48 V Systems for Future Mobility

More than CO_2 Reduction in 2025

A3PS
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Magna Powertrain
V0.2

MAGNA

AGENDA

Why 48 V?

48 V for CO_2 – Emission and Driving Functionalities

48 V for Autonomous Driving

Expected Penetration Rates of 48 V

Summary

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Why 48 V?

What is Driving 48 V?

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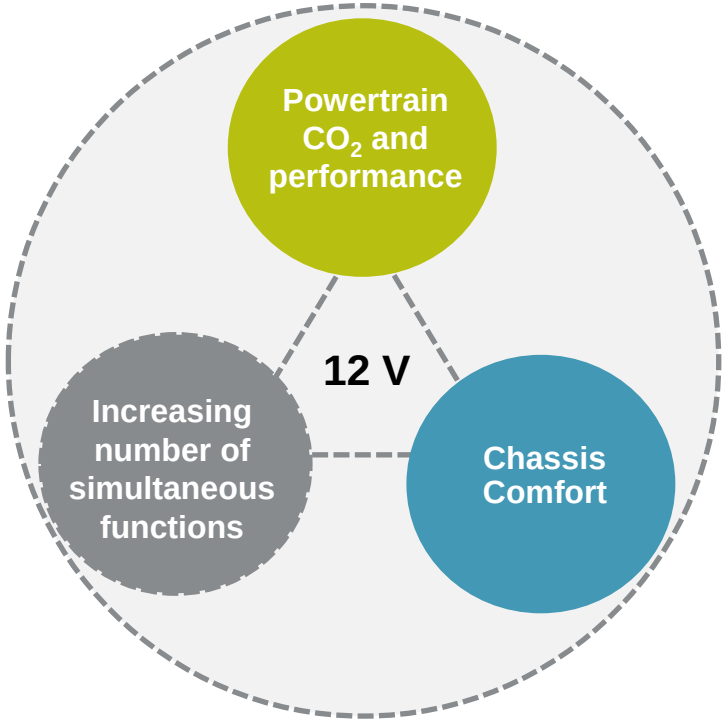
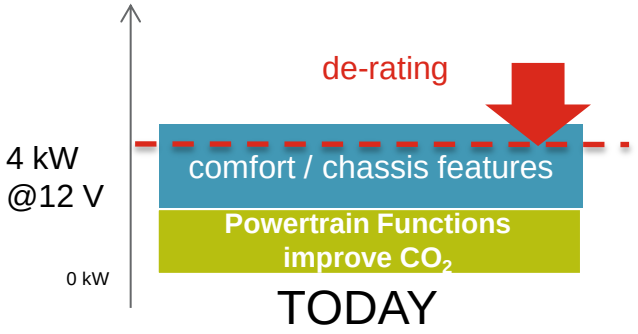
Global OEMs

End Consumers

Legislation

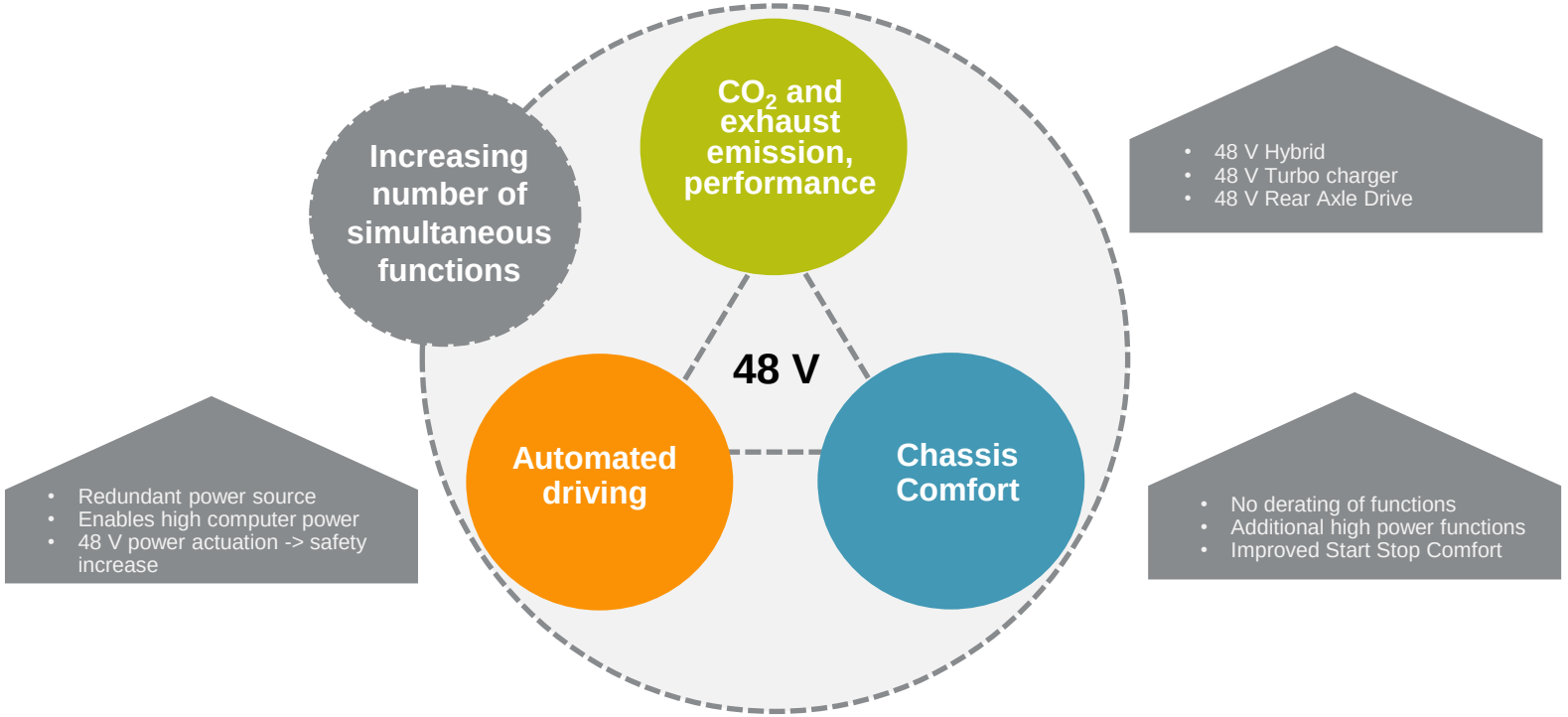
What is the 12 V Power Supply Capability?





