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ECS 2024 GHENT BELGIUM 5-6 December

FEDERATE

Software defined Vehicle of the Future Initiative - Overview

Michael Paulweber, AVL List GmbH | Andreas Eckel, TTTech Computertechnik AG

Dec 5th, 2024

Challenges for Software-defined-Vehicle and ADAS/AD

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Costs for non-differentiating software increasing over proportionally

Lack in speed and technology

Classical V-process not good enough anymore, but automotive grade quality still required

Huge investments required, IT hyper-scalers push into market

Vehicles continue to grow in functionality in the field (OTA)

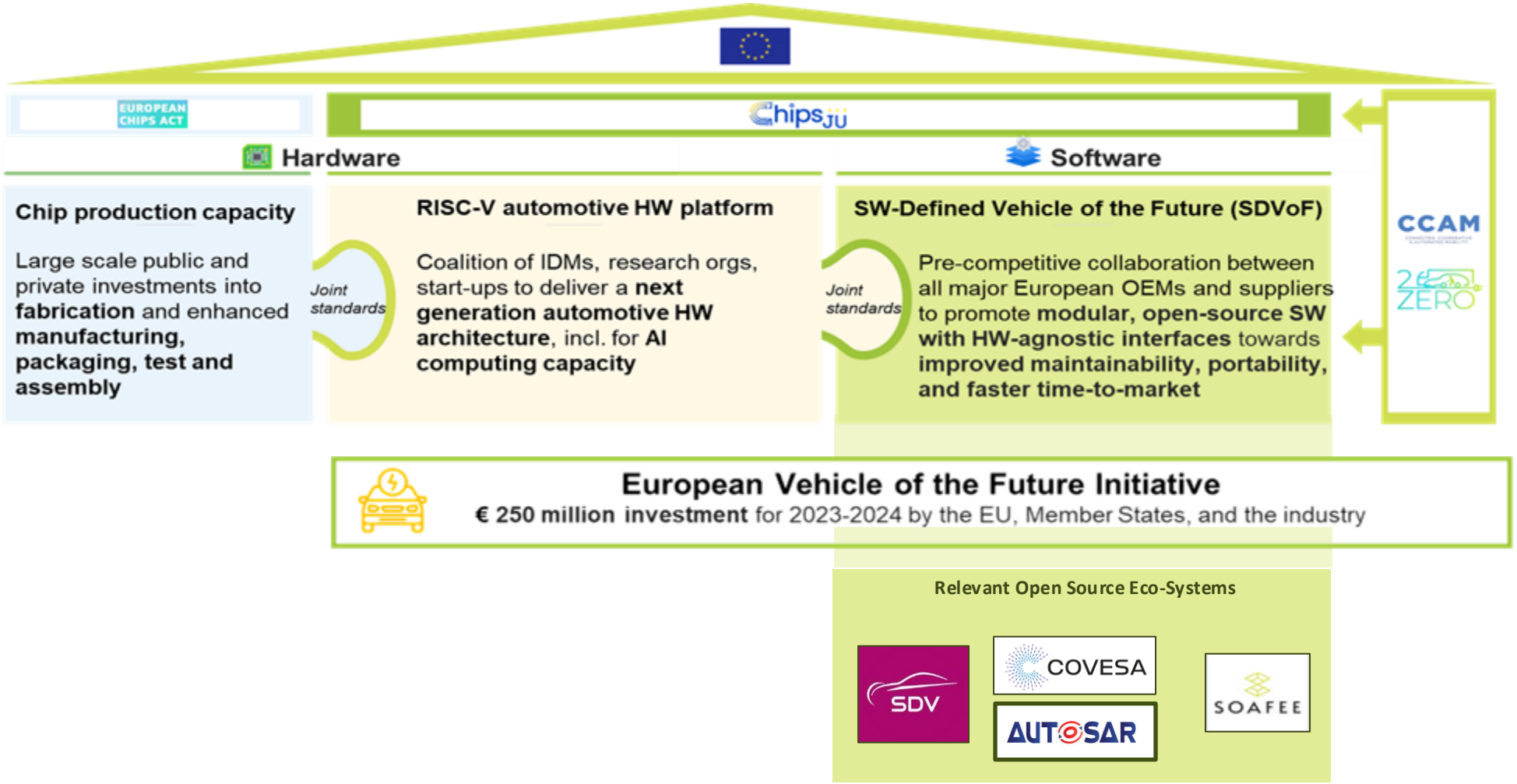
Software complexity increasing exponentially

New centralized EE-architectures

(Generative) AI offers many new possibilities

Software replaces „horsepower“ in consumer decisions

European Commission and Industry took on the challenge



A common Vision and Roadmap for a European driven SDV SW Platform

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Published and openly accessible

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Software

SW-Defined Vehicle of the Future (SDVoF)

Pre-competitive collaboration between all major European OEMs and suppliers to promote **modular, open-source SW with HW-agnostic interfaces** towards **improved maintainability, portability, and faster time-to-market**

