

# Sustainable mobility by seamless digitalization



Autonomous Conference, Vienna  
29.09.2021 14:15-16:15

***TTTech***

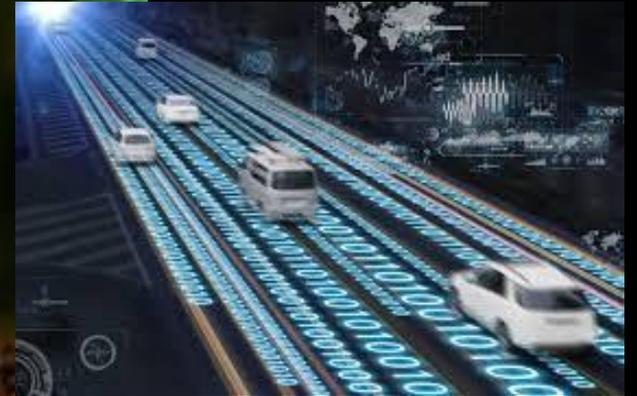


Input from Europe's Funded Electromobility research projects  
Today's contradictions

Reiner John, AVL List, Austria  
et. all

# Emergence: the solution comes from system

The collaborative  
individuum knew's  
nothing about the bridge



internet



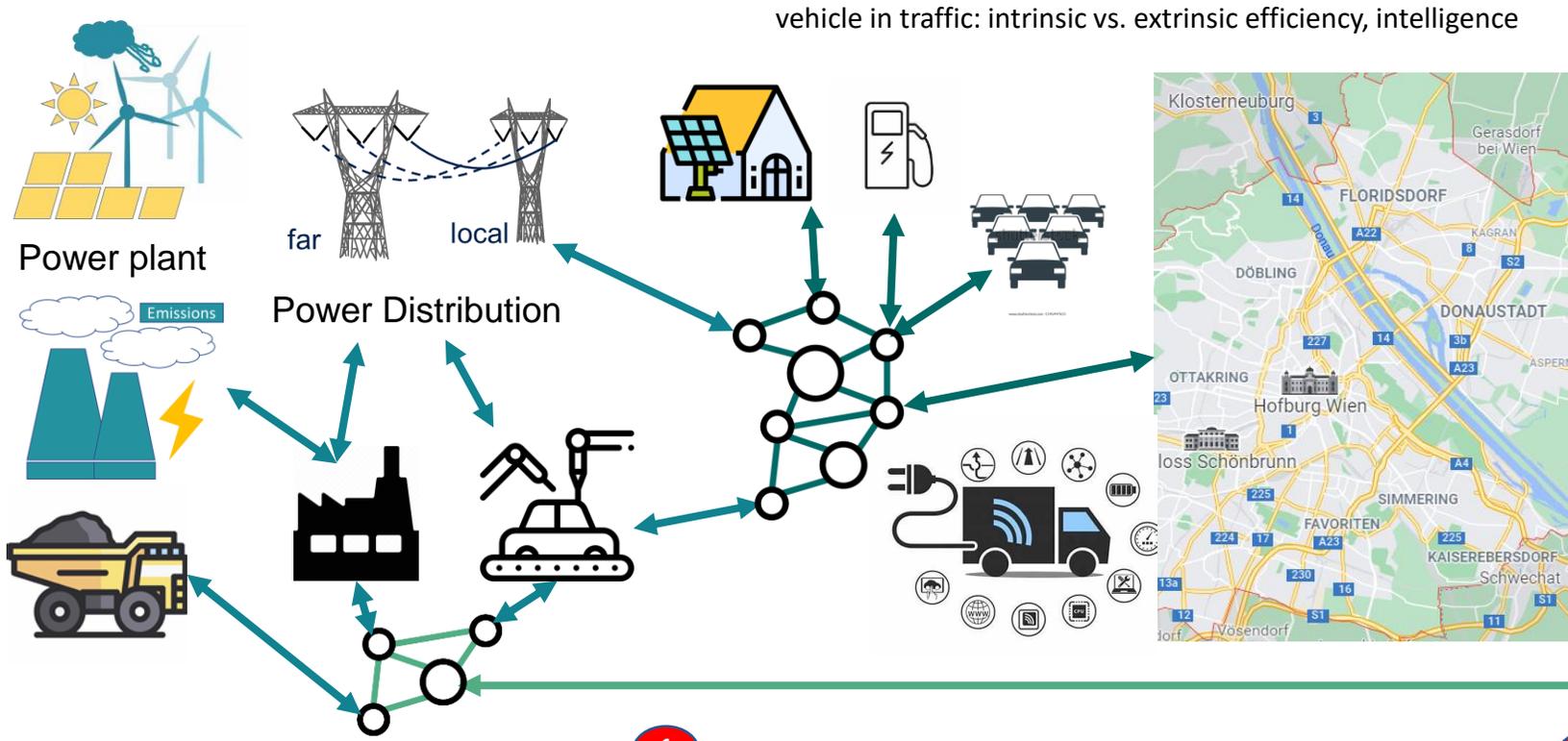
internet



internet

Trustfully Collaboration in complex, complicated and chaotic systems

# Sustainable Mobility and climate neutral economy by emergence



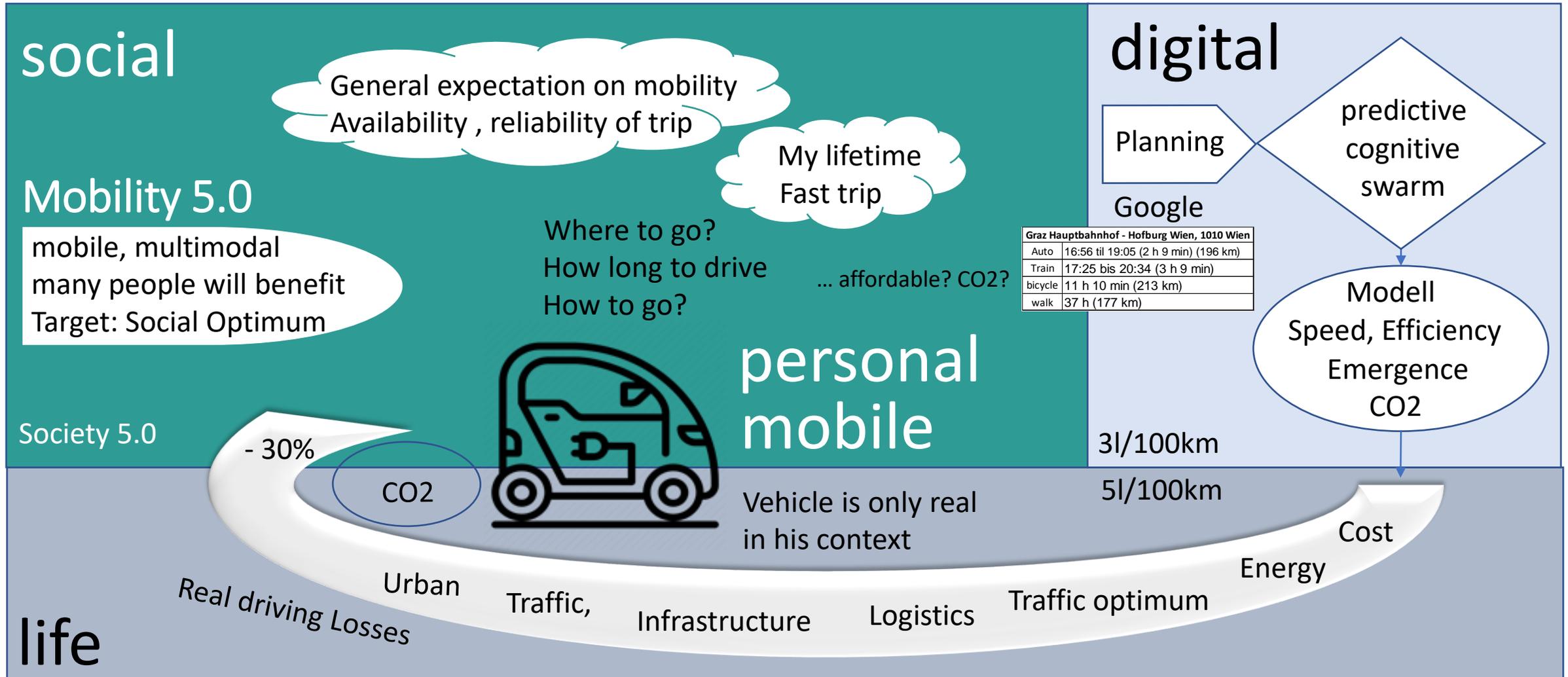
**1** ECO Design, Carbon dept visibility, environment impact, supply chain resources, Efficiency, Material substitution, reduce yield losses

**2** Product as a service, advisory service, Integration and simulation of energy grid, traffic with real time energy prediction, maximize lifetime, predictive maintenance

**3** Design for recycling, Re-Use Separability and 2nd life or Re-attribute, product disassembly

Driving, connected assets, digital twin

The individual human will choose his way of mobility, technology will minimize emissions, optimized by extrinsic intelligence and efficiency from electric, connected, automated and shared mobility



