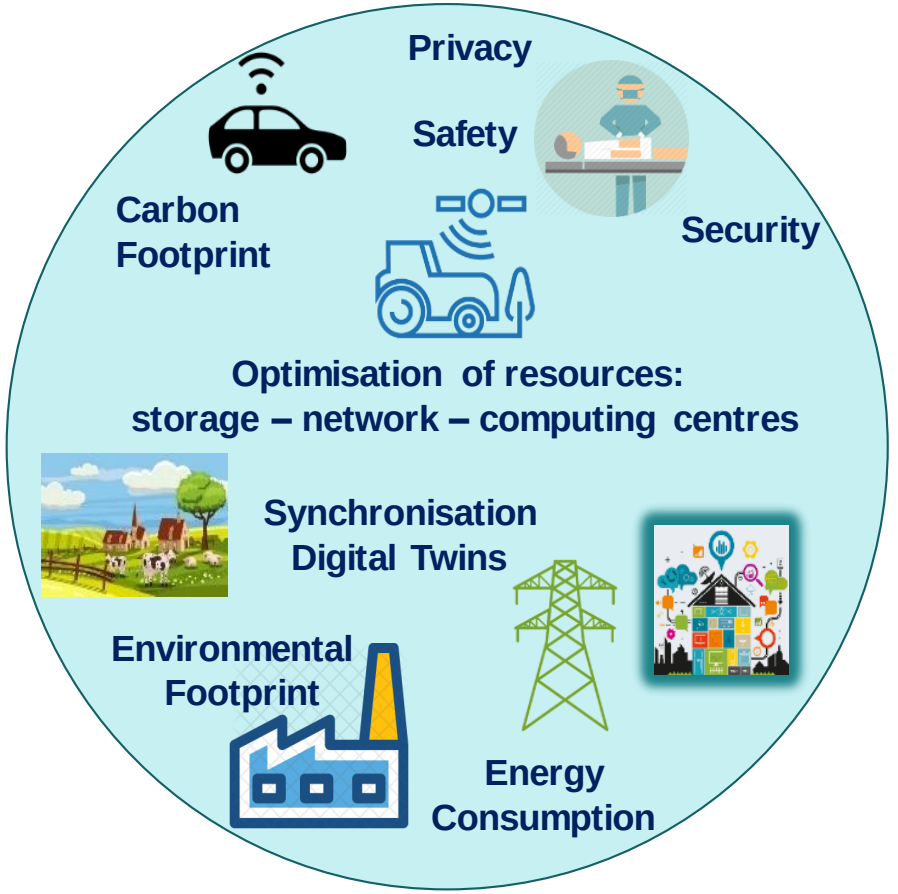
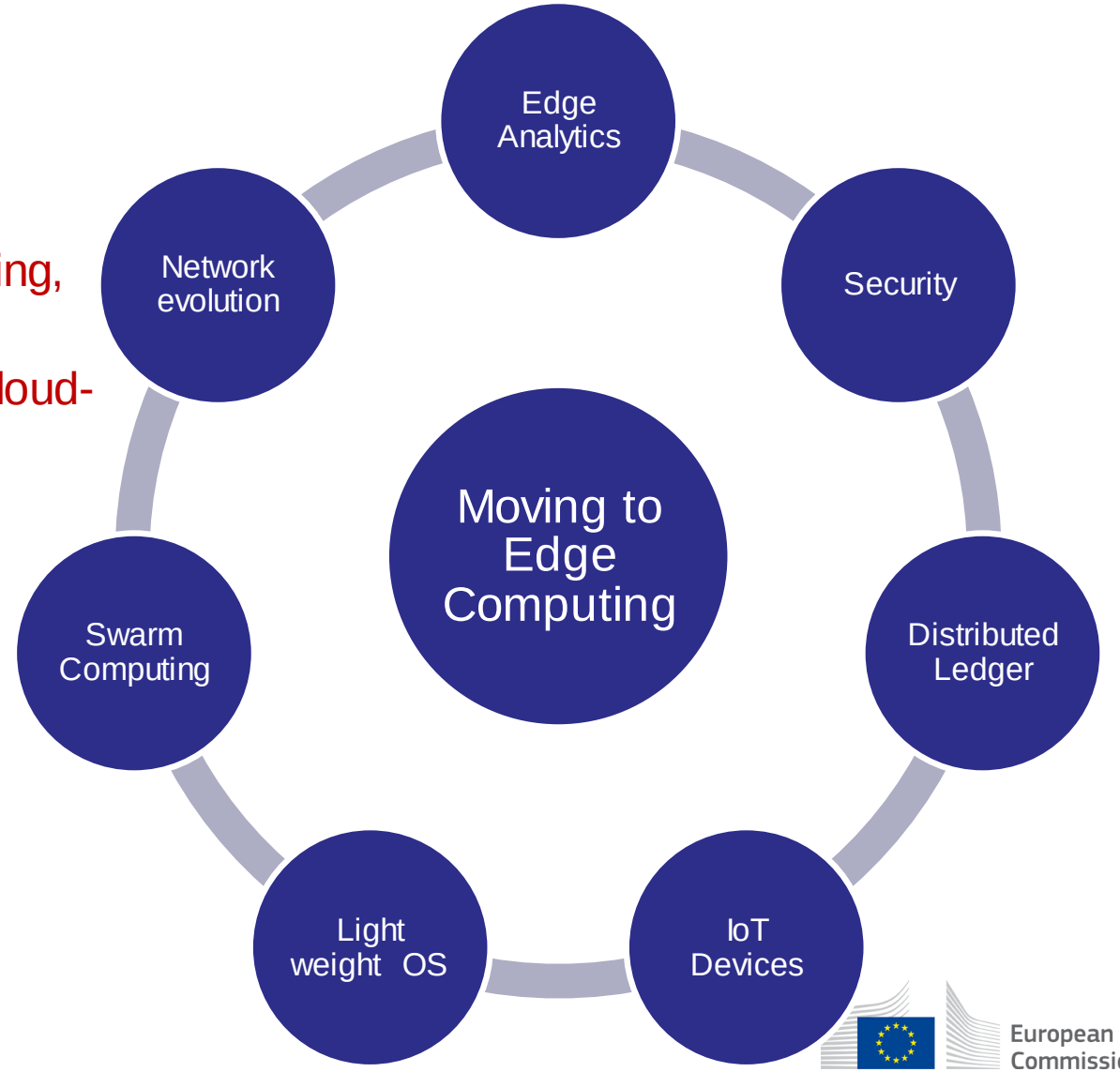
Strategic dimension of Cloud- Edge - IoT