CCAM

2ZERO

Relevant Open Source Eco-Systems

SDV

COVESA

AUTOSAR

SOAFEE

Strong Commitment from Automotive Industry:

Declaration of the European Automotive Manufacturers and Suppliers

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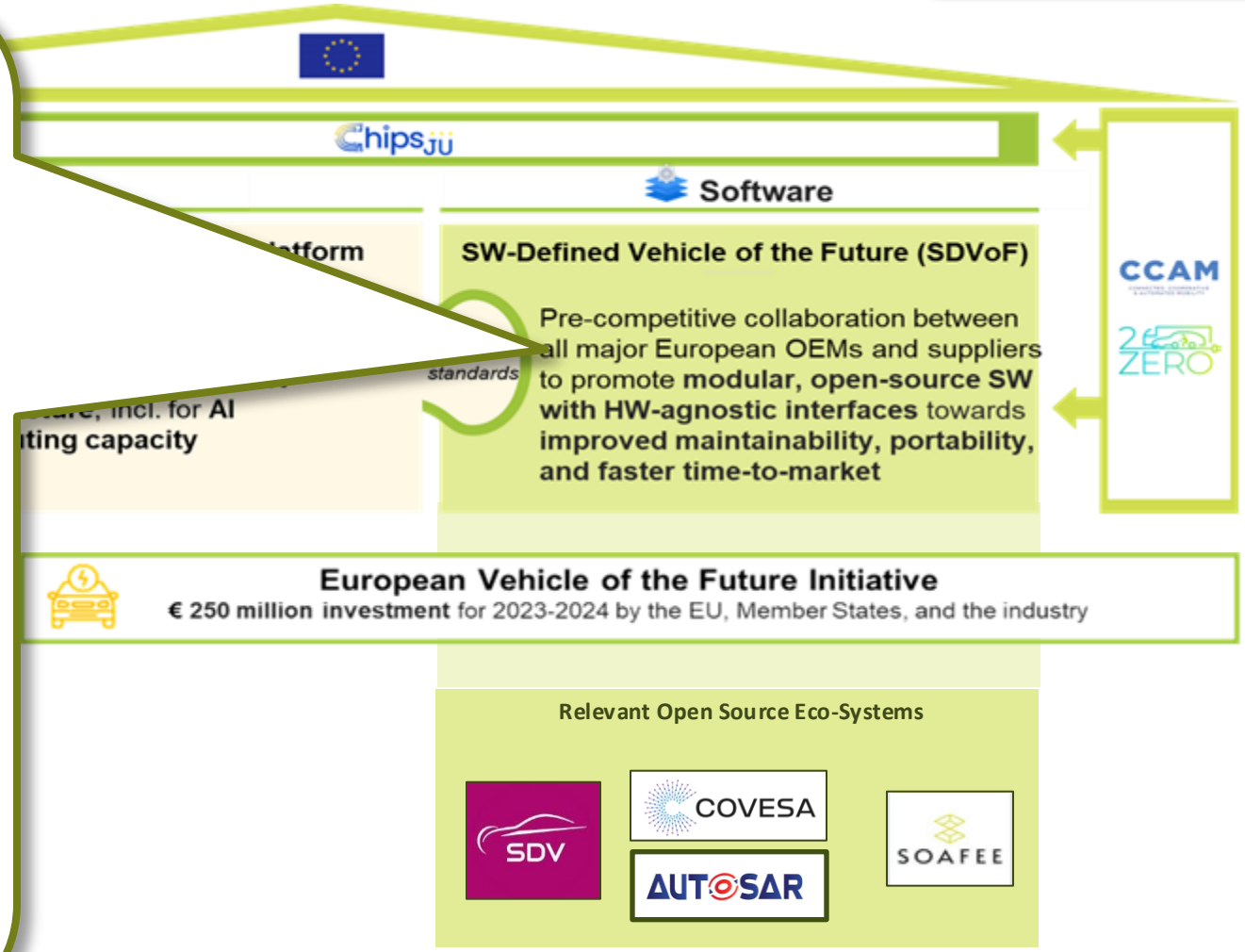
Signatories of Manifesto

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



Defined Roadmap for the Implementation of the European driven SDVoF Software platform