# The ECO system of European funded projects

ECO Design, Efficiency, Material substitution, reduce yield losses

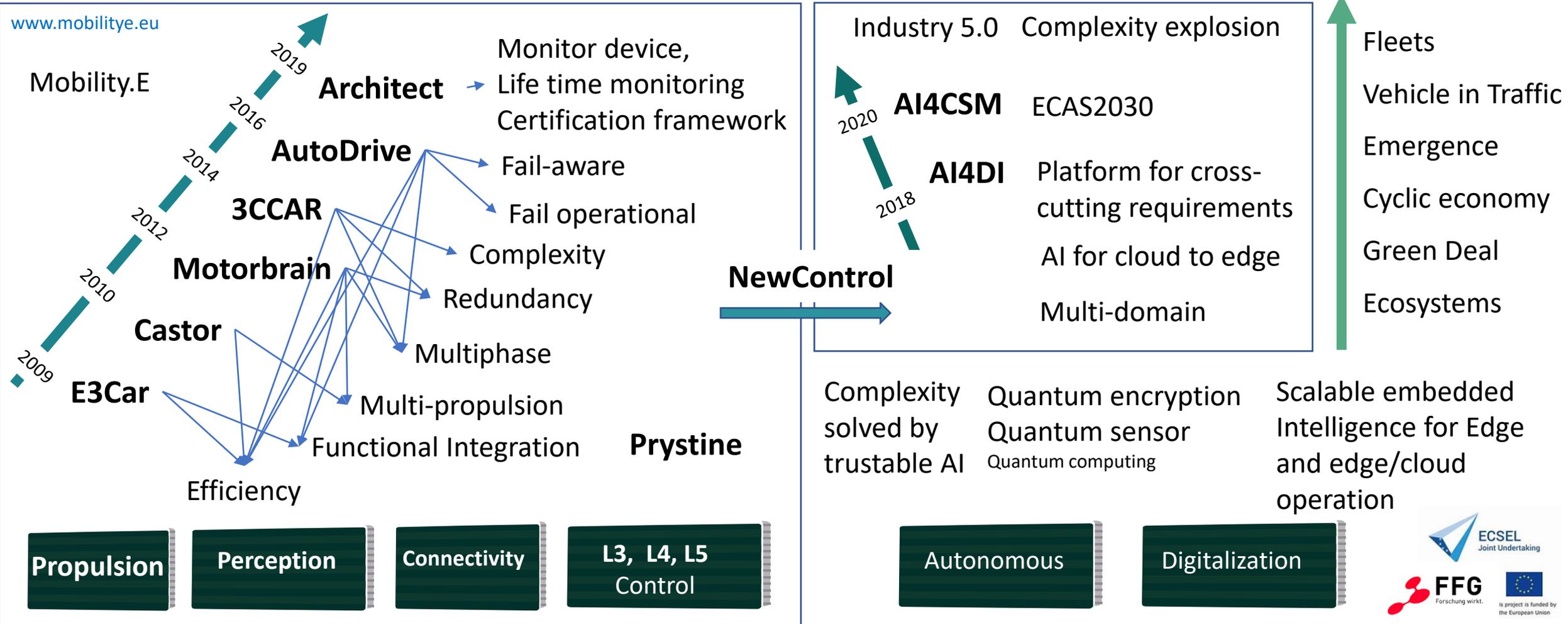
Carbon dept visibility, environment impact bill, supply chain resources,