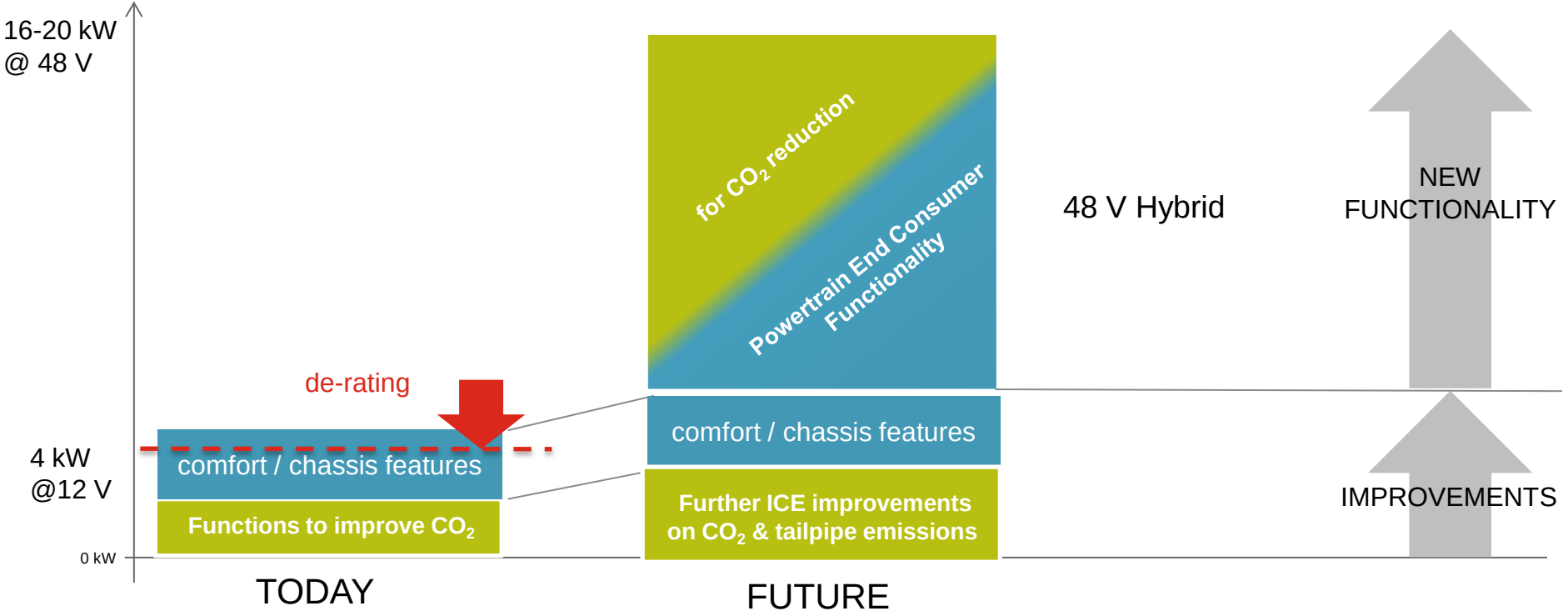
The Power Supply today is already on the limit

Which Functional Trends will Impact 48 V?