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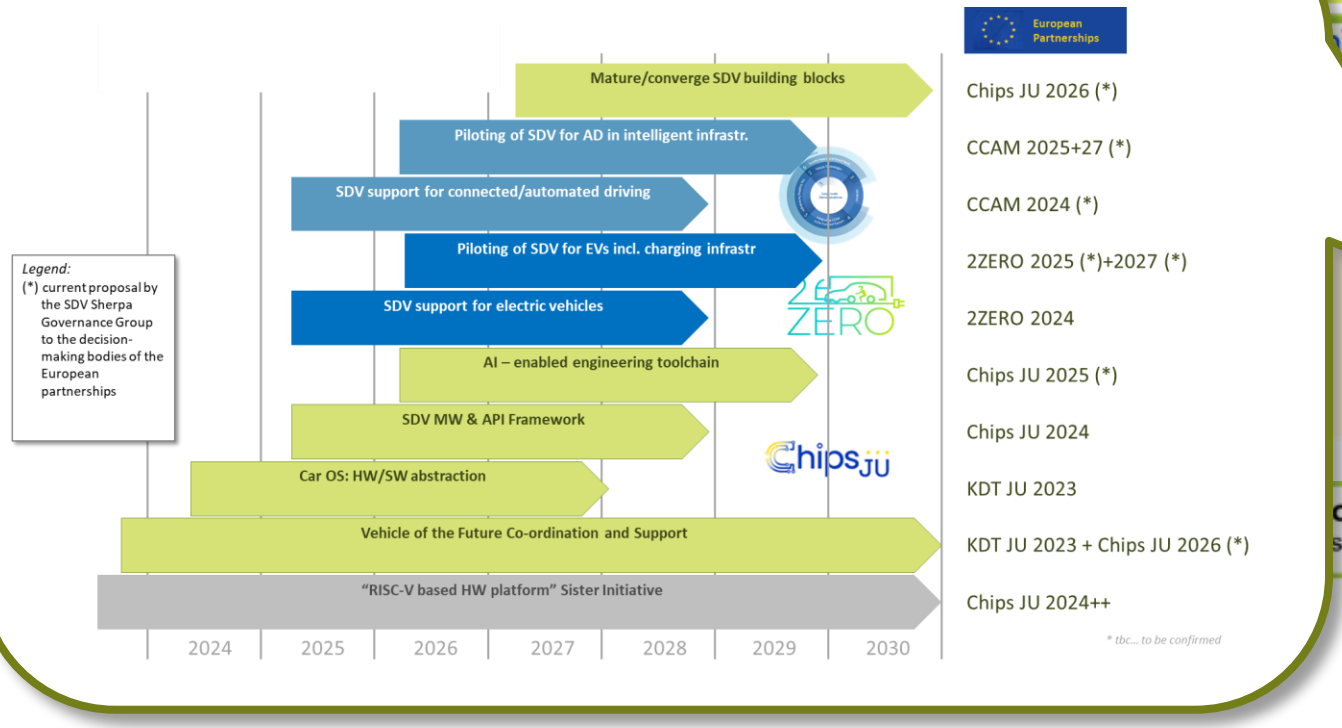