components and data for cyclic economy

ECAS2030

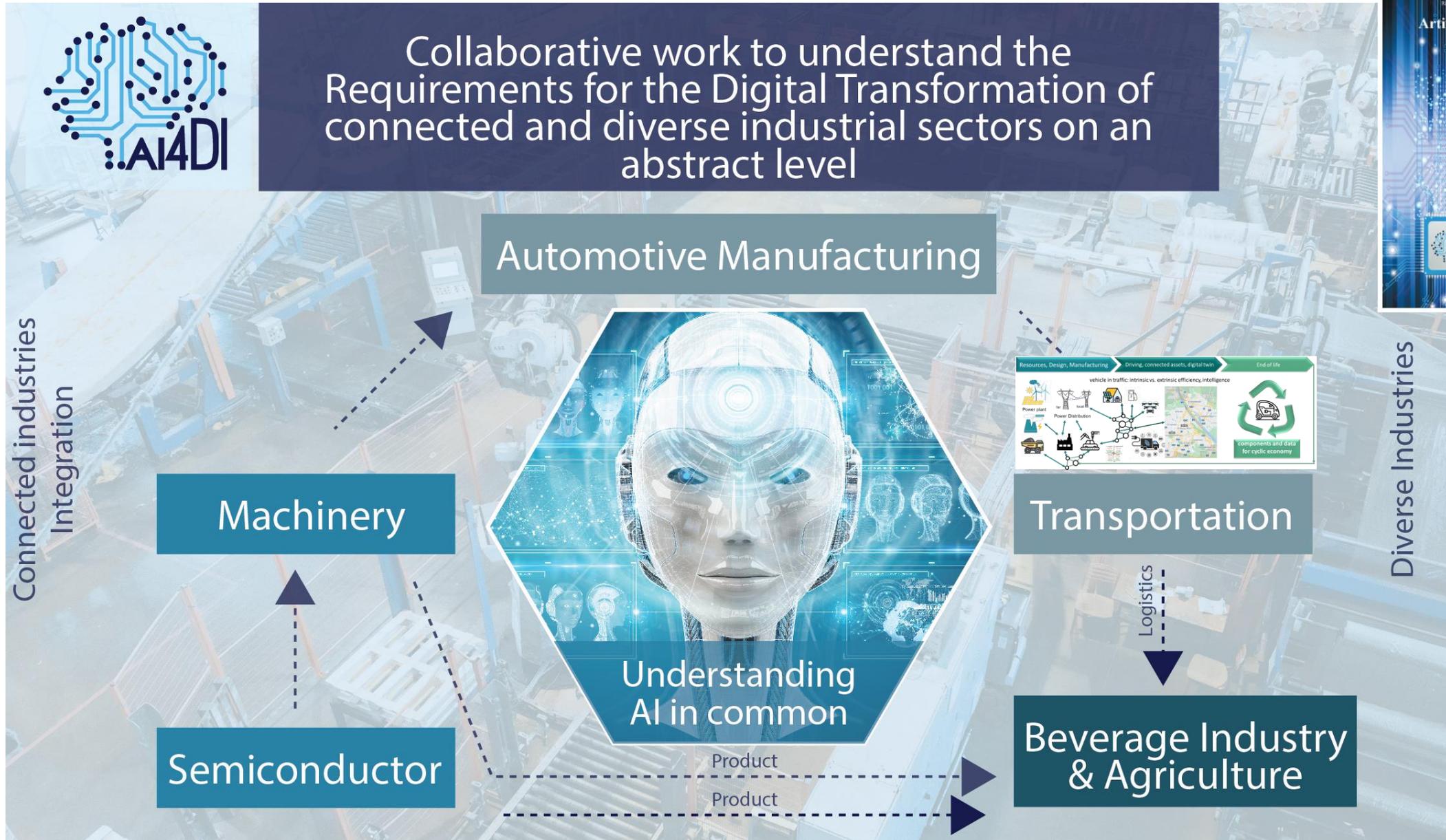
Society 5.0

Sustainability,



# AI4DI artificial intelligence for the digitizing industry

AI4DI Book for download  
<https://we.tl/t-6ZDubJZIfn>



Build and sustain dynamic AI technology ecosystems in Europe, ensuring ethical, responsible, and trusted AI for safety-critical real-time applications.



Driving, connected assets, digital twin

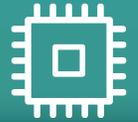


## Integrated, Fail-Operational, Cognitive Perception, Planning and Control Systems for Highly Automated Vehicles

Holistic virtualized platforms enabling mobility as a service



Increase the accuracy and robustness of algorithms, E/E architectures for adaptive perception



Increase performance, power, reliability, and reduce cost of the on-board computing platforms used for perception, cognition and control



Achieve certifiability of adaptive algorithms for safety-critical control functions



