



The Chips Act including some reflections on the mobility and the energy sectors

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Chips Act: Context

Limited advanced industrial strengths



Strategic dependencies in security of supply



Detrimental effect across industries

In an EU with...

- Limited capabilities in manufacturing
- Insufficient industrial expertise in manuf. at < 20 nm
- Minor role in chip design

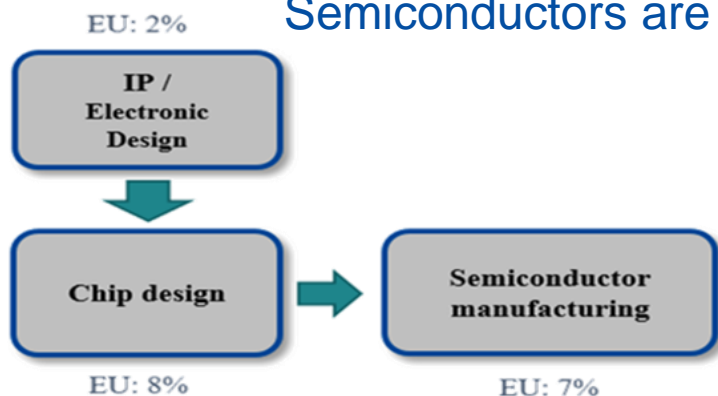
In a world with ...

- Concentration of production in Asia (Taiwan, Korea, China)
- Geopolitical tensions (e.g. South China Sea)

Leading-edge semiconductor technology is central to...

- Health
- Energy
- Defence
- Automotive
- Industrial automation
- ...

Semiconductors are key to achieve green deal objectives and ensure security and safety



Bloomberg

Politics

Top Economist Urges China to Seize TSMC If US Ramps Up Sanctions

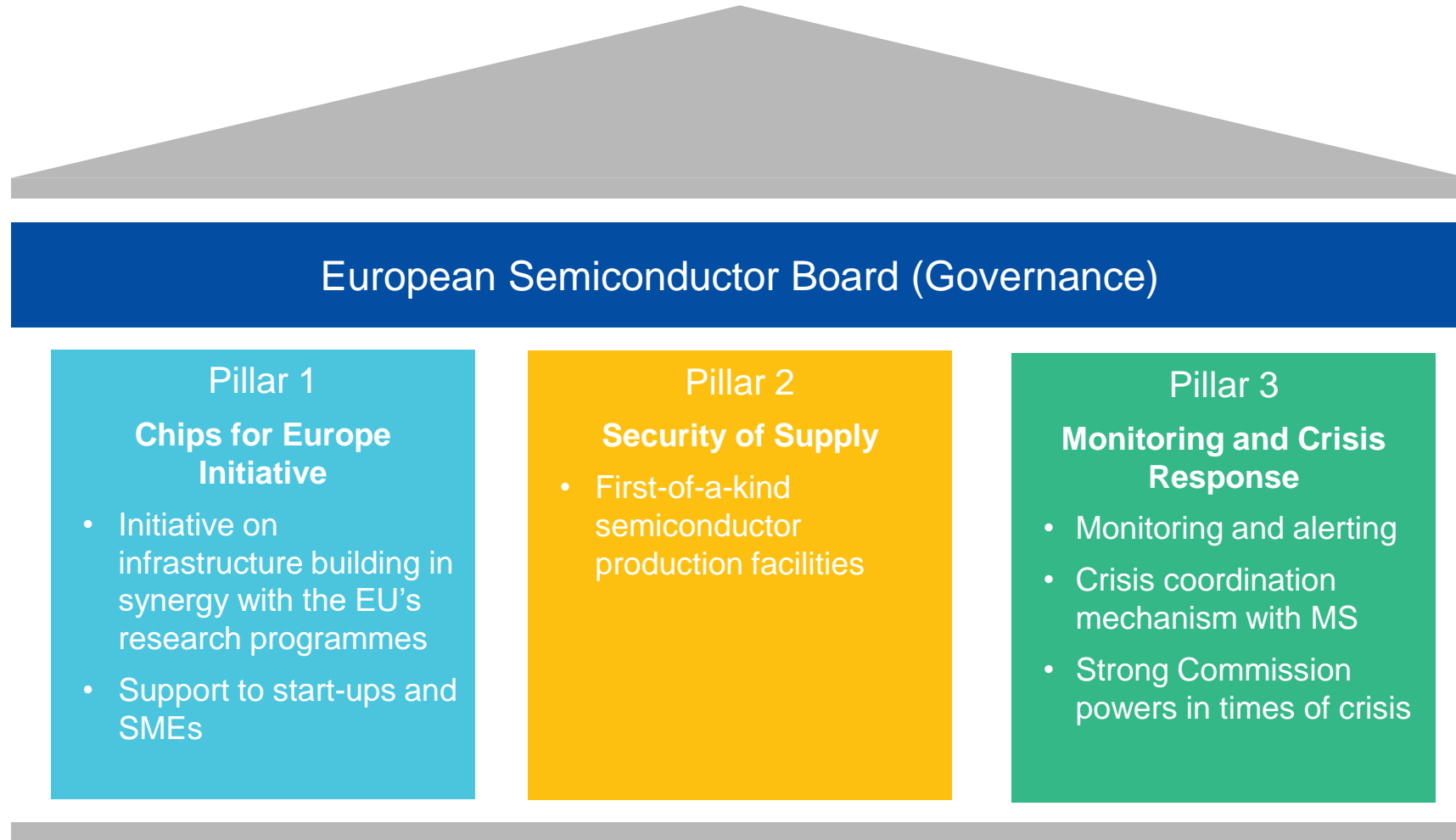
- Policy proposal made in speech on US-China relations
- Research group overseen by China's economic planning agency



