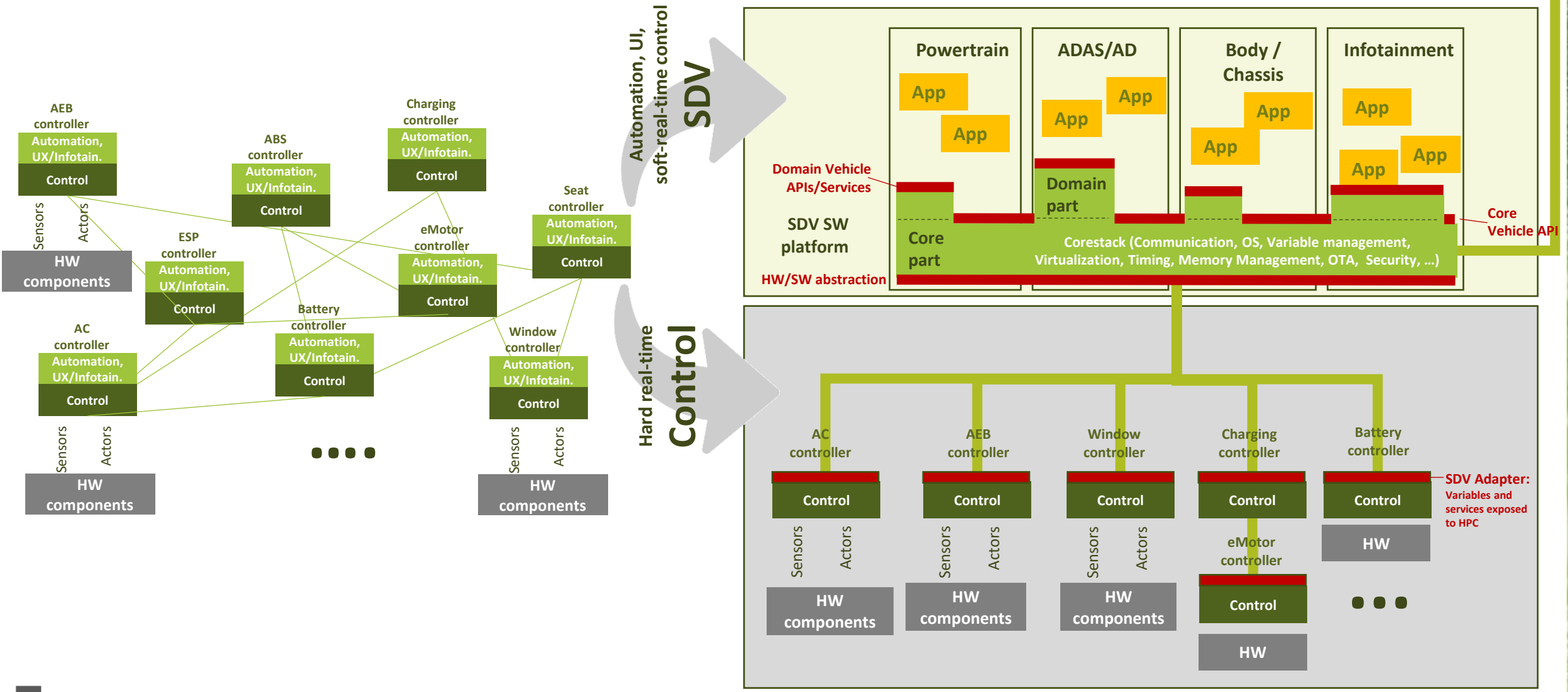# Status:
Digital Vehicle SDV SW platform Initiative and Federate