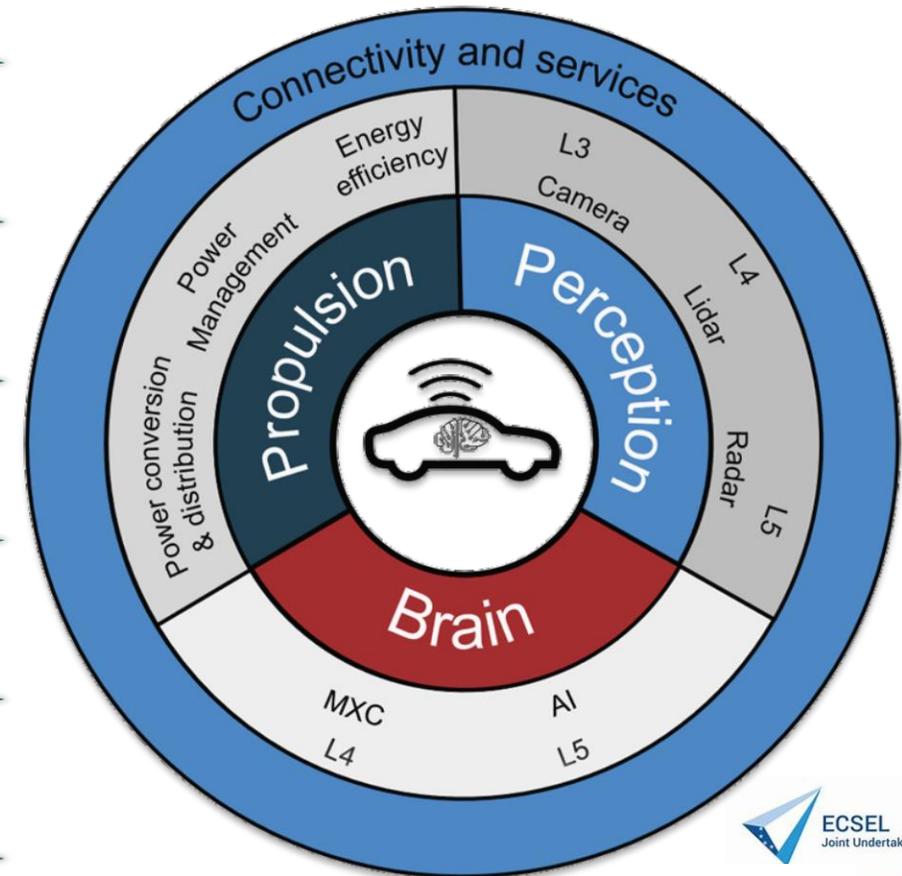
Develop a generalized hardware abstraction layer for efficient, adaptive fail-operational control of propulsion systems across vehicular platforms



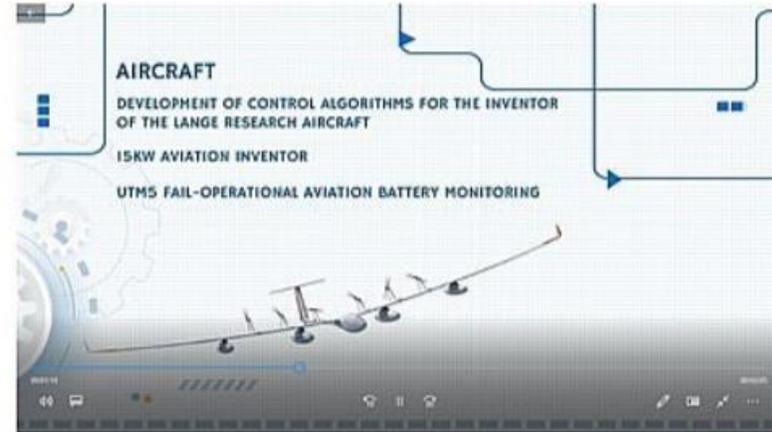
Competitive edge to European industry



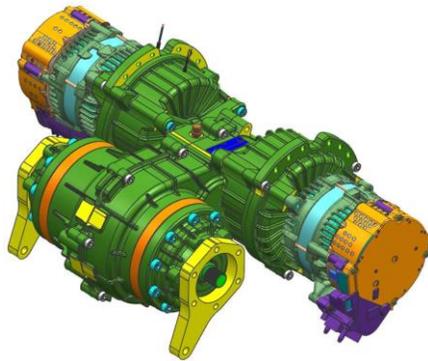
Increase user acceptance of automated control functions



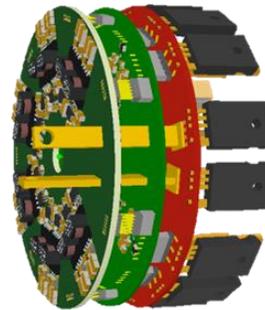
Bosch, Germany



SAE L5: fail operational propulsion system



Lange Aviation Germany

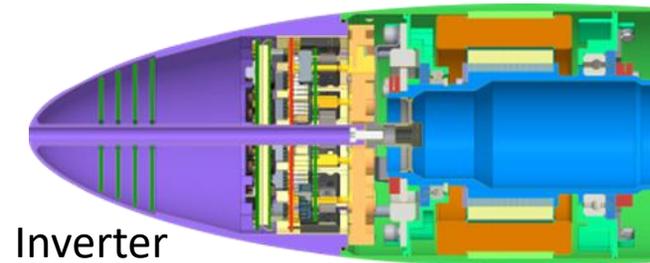


SAE L4: driving from harbor to city of Malaga Iriza, Technalia et. all AutoDrive – technologies to be safe