Chips investments

- Europe
 - The overall level of policy-driven investment (Public investment and leveraged equity support) in support of the EU Chips Act is estimated to be in excess of EUR 43 billion up to 2030
- United States
 - USD 52 billion federal investments for R&D and semiconductor manufacturing, of which USD ~15 billion in R&I initiatives
 - USD 24 billion tax credits
 - Additional investments by individual States
- China
 - USD 150 billion over 10 years for semiconductor sector, additional USD 40 billion from regions
- South Korea
 - Tax incentives to support USD 450 billion private investments in R&D and manufacturing until 2030
- Japan
 - New program since 2022 with investments so far of USD 5+ billion

Three pillars of the Chips Act



Chips for Europe Initiative Objectives

From lab to fab

Create *large innovation capacity and a resilient and dynamic semiconductor ecosystem*

1. Build up **large-scale design capacities** for integrated semiconductor technologies
2. Enhance existing and develop new **pilot lines**
3. Build advanced technology and engineering capacities for accelerating the development of **quantum chips**
4. Create a network of **competence centres** across Europe
5. Establish a **Chips Fund** to facilitate access to loans and equity by start-ups, scale-ups and SMEs and other companies in the semiconductor value chains



Basic
Research

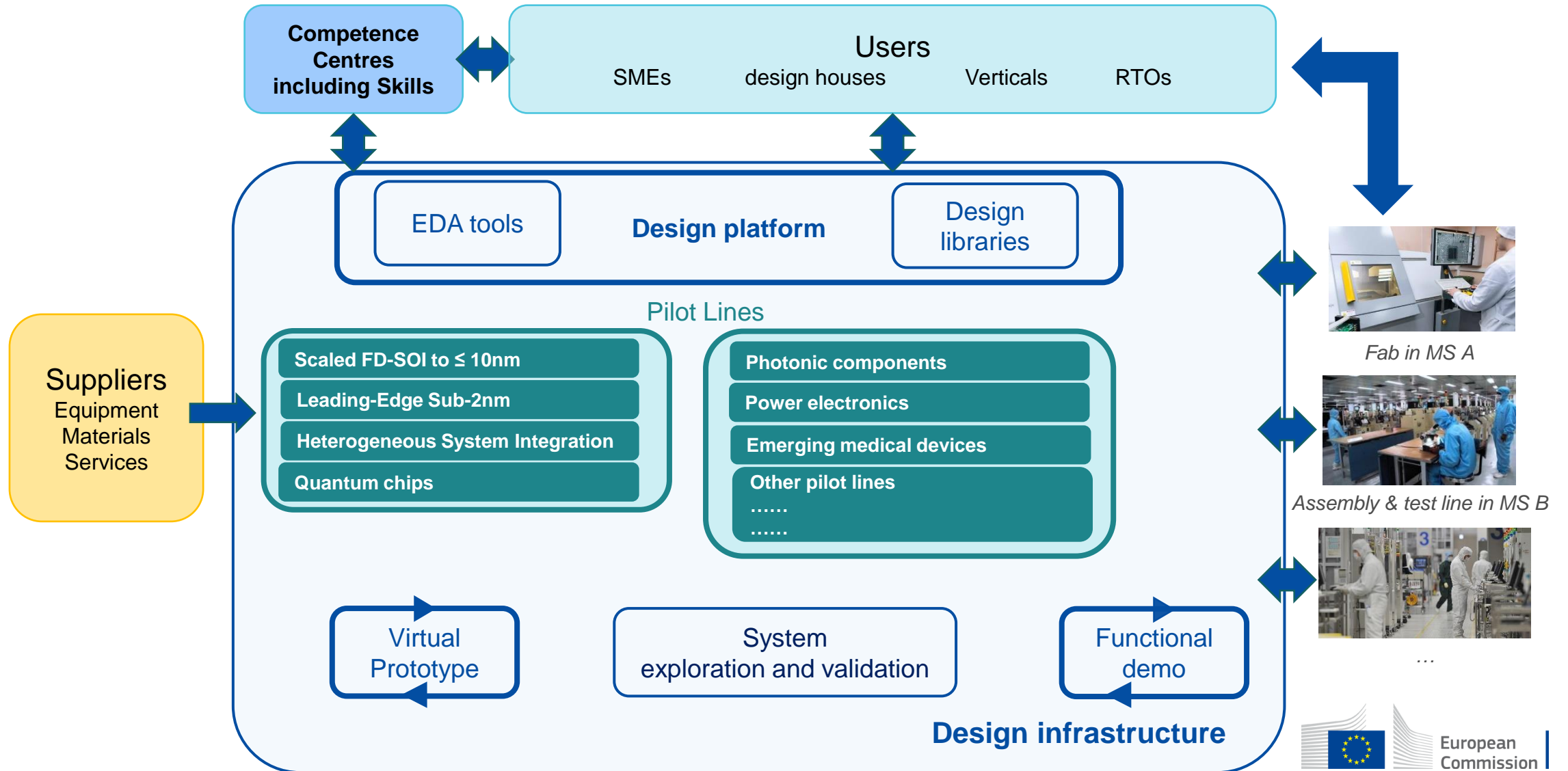
Applied
Research

Pilot lines

Prototyping

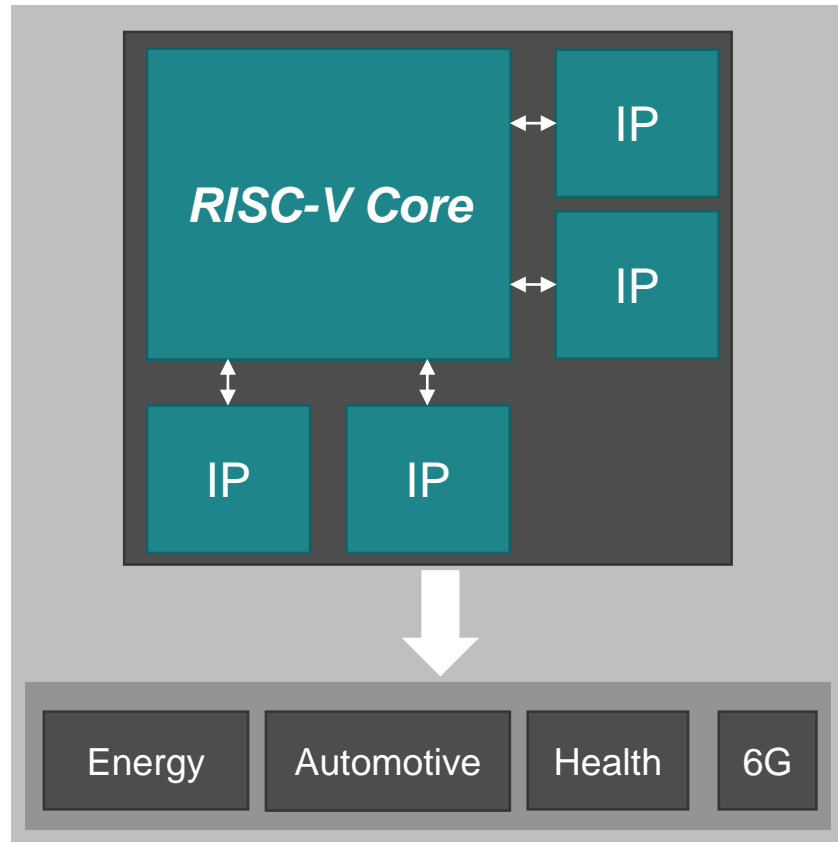
Production

From the lab to the fab



Examples of projects foreseen

Support for Open-Source HW / RISC-V



- Three-pronged approach to supporting RISC-V and open-source hardware:
 - Support for development of RISC-V mid- to high-end cores
 - Support for surrounding IP ecosystem to enable SoC design
 - Support for verticalization and adoption of RISC-V in European industry
- Open-source hardware is key to ensure sovereignty of European industry