- **Recover** from ever increasing dominance of hyperscalars in industrial applications
  - Avoid commodization of IoT
  - Building on European industrial strengths
- **Transform** Europe‘s industrial IoT infrastructure capitalising on
  - 5G connectivity
  - Next generation of smart devices with strong computing capacity at the edge
  - Sectoral data spaces
- **Enable** the emergence of a „beyond cloud“ era
  - Bringing computing capacity to the data: green, real-time, cost
  - Swarm computing: decentralised intelligence at the “far“ edge
  - 5G edge cloud services
  - Increased privacy and security

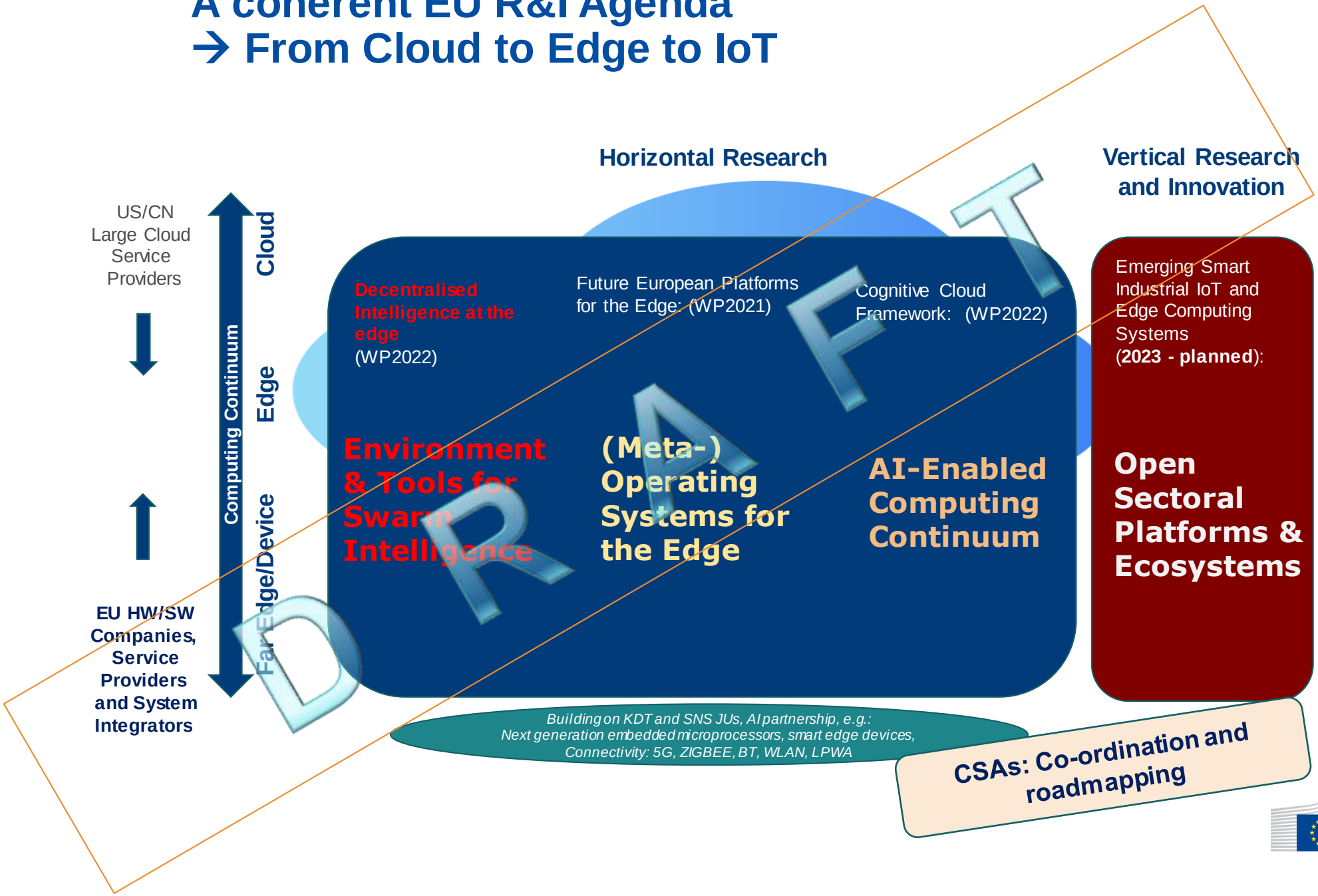


Far Edge:
Towards Ubiquitious Decentralisation

- Architecture Challenges
  - A **glue between Cloud and Control**
  - Swarm intelligence: distributed reasoning, context awareness
  - **A new OS** for orchestration between cloud-edge-devices
  - Device integration at system-level
  - Build on 5G campus / mesh topologies
  - Dynamic functions '**over the air**'
- Edge Nodes
  - Build on progress in low-energy data processing
  - Integrate AI/ML algorithms at the edge
  - Agile, open programming environment