E-Axle: What's new?

fail-operational design by using clutches to be able to de-couple in case of mech. failures scalable design for faster lightweight robo taxis (1000 kg, 100 km/h) & more heavy shuttle pods (3000 kg, 30 km/h)



Inverter & Battery Monitoring for Aerial Vehicle

<https://www.mobilitye.eu/projects/autodrive>

Driving



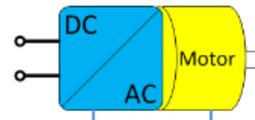
# EV Propulsion



## AutoDrive

Fail operational system, highest efficiency, lightweight, 2X 250KW

AutoDrive  
2017 - 2020



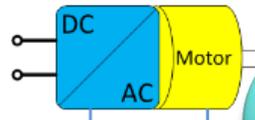
Cooling

3CCar  
2016 - 2019

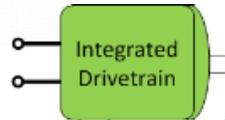


## 3CCar:

Power electronics fully integrated, 6-phase phase

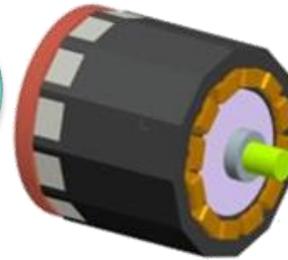


Cooling



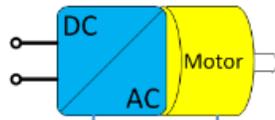
Cooling

Emile  
2013 - 2016



## Emile:

Fully integrated Power electronics, multiphase



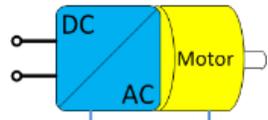
Cooling

MotorBrain  
2012 - 2014



## MotorBrain:

built-on, 9-phase



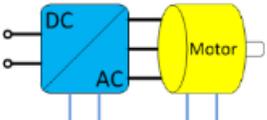
Cooling

Castor  