<https://digital-strategy.ec.europa.eu/en/library/recommendations-and-roadmap-european-sovereignty-open-source-hardware-software-and-risc-v>

Complementing HW by SW Investments

**To allow industry to capitalise on Hardware Investment,
Investments in Software and Systems Platforms are a must**

- Examples:
 - Car Operating System – Software-defined Vehicle Platforms
 - Operational platforms for integration of renewable energy supply with key demand: EV-charging, smart building
- The KDT/Chips JU is supporting both HW and SW/systems innovation towards Europe's strategic autonomy

The future of automotive

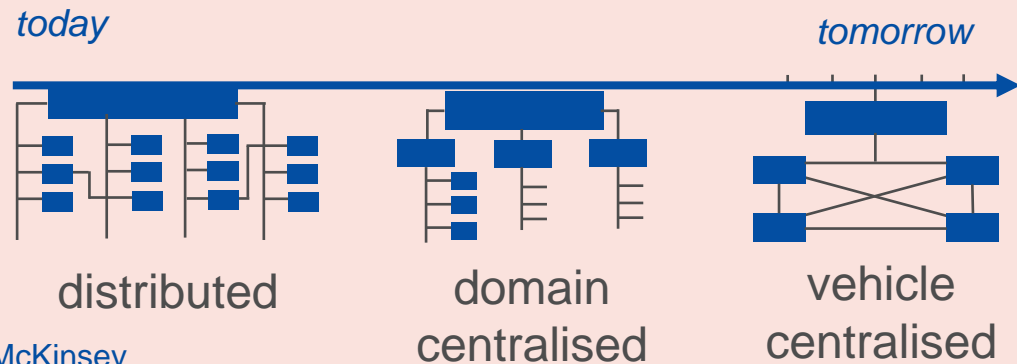
Mobility is increasingly:



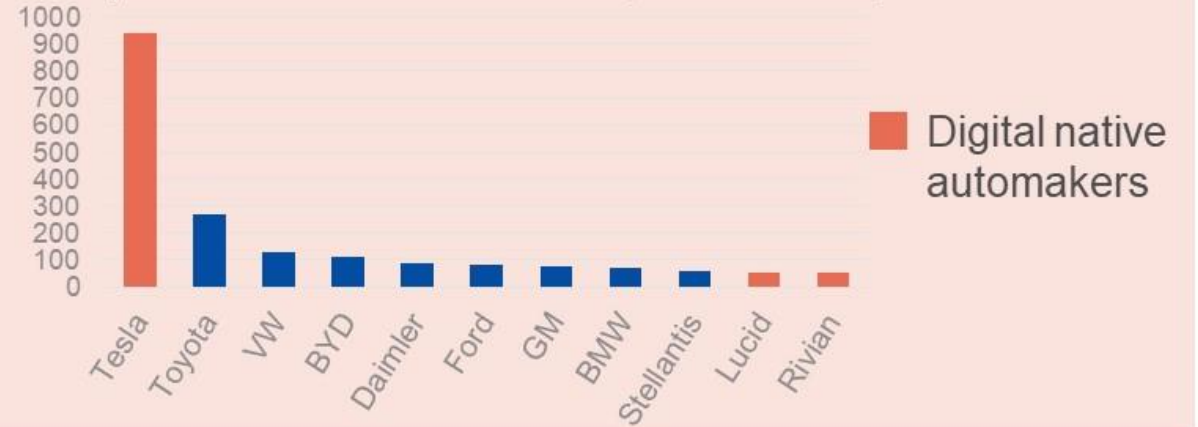
Share of electronics in total cost of a car