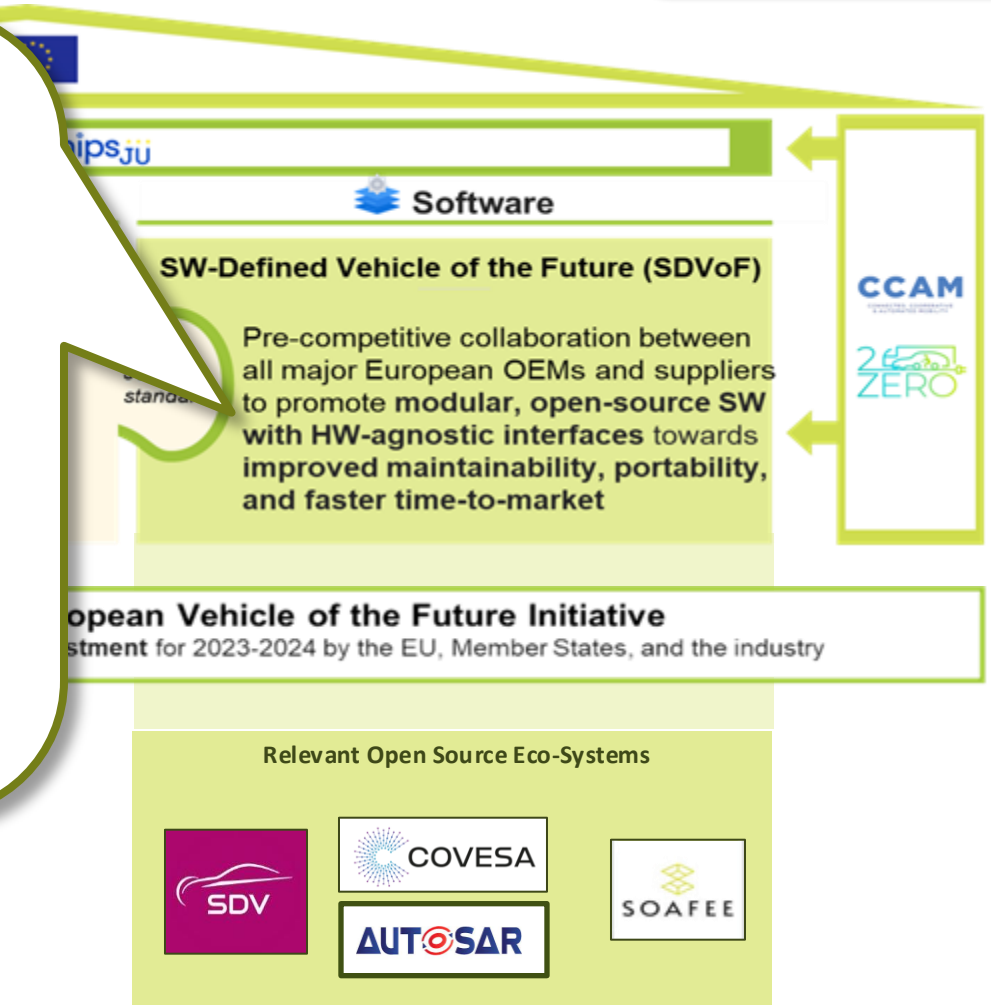

European driven “Software-defined-Vehicle of the Future” Initiative

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Differentiating

OEM specific

SDV Application SW

(Automated driving / ADAS, Body / Chassis, Powertrain, Cockpit / Infotainment)

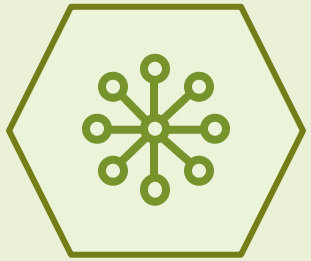
Functional abstraction

SDVoF

Initiative

SDVoF SW platform

SDVoF Eco-System

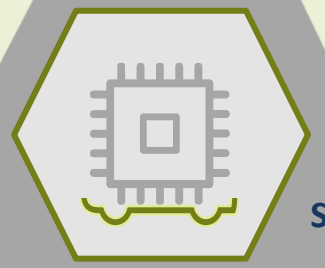


HW/SW abstraction

SDVoF Engineering platform (AI supported)