2nd European SDV Ecosystem Summit @ Federate | Munich | May 20th, 2025

Michael Paulweber

HW/SW Structure of Software defined Vehicles
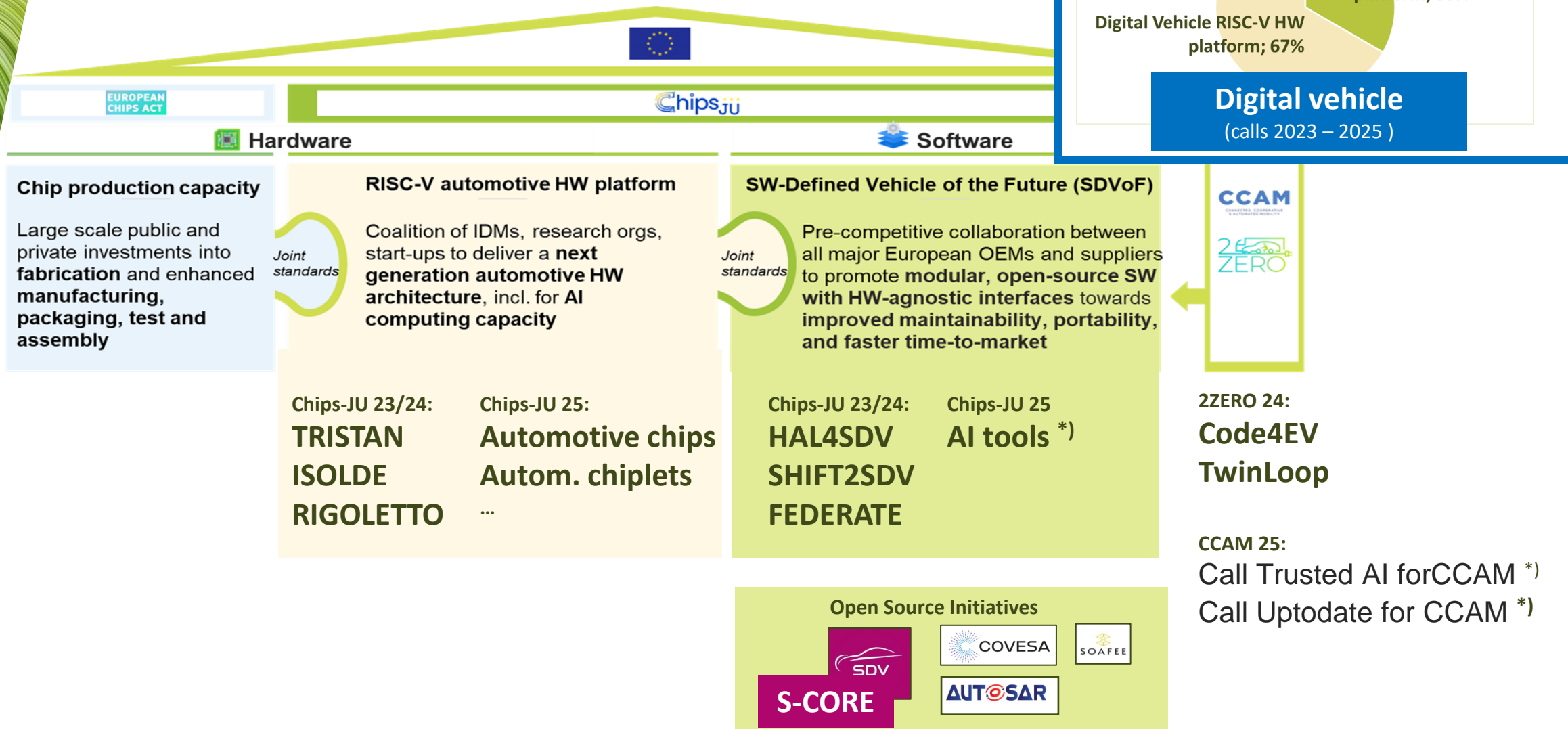
Automation, UI, … moves to Central HPC

Two Speed Software Delivery Model

SDV-SW

„Software first"
AUTOMATION, UI, soft real-time, agile, SW only
ADAS/AD, body comfort chassis, multimedia, cockpit

Controller-SW + Mechantronics HW

„SOP driven"
CLOSED LOOP CONTROL, hard real-time, **mechatronics + SW** devel.
Powertrain, battery, chassis

Source: Two Speed Delivery Model; Augustin Friedel, MHP (Porsche); https://www.sdv.guide/sdv101/part-a-essentials/mhp-expert-opinion ; 2024

SDV Project Ecosystem

European Commission, member states and Industry took on the challenge

Digital Vehicle SDVof SW platform; 33%

Digital Vehicle RISC-V HW platform; 67%

Digital vehicle (calls 2023 – 2025)

Chipsju

Hardware | **Software**

EUROPEAN CHIPS ACT

Chip production capacity

Large scale public and private investments into **fabrication** and enhanced manufacturing, packaging, test and assembly

Joint standards

RISC-V automotive HW platform

Coalition of IDMs, research orgs, start-ups to deliver a **next generation automotive HW architecture**, incl. for **AI computing capacity**

Joint standards

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
CONNECTED, COOPERATIVE & AUTOMATED MOBILITY

2ZERO

Chips-JU 23/24:	Chips-JU 25:	Chips-JU 23/24:	Chips-JU 25
TRISTAN	**Automotive chips**	**HAL4SDV**	**AI tools** [*]
ISOLDE	**Autom. chiplets**	**SHIFT2SDV**	
RIGOLETTO	...	**FEDERATE**	

2ZERO 24:
Code4EV
TwinLoop

CCAM 25:
Call Trusted AI forCCAM [*]
Call Uptodate for CCAM [*]