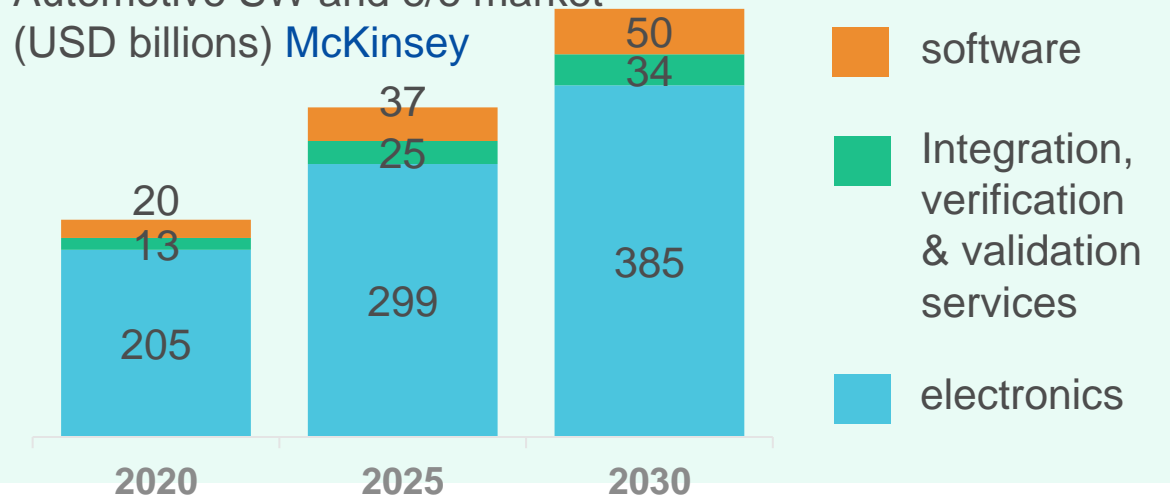
Evolution of e/e architecture



Largest automakers by market capitalisation in 01/22 (billion USD)



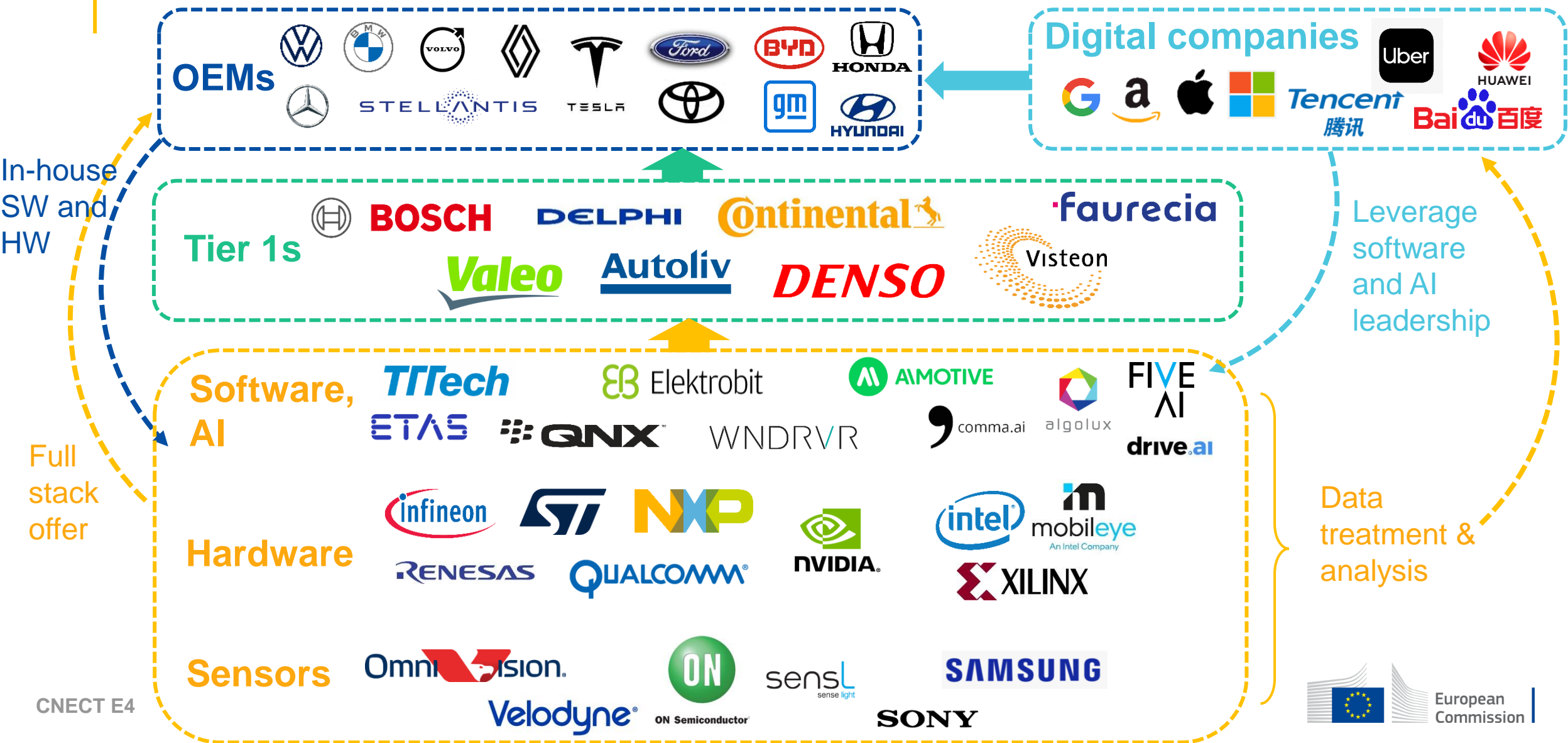
Automotive SW and e/e market (USD billions) McKinsey



Lines of SW code in a car



A disruption of the automotive ecosystem?