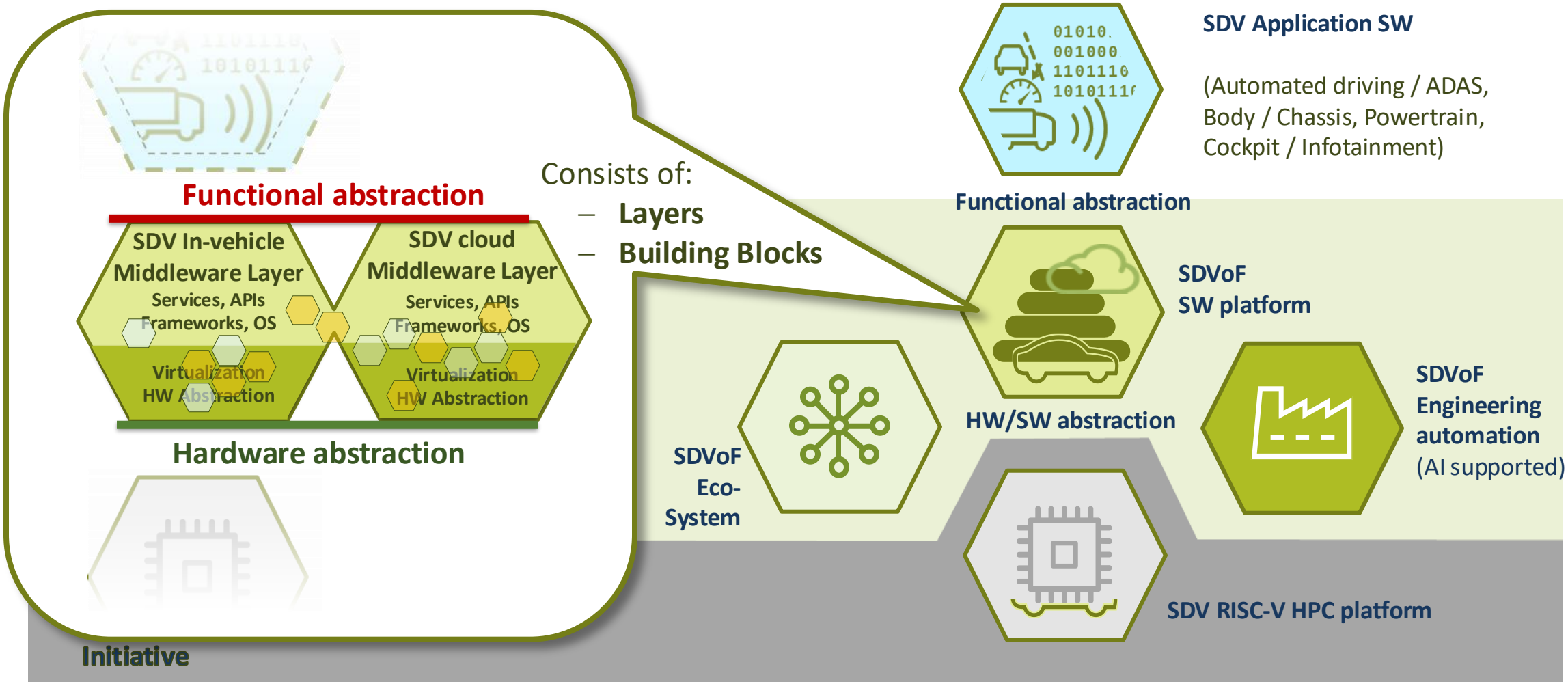
RISC-V

Initiative

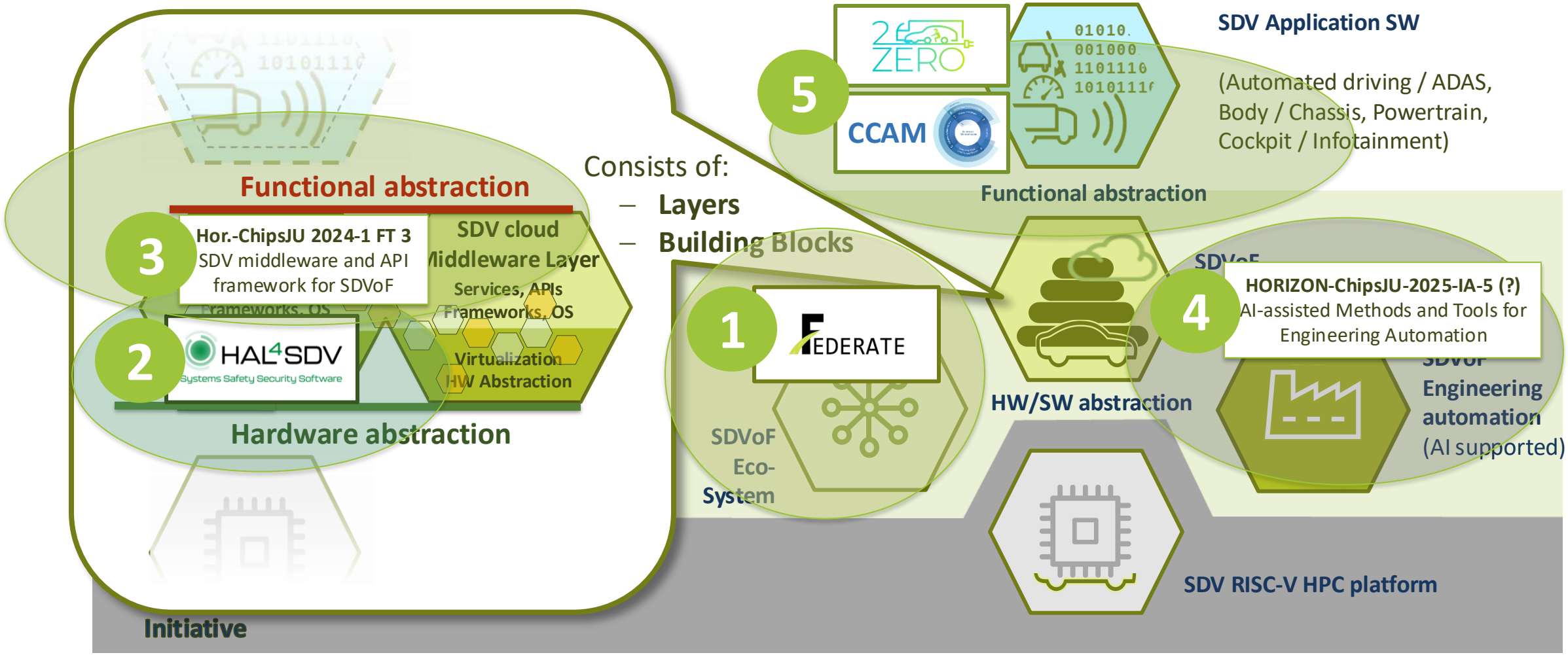


SDV RISC-V HPC platform

European driven “Software-defined-Vehicle of the Future” Initiative



European driven “Software-defined-Vehicle of the Future” Initiative



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ELECS 2024 GHENT BELGIUM
5-6 December