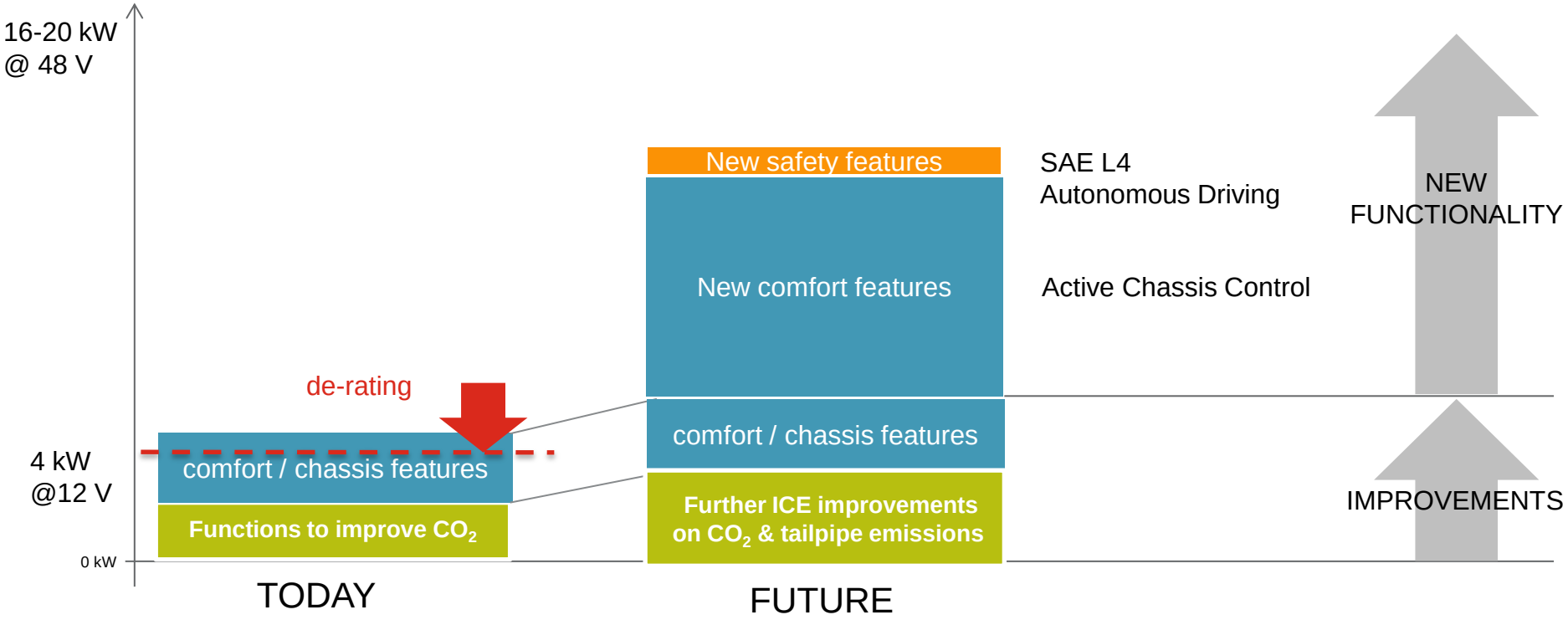
48 V enables much more than only CO_2 Reduction