A coherent EU R&I Agenda
→ From Cloud to Edge to IoT



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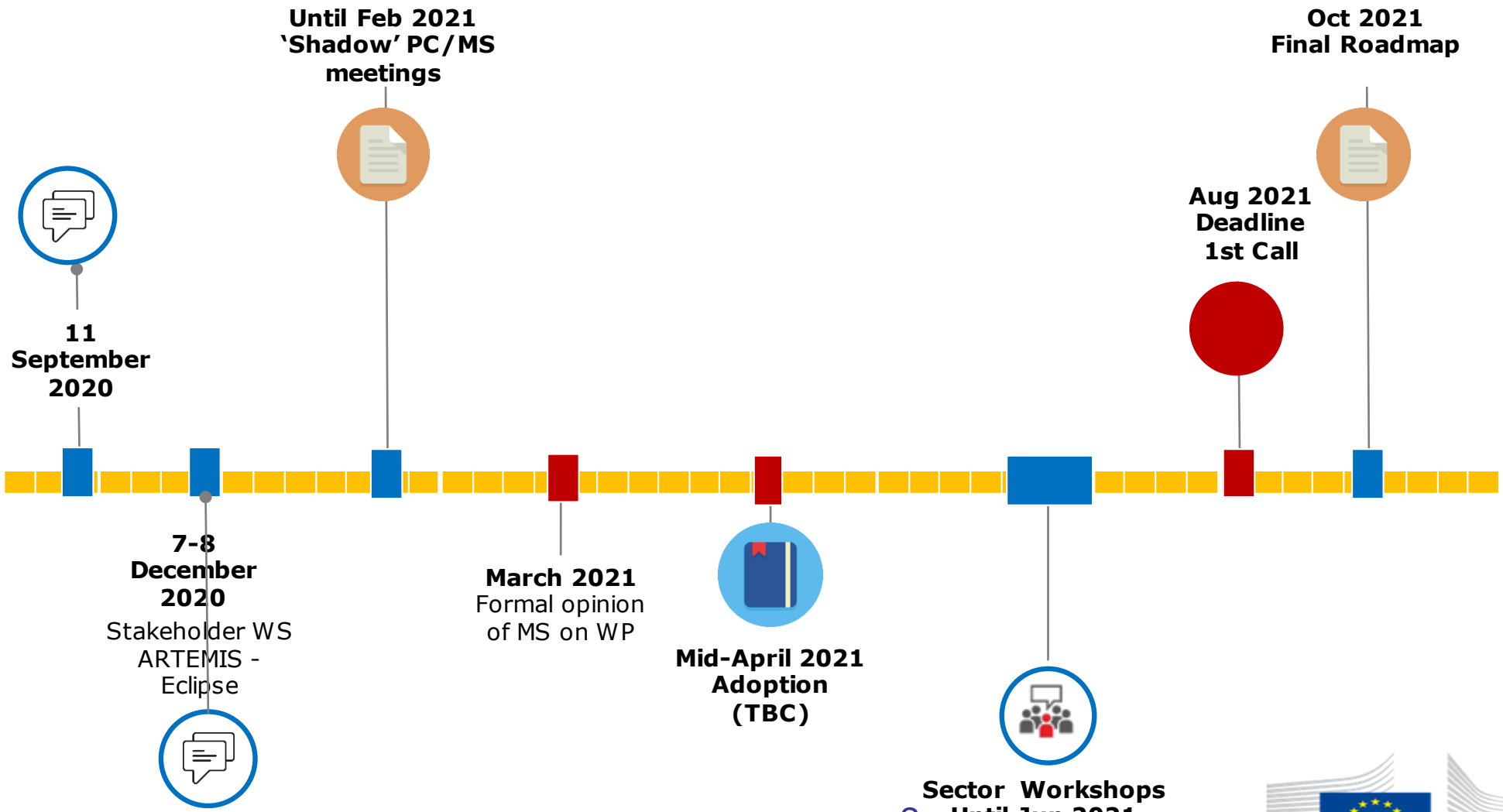
INTRODUCTION and TIMELINE