Open Source Initiatives

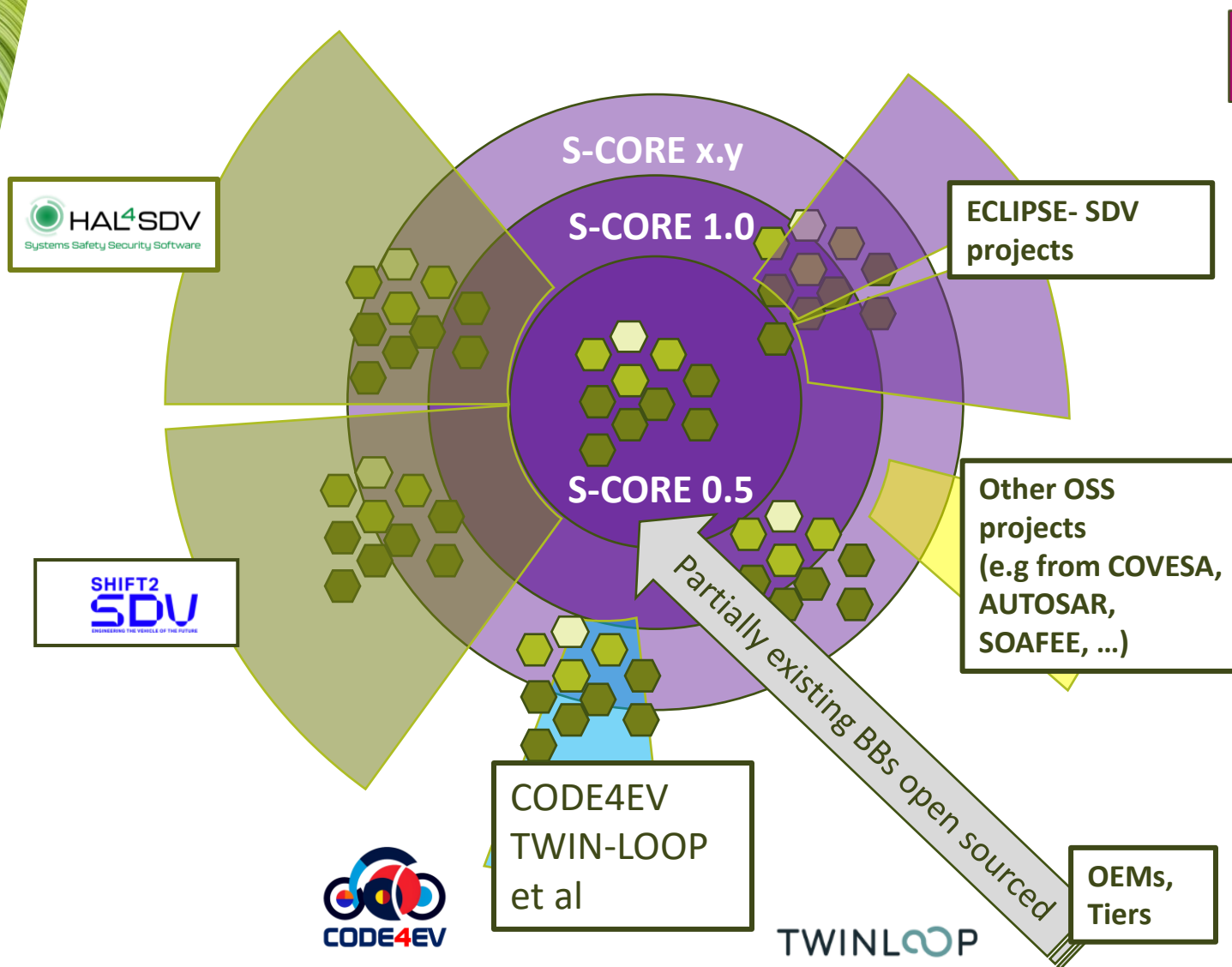**S-CORE** | **COVESA** | **SOAFEE** | **AUTOSAR**

Digital Vehicle ≈ 690 Mill € (EC+Partic.states+Industry/Academia)

[*] *Calls still open*

How are Digital Vehicle (SDVoF) projects contributing ?