48 V Hybrid Scenario



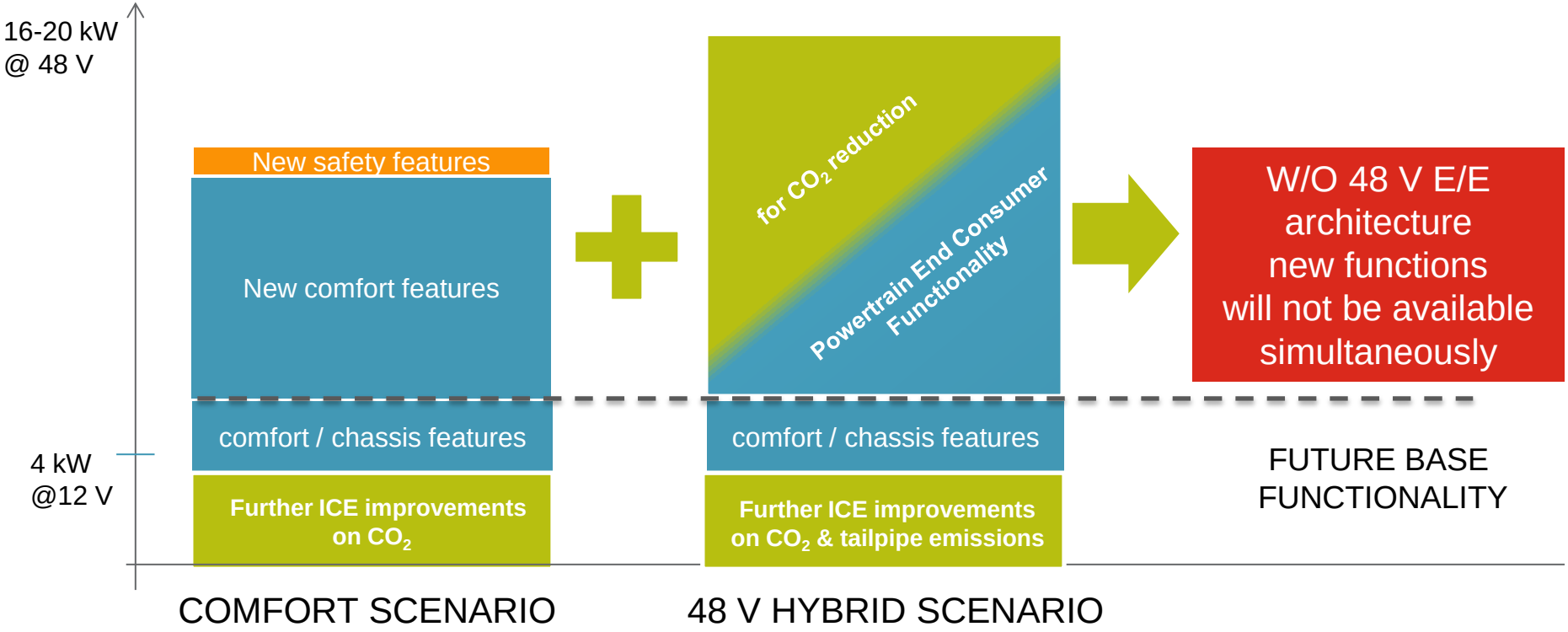
CO_2 reduction on ICE and 48 V Hybrid has a high power request

Comfort Scenario



Autonomous Driving and Active Chassis Control has a high power request

Simultaneous Functions in Future



Further Improvements of Power Efficiency of "ALL" Components required

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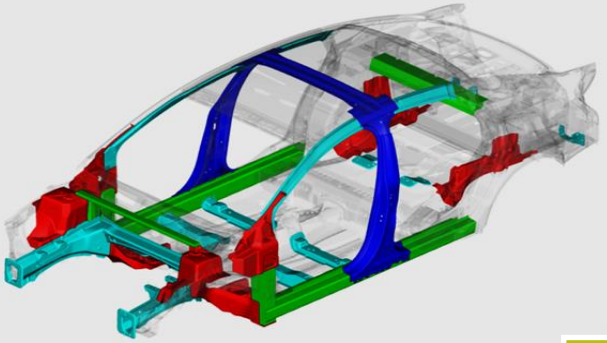
48 V for CO_2 – Emission and Driving Functionalities

What is the impact from Legislation to CO_2?

	2015	2025
Euro	130 g/km	est. 75 g/km
US	263 g/mi	163 g/mi

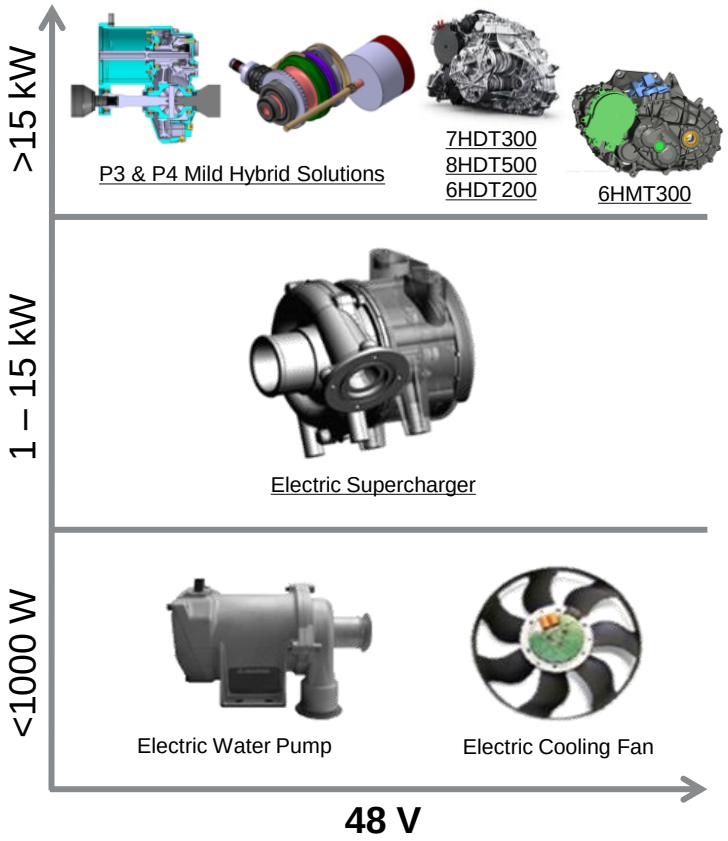


Small contribution from lightweighting aerodynamic rolling resistance

Powertrain electrification enables significant CO_2 reduction

Powertrain Electrification is needed to meet future CO_2 requirements and for driving in Low-Emission Zones