TIMELINE



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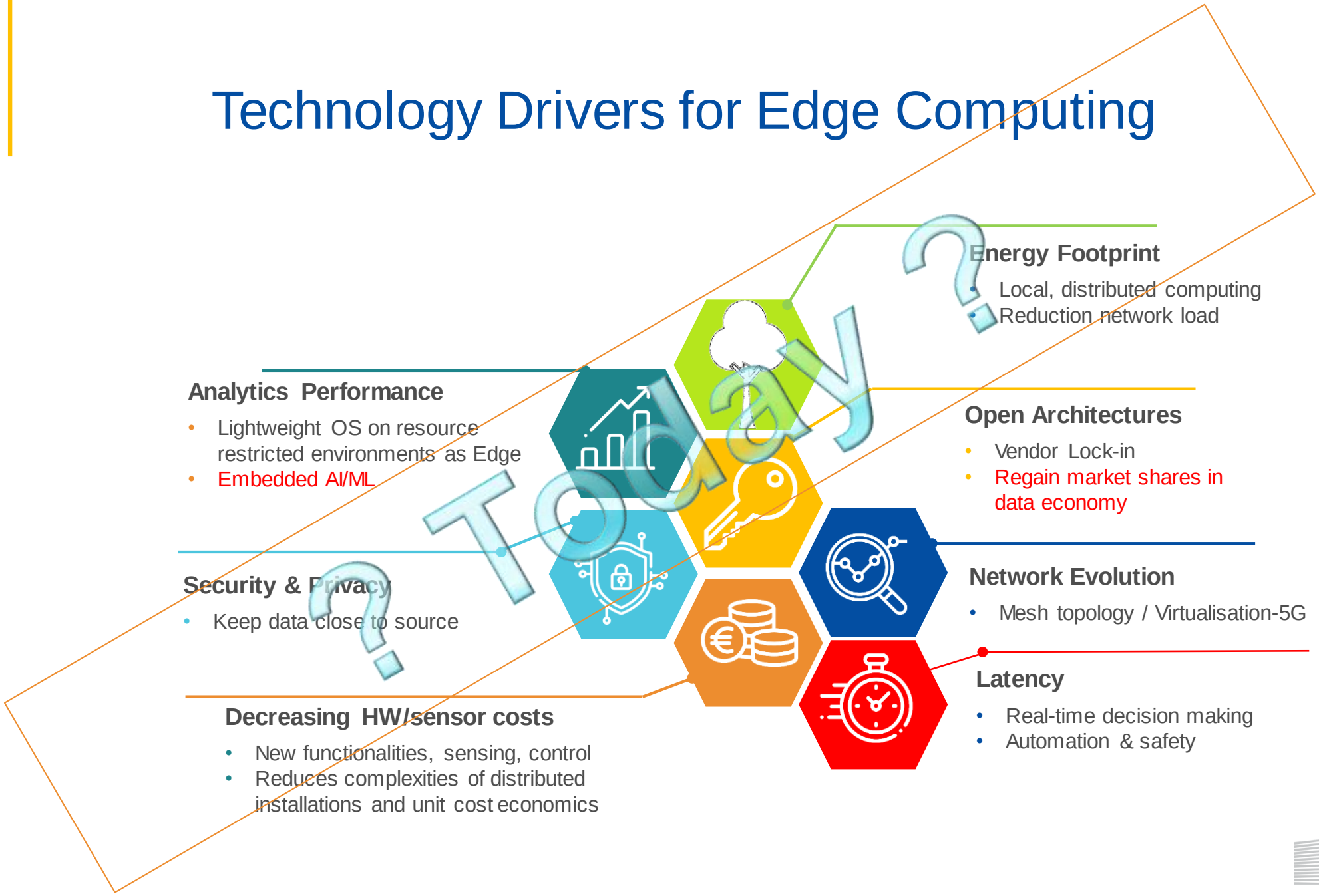
Technology Drivers for Edge Computing



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THANK YOU

Useful links:

- **European Data Strategy**:
  https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy

- **ARTEMIS White Paper: From IoT to SoS**:
  https://artemis-ia.eu/news/whitepaper-from-iot-to-sos.html

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

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

- NGIOT CSA **Workshop IoT-EDGE on 11/09/2020**:
  → **www.NGiot.eu**