HAL4SDV
Systems Safety Security Software

HAL4SDV-Project

Andreas Eckel, TTTech Computertechnik AG

2024-12-05

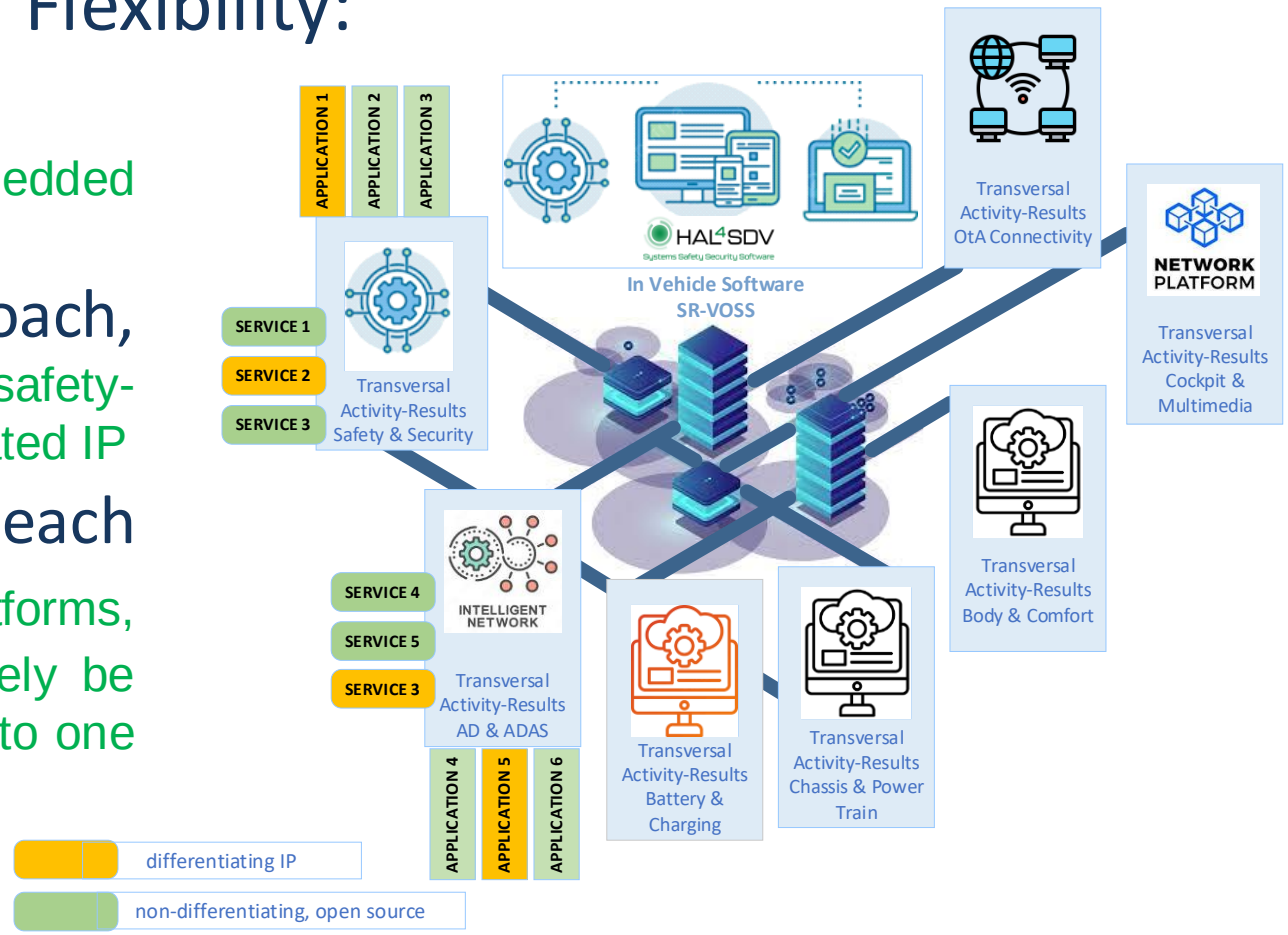
HAL⁴SDV Change of USPs

Vision of a Concept with Maximum Flexibility:

a) Free configurable, flexible concept,
combining different modules resulting in an embedded system partly using Service oriented Architecture

b) Enables open-source and IP approach,
combining both worlds, non-differentiating, non- safety-related open-source and differentiating, safety-related IP

c) Offers differentiating solutions for each OEM at maximum communality: Platforms, Service Modules & all SW components can freely be selected on the supplier's market and composed to one unique, embedded, in-vehicle system



HAL⁴SDV in a Nutshell

Coordination: Andreas Eckel, TTTech Computertechnik AG

Project Office: Armengaud Innovate GmbH

50 Partners:

- **5 OEMs** (Renault/Ampere, BMW, Mercedes, Ford Otosan)
- **6 Tier 1** (Valeo-FR, ETAS/Bosch, CONTI, ZF, AVL-AT, AVL-DE)
- **5 semiconductor manufacturers** (IFAG, NXP-NL, NXP-FR, NXP-CZ and ST-I)
- **8 Software and Technology providers** (TAAG, TCAG, Sysgo-DE, EB-DE, 3DS, CSW, TAES, TADE)
- **9 SMEs** (StatInf, RES, ROVI, STTech, Tensor, TERA, TrustInSoft, DIMECC and Unikie)
- **16 academic partners and research institutes** (CEA, CSIC, FZI, VIF, TUM, USTUTT, UniMore, ISEP, KIT, Polimi, Polito, Unibo, TUE, TUOstrava, UOULU, INRIA)
- **1 Foundation**: Eclipse