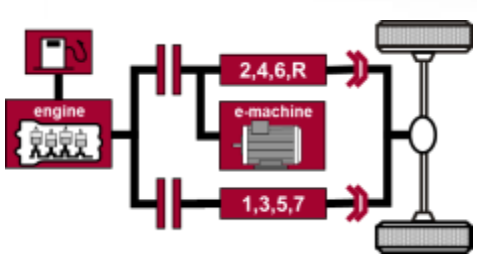
48 V for CO_2 – Emission and Driving Functionalities

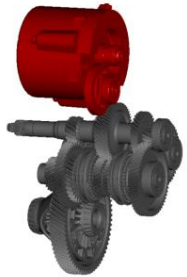


Scalable Products with **Common Technology Base** will enable:

- CO_2 reduction
- Driving Performance
- Electric Parking Maneuvering
- Electric All Wheel Drive

48 V for CO_2 – Emission and Driving Functionalities





Key Performances

- Significant fuel consumption reduction based on modular transmission kit
- Easy scalability from 48 V up to plug-In
- High modularity with base DCT transmission

48 V for CO_2 – Emission and Driving Functionalities

Key Performances

- Significant fuel consumption reduction
- Low µ assist
- Electric driven parking maneuvers

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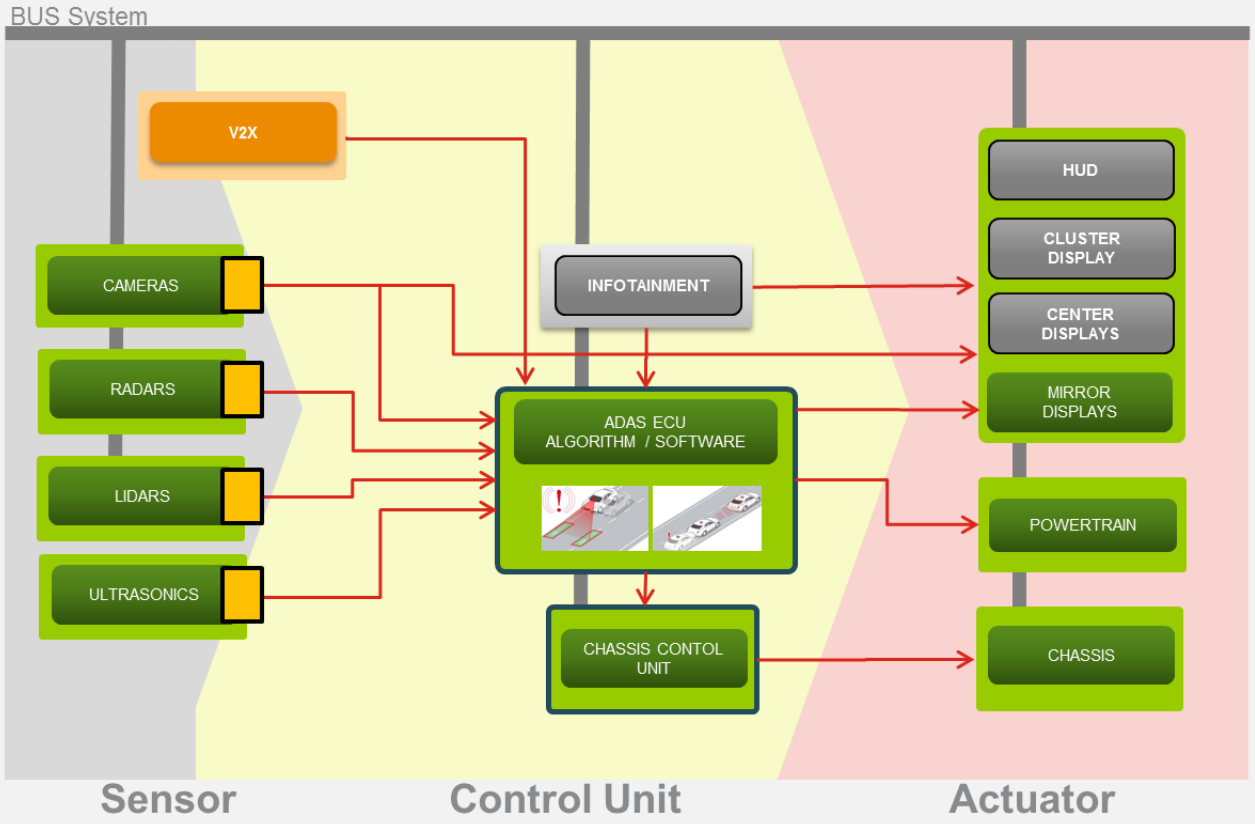
48 V for Autonomous Driving