2011 - 2013



## Castor:

built-on, 6-phase first investigation



Cooling

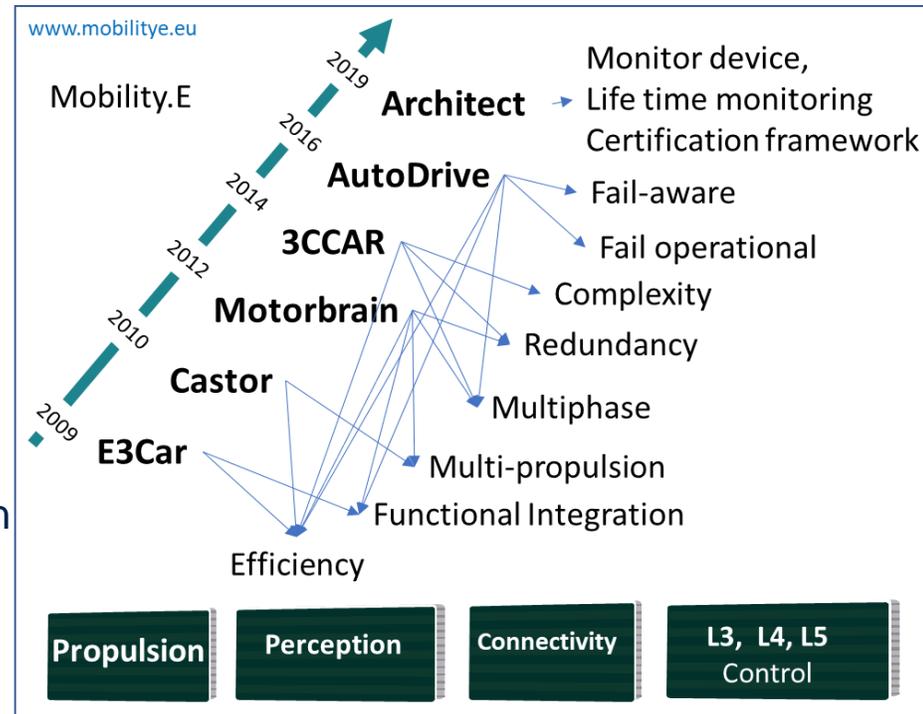
Cooling

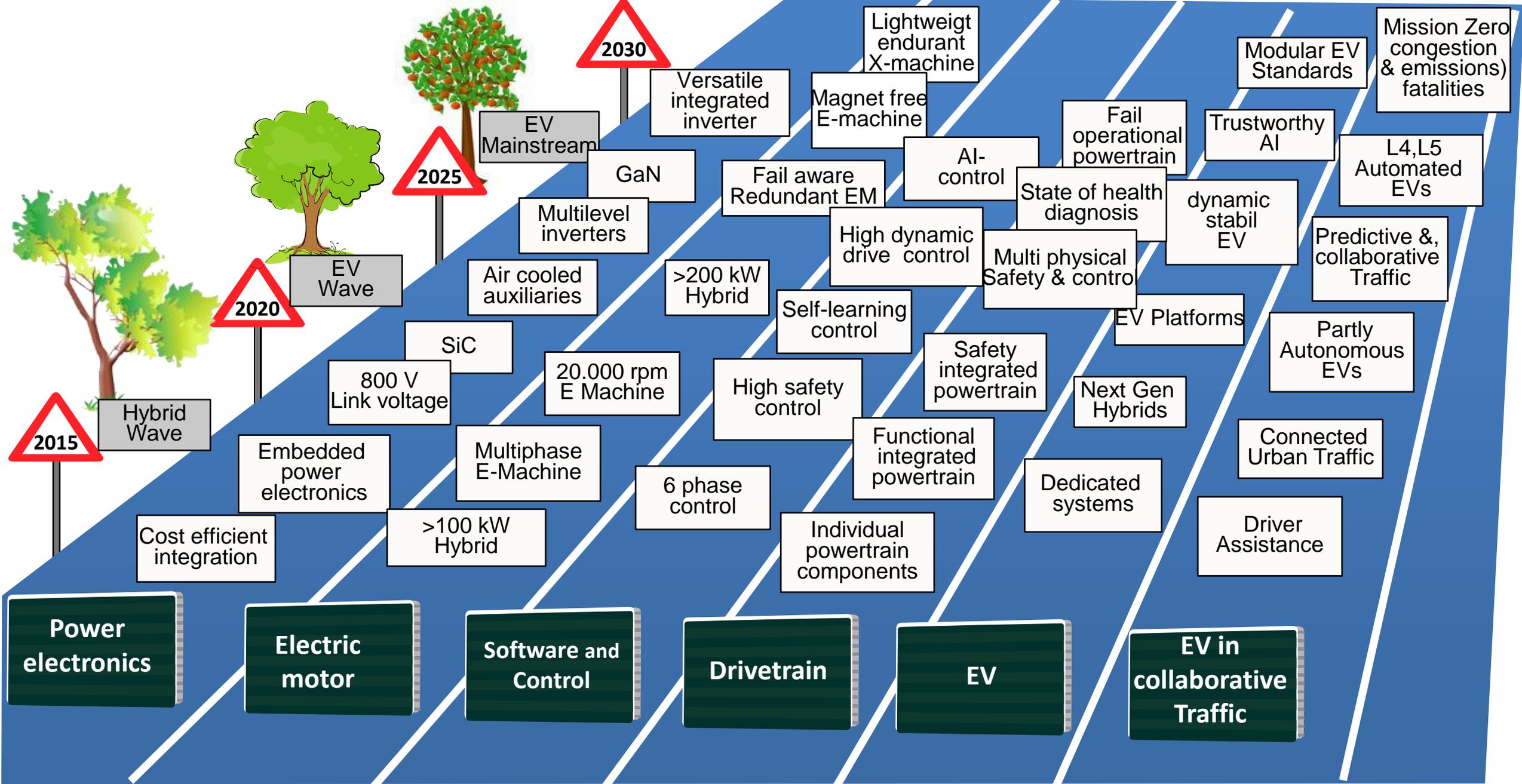
E3Car  
2009 - 2012



## E3Car:

separate, 3-phase





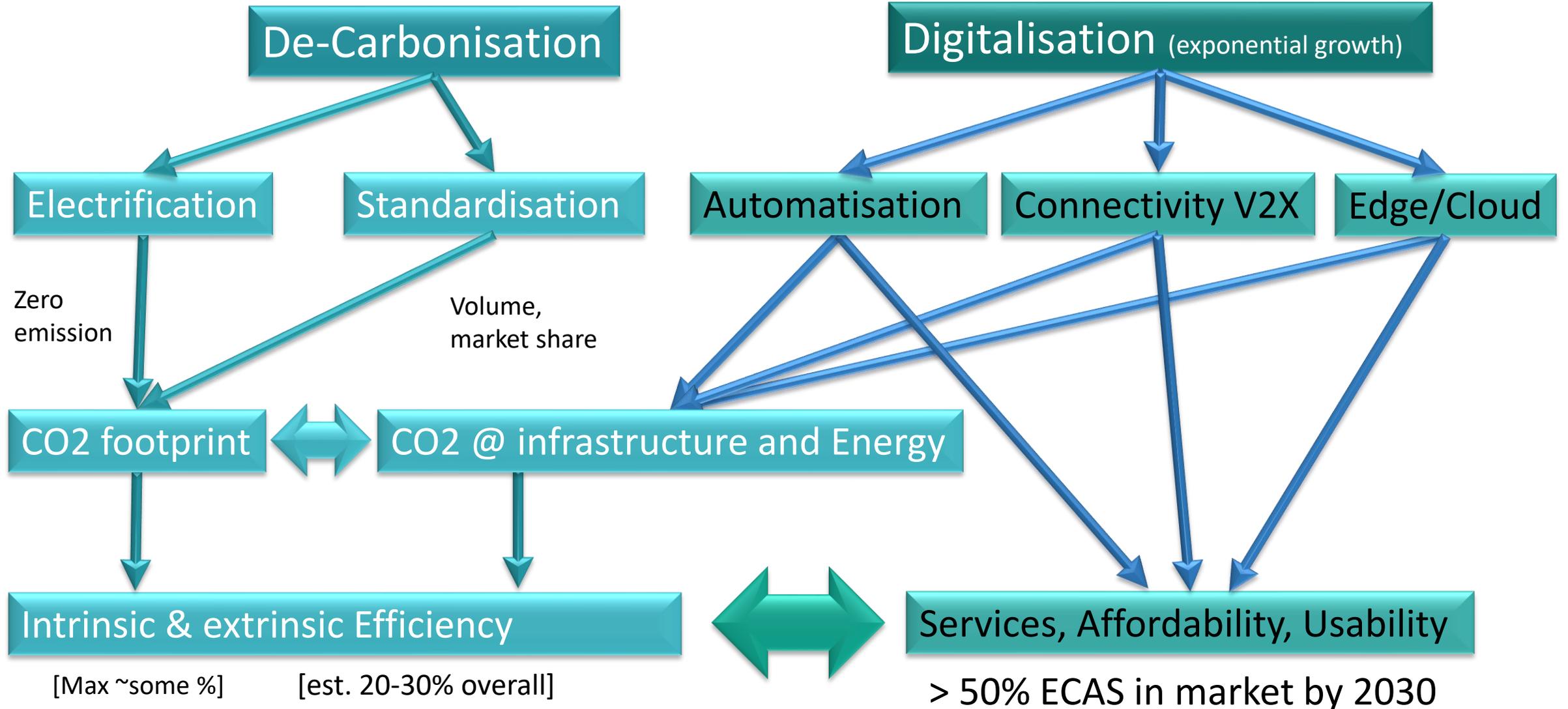
**Automomy** →

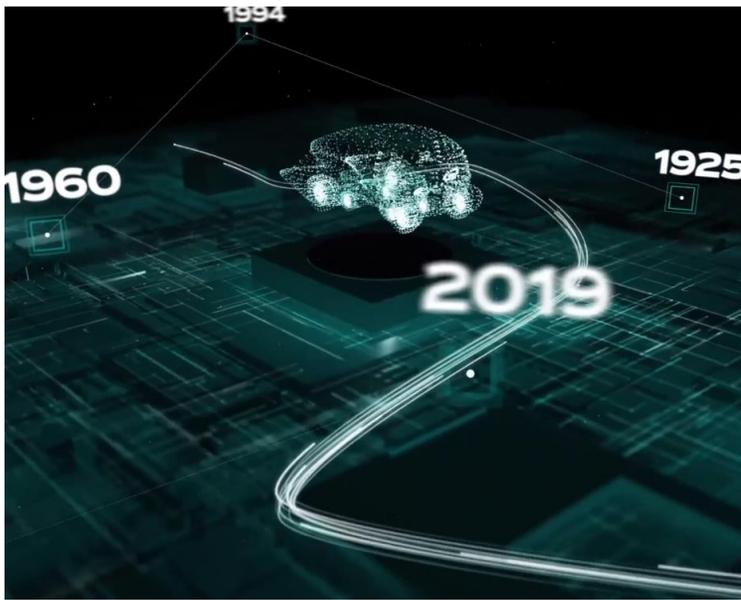
Resources, Design, Manufacturing

Driving, connected assets, digital twin

End of life

Semantic – Layer ECAS





Final page:  
 Thank you very much,  
 Many greetings to Vienna  
 Autonomous 2021