Car Operating Systems: A risk that the EU falls behind



Success of digital native automakers

Pioneers in 'software-defined vehicles' designed around central computer unit and single OS - « 6 to 7 years advance » of Tesla (Forbes)



Big Tech attacking the competition

Leading on certain segments (e.g. infotainment, autonomous driving)

Some OEMs cooperating (Volvo, Stellantis, Renault with Android Automotive)

Chinese companies strongly engaging



Threat to the competence and sovereignty of the EU automotive industry, with non-EU companies dictating future developments and business models

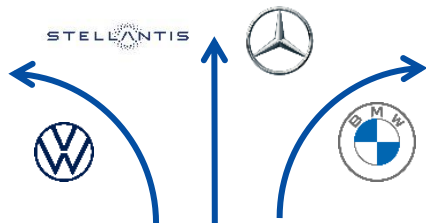
Fragmented efforts by OEMs and suppliers

Risky counter-attacks of some OEMs

VW, Stellantis, Mercedes, BMW investing billions in proprietary OS

Lack of resources, shortage of skills, uncertain viability

Patchwork approach limiting flexibility



Suppliers trying to stay in the race

Role as key suppliers of software is at risk

Want to offer software platforms working across brands and models (Bosch, TTTech, Elektrobit*, ETAS)

*Continental subsidiary



Growing interest for cooperation

Existing alliances: AUTOSAR, COVESA

Bilateral cooperation: Bosch + VW, Renault + Continental, ...

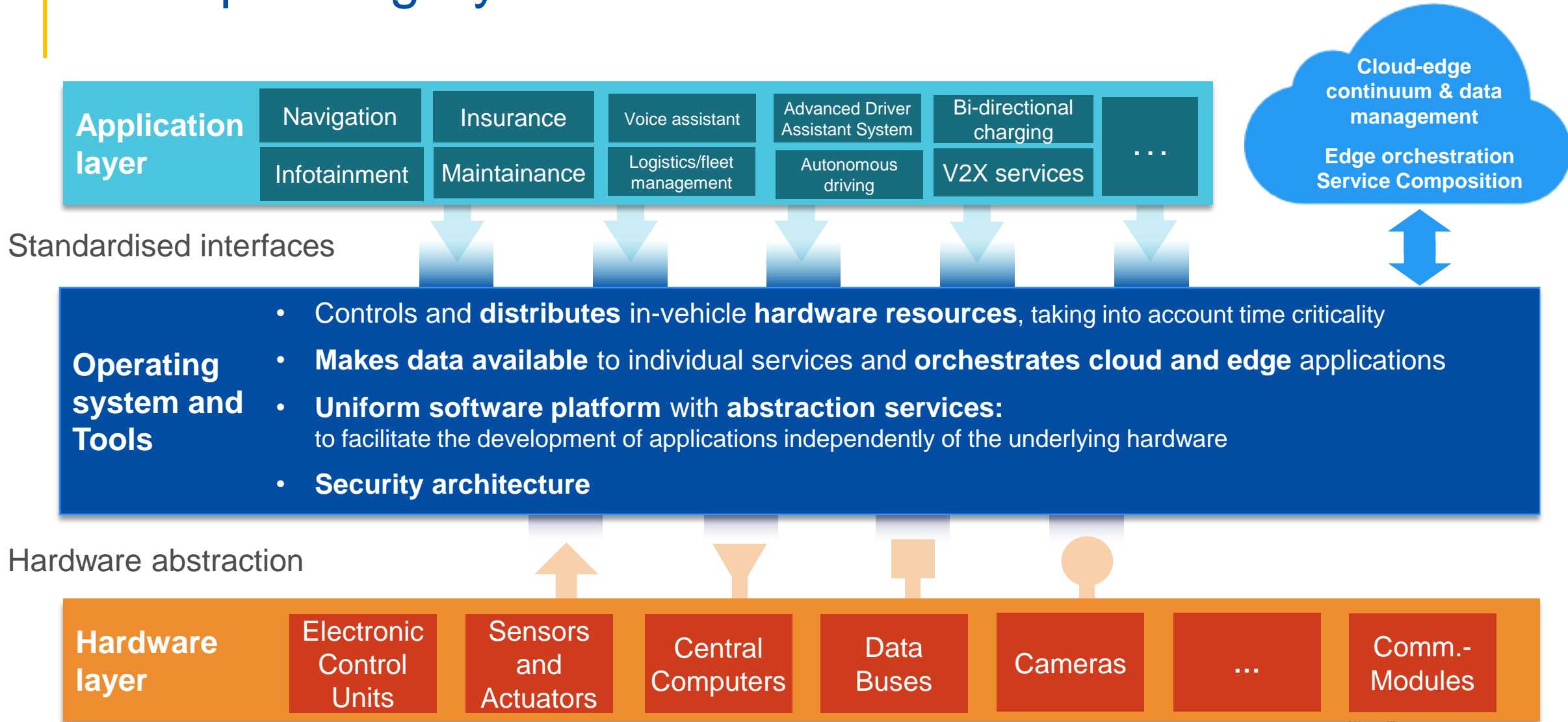
Partnerships with NVIDIA, Qualcomm, Intel, QNX, Google ...