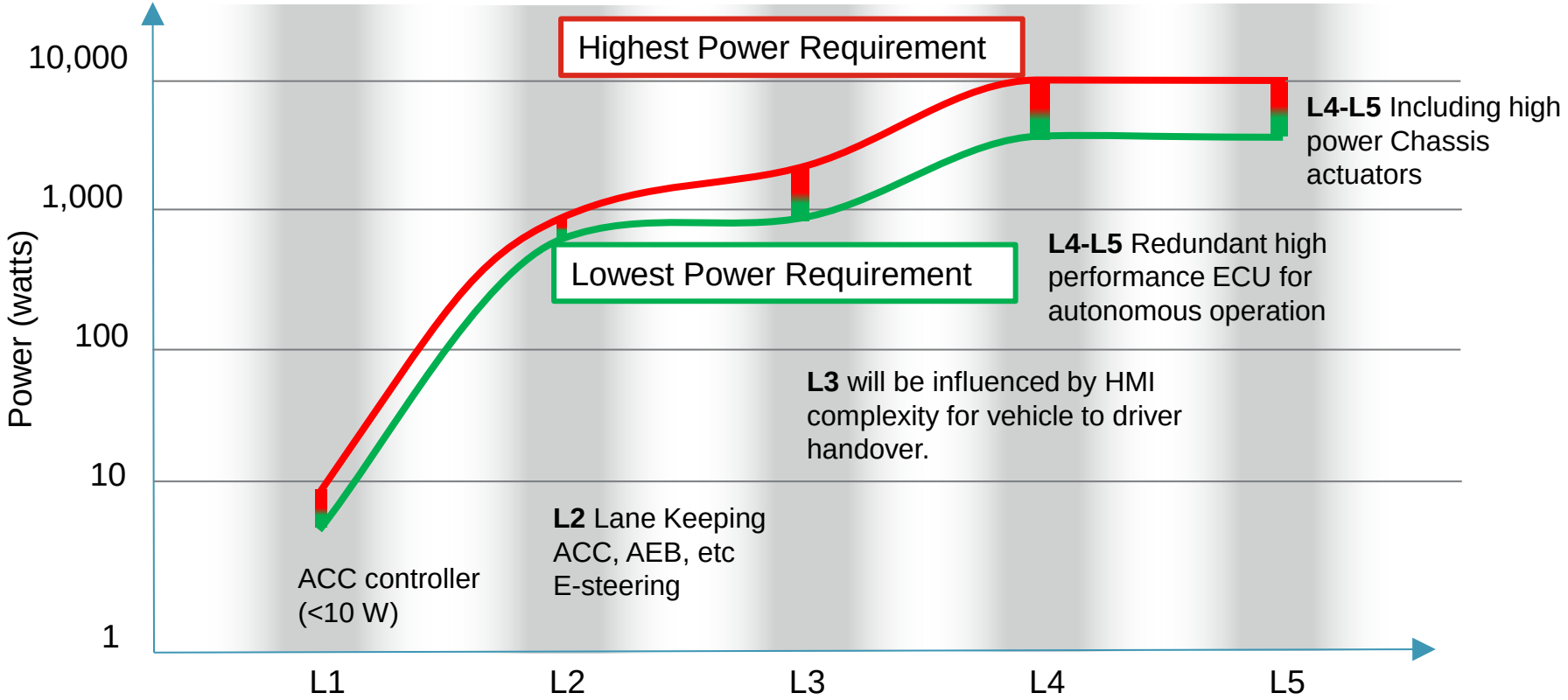
48 V for Autonomous Driving



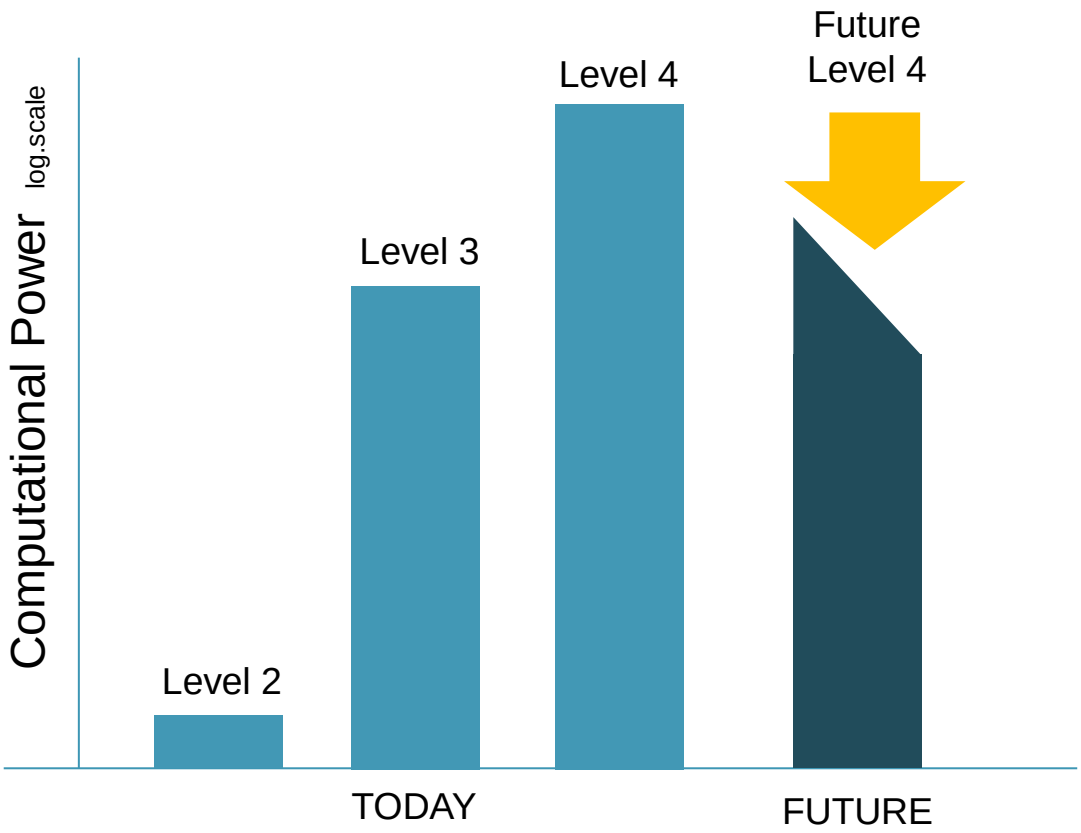
Scalable Product Platform

- Level 2 to Level 4 functionalities
- Redundant power source
- Enables high computer power
- 48 V power actuation

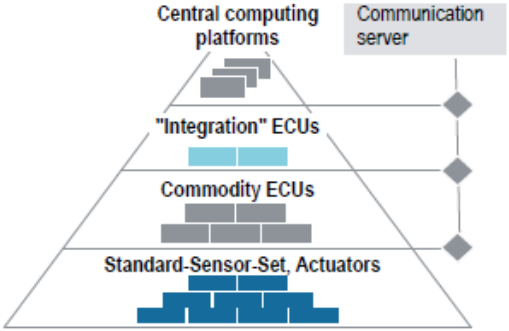
48 V drivers – autonomous



48 V for Autonomous Driving
Optimized Computer Power



Overall EE Architecture
Level 3,4 Autonomous Driving



Integrated Solutions for ADAS incl. Sensor Fusion, Environmental, Driver, Vehicle Model