3 Affiliated Partners: UniCA, Sysgo-FR, NXP-FR

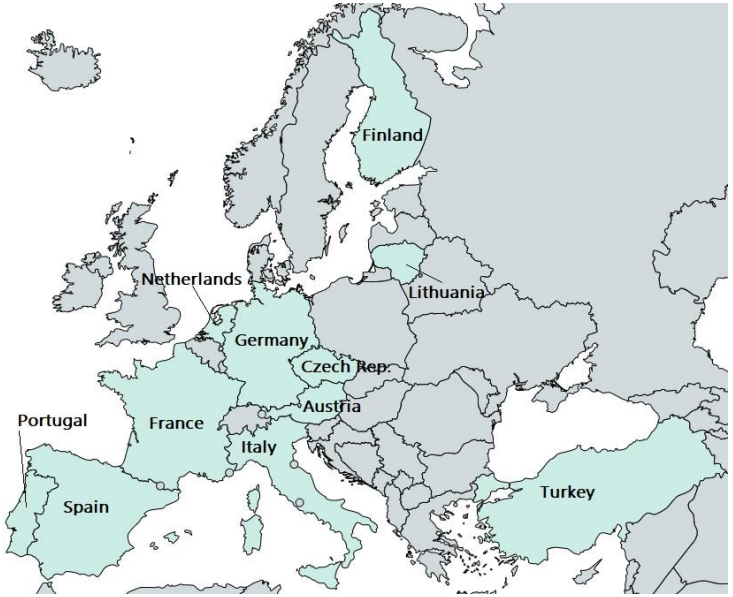
9 Associate Partners: Forvia, BSC, DLR, Volvo, FH-IKS, ARM, TUB, VDA, TWT