ECLIPSE WP SW-def. vehicle

Interest in broader collaboration



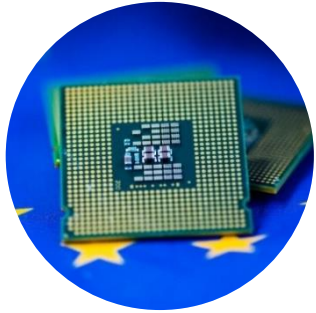
The role of a SW-defined Vehicle platform: Car Operating System and Middleware



Automotive sector: Bridging the gap between EU strategies

Open Car OS Platform:

A federated open car architecture for digital autonomy in the automotive sector



Chips Act

Next generation chips powering intelligence at the edge: European automotive processor

Link Semiconductor value chain and SW leadership



Link to the European mobility data and cloud infrastructure



Data Strategy

Data Act: Access and fairness on car data market, leading to revision of type approval for **in-vehicle data**

EU Mobility Data Space

EU 5G & cloud-edge infrastructure/services

Digital Market Act: limited role of gatekeepers

Platform / marketplace for automotive, HW and SW products and services



New Industrial Strategy

Transition pathways:
For a resilient, innovative, sustainable and digital mobility ecosystem



Open, dynamic ecosystems for EU tech businesses, e.g. **Tier-x suppliers**