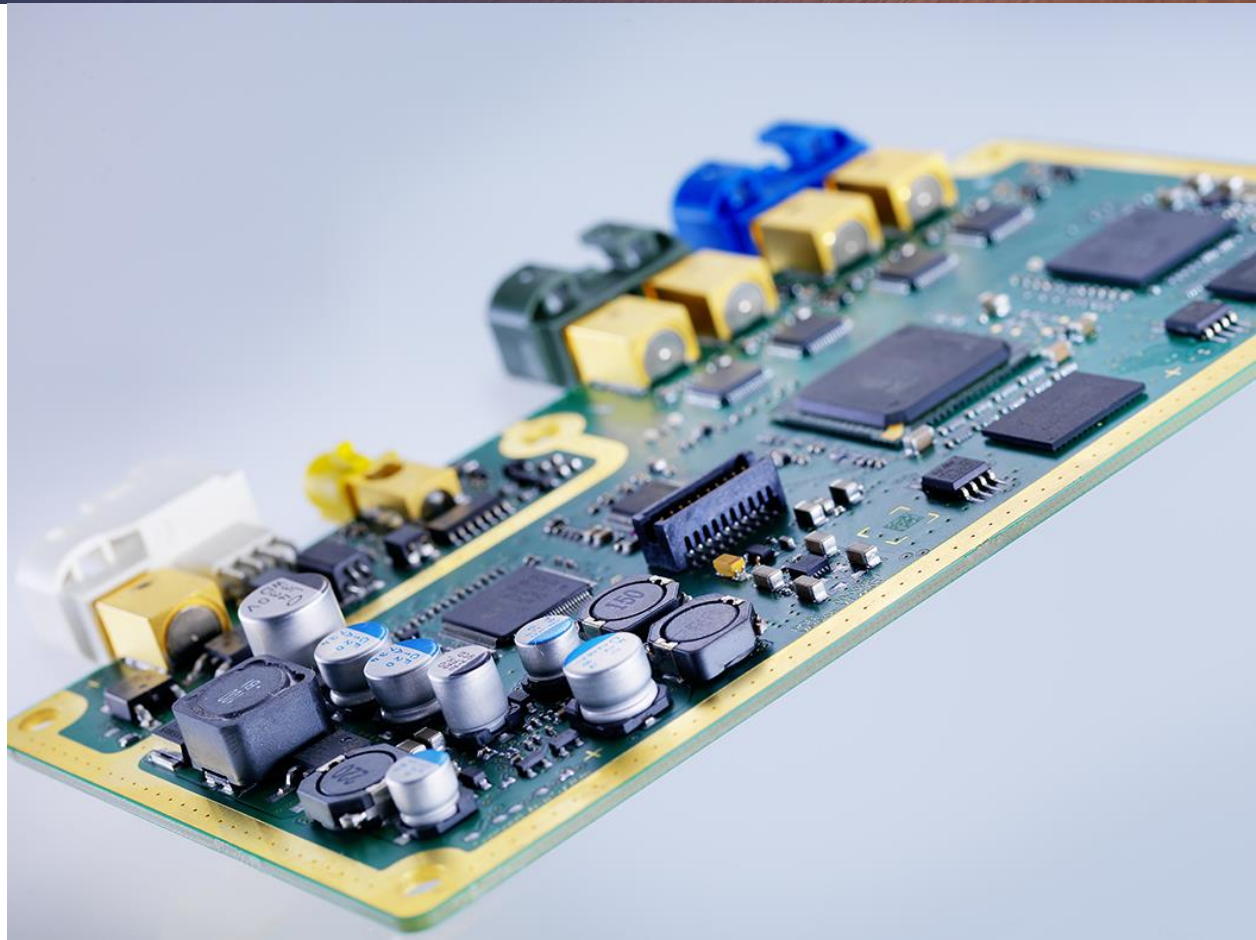
Reduction Enablers

- Cloud based vs vehicle based solutions
- Flexible Compute Architecture
- Advanced Sensor Fusion
- Improved Algorithm
- Next Generation Sensors

48 V for Autonomous Driving
ADAS Domain Controller

Key Performances

- Heterogeneous multiprocessor platform
- Significant scalability
- Deep learning applications
- Cost optimized component



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Expected Penetration Rates of 48 V

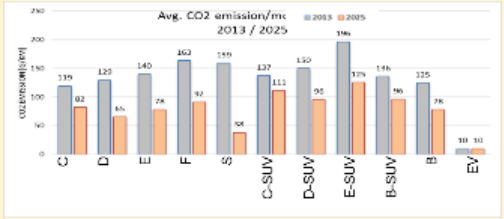
Penetration Rates of 12 V vs 48 V

OEM n

OEM 2

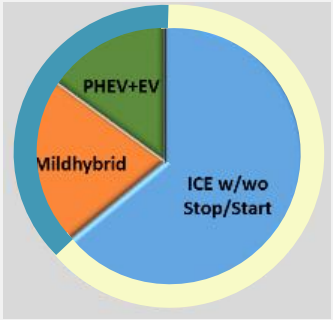
OEM 1

CO_2 Fleet Analysis
per Region

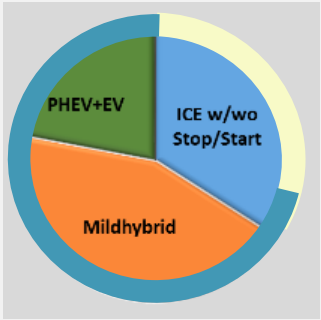


Technology Scenarios
per Model / Powertrain

Power Supply in 2025



Complete Market



Premium OEM

12 V 48 V

ICE Internal combustion engine

Premium OEMs have higher need for 48 V
Due to CO_2 legislation there is also the need of 48 V in Volume market vehicles

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Summary

Summary 48 V

- The power supply today is already on the limit
- In future we have a high power request by CO_2 reduction on ICE, 48 V hybrid, autonomous driving, active chassis control and a lot of comfort functions
- A further improvement of power efficiency of all components is required. Together with a 48 V power supply strategy this enables “high value“ end consumer functionality

48 V Power Supply enables a NEW End Consumer Experience in the Car of the Future


DRIVING **EXCELLENCE.**
INSPIRING **INNOVATION.**