11 Countries: Austria, Check, Germany, Finland, France, Italy, Lithuania, Portugal, Spain, Turkey,

Project Start/Duration: 2024-04-01/36 months

Total Budget: ~ €64,5 Mio

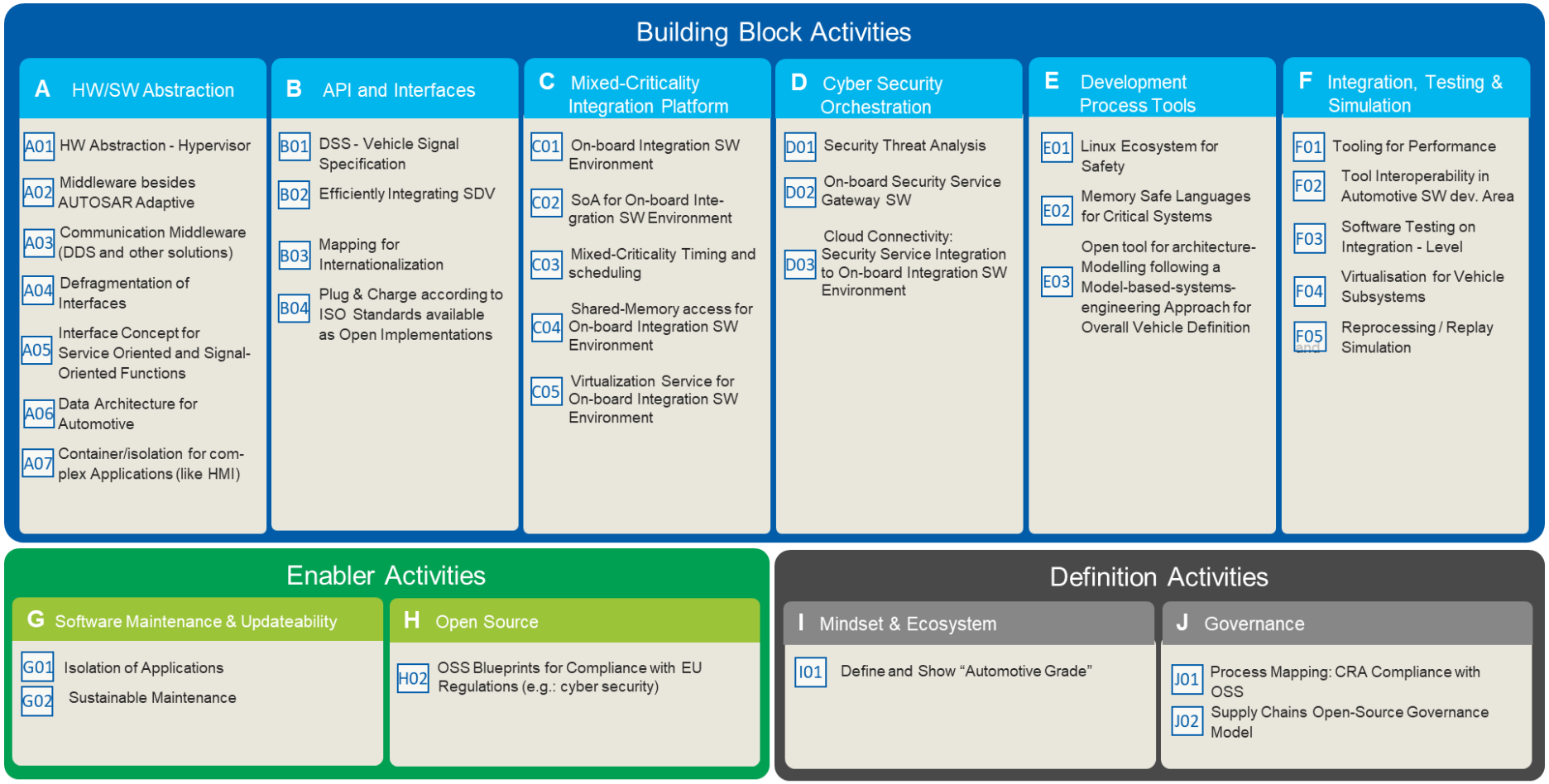
EC Contribution: ~ €17,8 Mio



HAL4SDV Structure

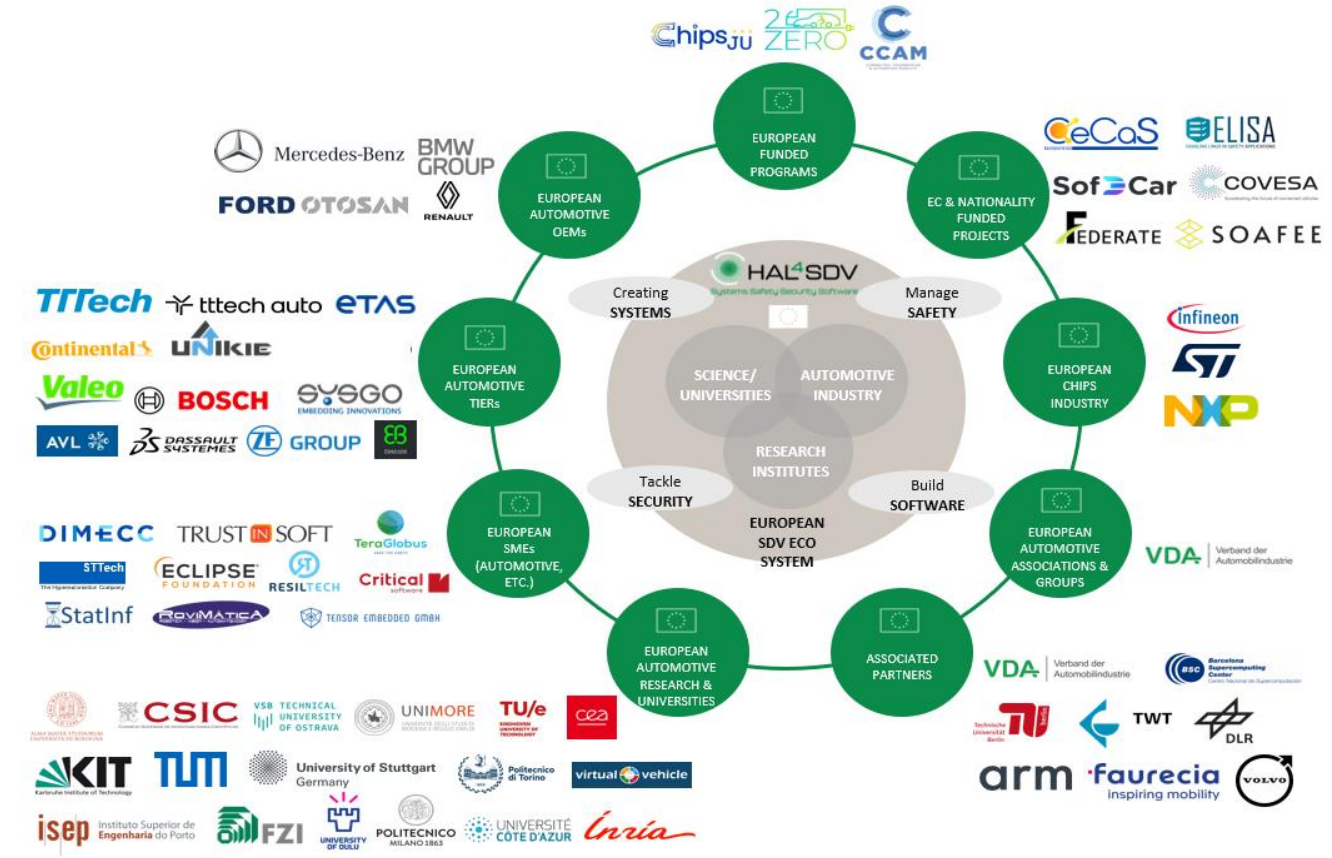
HAL4SDV Content Overview

HAL4SDV
Systems Safety Security Software



HAL⁴SDV Expected Impact

1) **Building a European Eco System:**
   reduce critical mass
2) **Enhance green- & digital- transformation:**
   - Reuse & use longer mechanical vehicle HW
   - "New cars" by SW updates & enhancements/new functions
   - Drive "circularity"
3) **Enhance/stimulate research & innovation**
4) **Stimulate open source for product implementation**
5) **Accelerate market uptake of technologies**



Thank you for your Attention

Contact details FEDERATE:
Michael Paulweber,
AVL List GmbH,
email: michael.paulweber@avl.com

Contact details HAL4SDV:
Andreas Eckel,
TTTech Computertechnik AG,
email: andreas.eckel@tttech.com