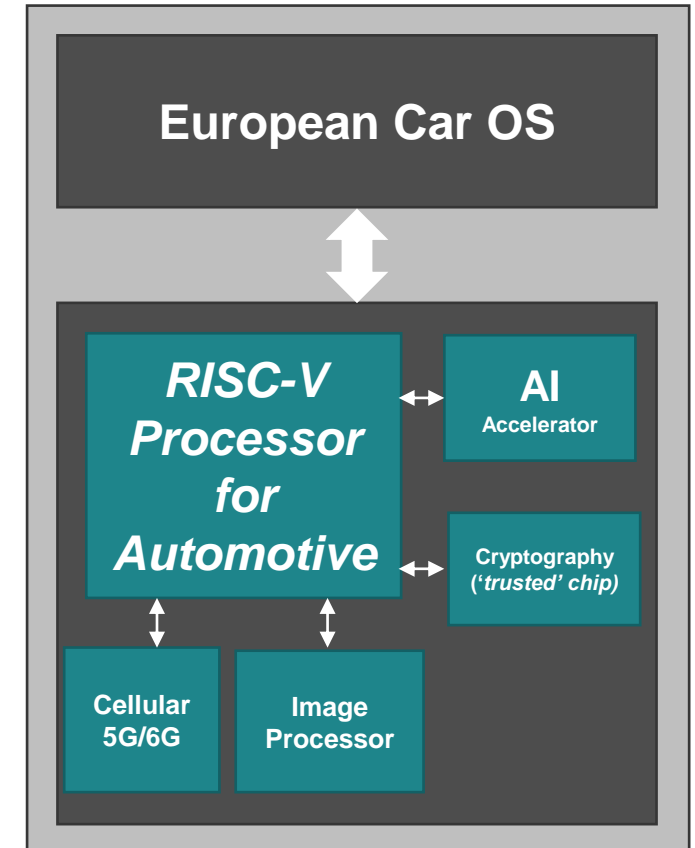
Examples of projects foreseen

Possible support for Car of the Future

Towards electric, autonomous, connected and shared vehicles

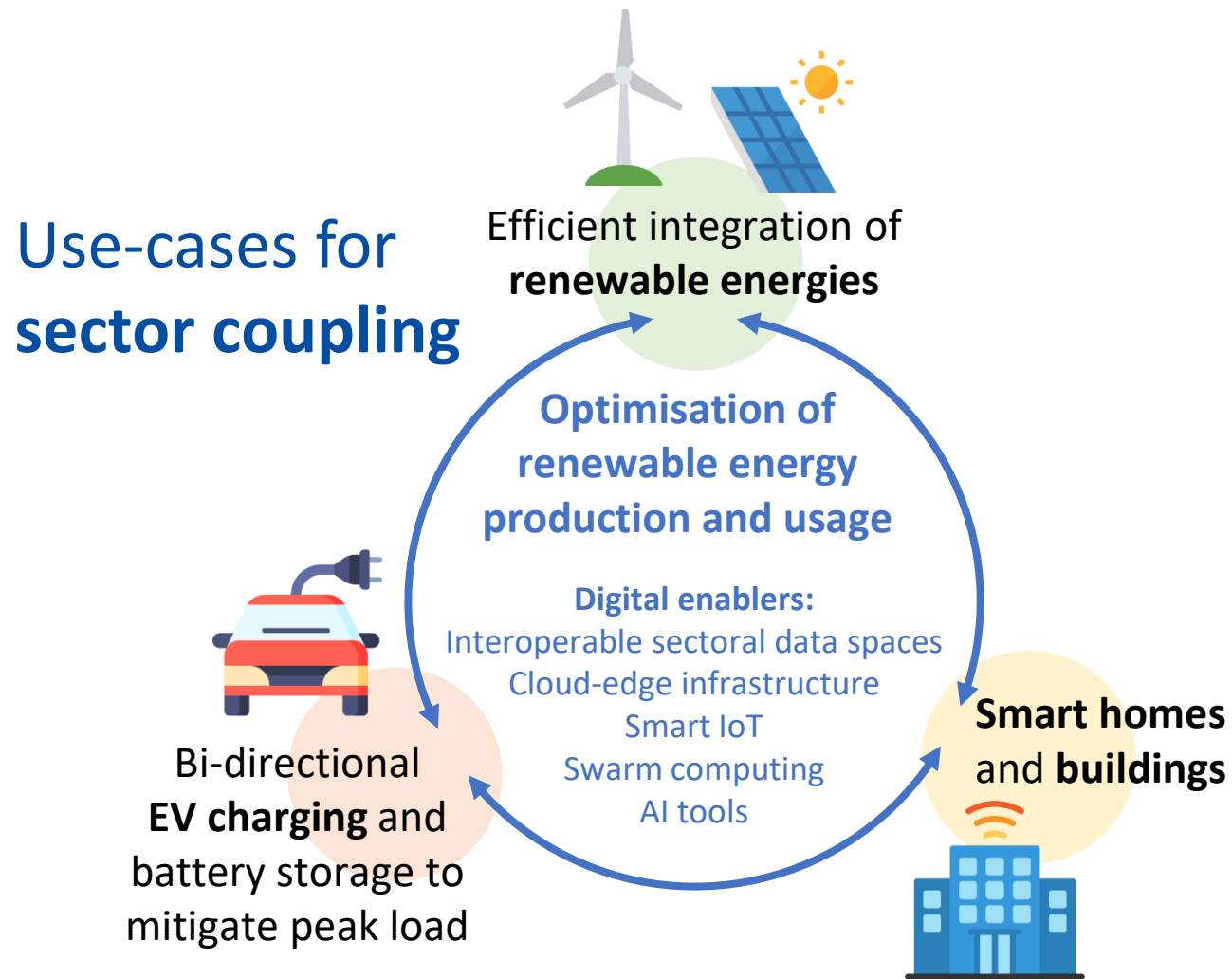
EU-driven open SW-defined vehicle platform: Car Operating System and Middleware

- **Open collaboration**, driven by EU players, but open to broader participation
- Collaboration on **non-differentiating features** e.g. open reference architecture, open standardised interfaces, common developments models including tool chains, reference implementations and ecosystem building
- **Targeted efforts** building on European strengths and most crucial components
- **Agile approach** allowing rapid prototyping, validation, testing and commercialisation



Key use case in the energy sector:

Local optimization of renewable energy production versus consumption by smart homes/buildings and EV-charging



Key need:

A system of systems approach:
Open operational platforms
for infrastructure integration

Thank you



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