Integrate and test SDV stacks in use cases — 2

OSS BBs repos

Develop non-OSS OSS building blocks

Develop OSS building blocks and contribute — 1

Specify SDV use cases
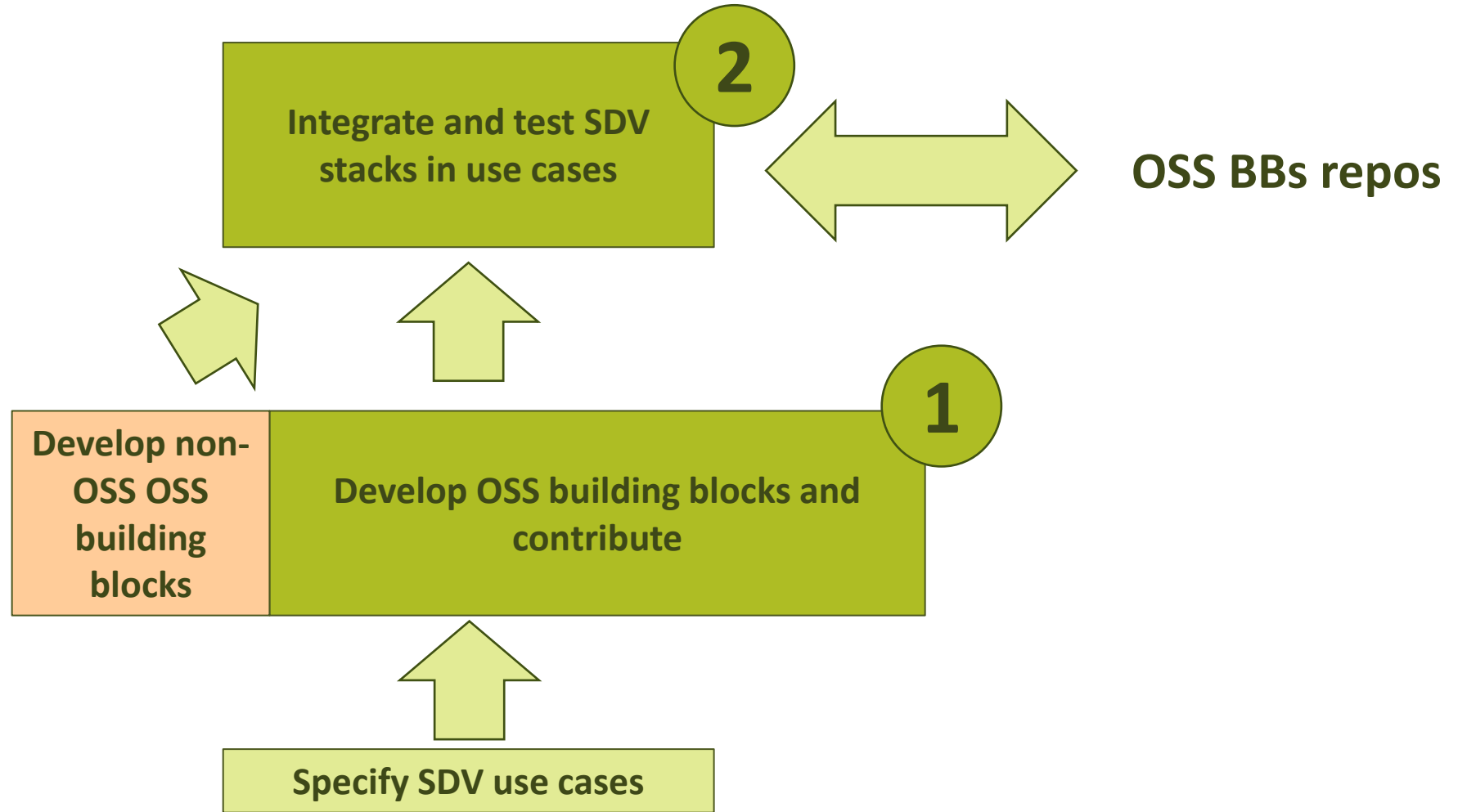
Grow the SDV reference stack(s) collaboratively

- S-CORE is first integration project for a SDV reference stack
- S-CORE stack is open-source (ECLIPSE-SDV project)
- S-CORE has a roadmap

- Tasks in EU SDV projects shall contribute to the reference stack
  - Many BB-tasks are also new Eclipse-SDV projects (or in another OSS initiative)
  - Other BB-tasks is working in an existing Eclipse-SDV project (or in another OSS initiative)

S-CORE x.y
S-CORE 1.0
S-CORE 0.5

ECLIPSE- SDV projects

Other OSS projects (e.g from COVESA, AUTOSAR, SOAFEE, …)

HAL⁴SDV
Systems Safety Security Software

SHIFT2 SDV
ENGINEERING THE VEHICLE OF THE FUTURE

CODE4EV
TWIN-LOOP et al

CODE4EV

TWINLOOP

Partially existing BBs open sourced

OEMs, Tiers

SDV EC projects and S-CORE (and other OSS initiatives) work together

Public funded (EC) SDV projects

- Identify BB from use-cases
- Identify existing or new OSS projects for OSS BBs
- Regularly align with OSS projects (architecture, timeline, interfaces, …)
- Develop and test BBs
- Create stack for use-cases with OSS BBs and project specific non-OSS BBs
- Test use case stacks

S-CORE

- Identify need for support in BB development by EC SDV projects (actively driven from OEMs and Tiers in both Eclipse-SDV and EC SDV projects)
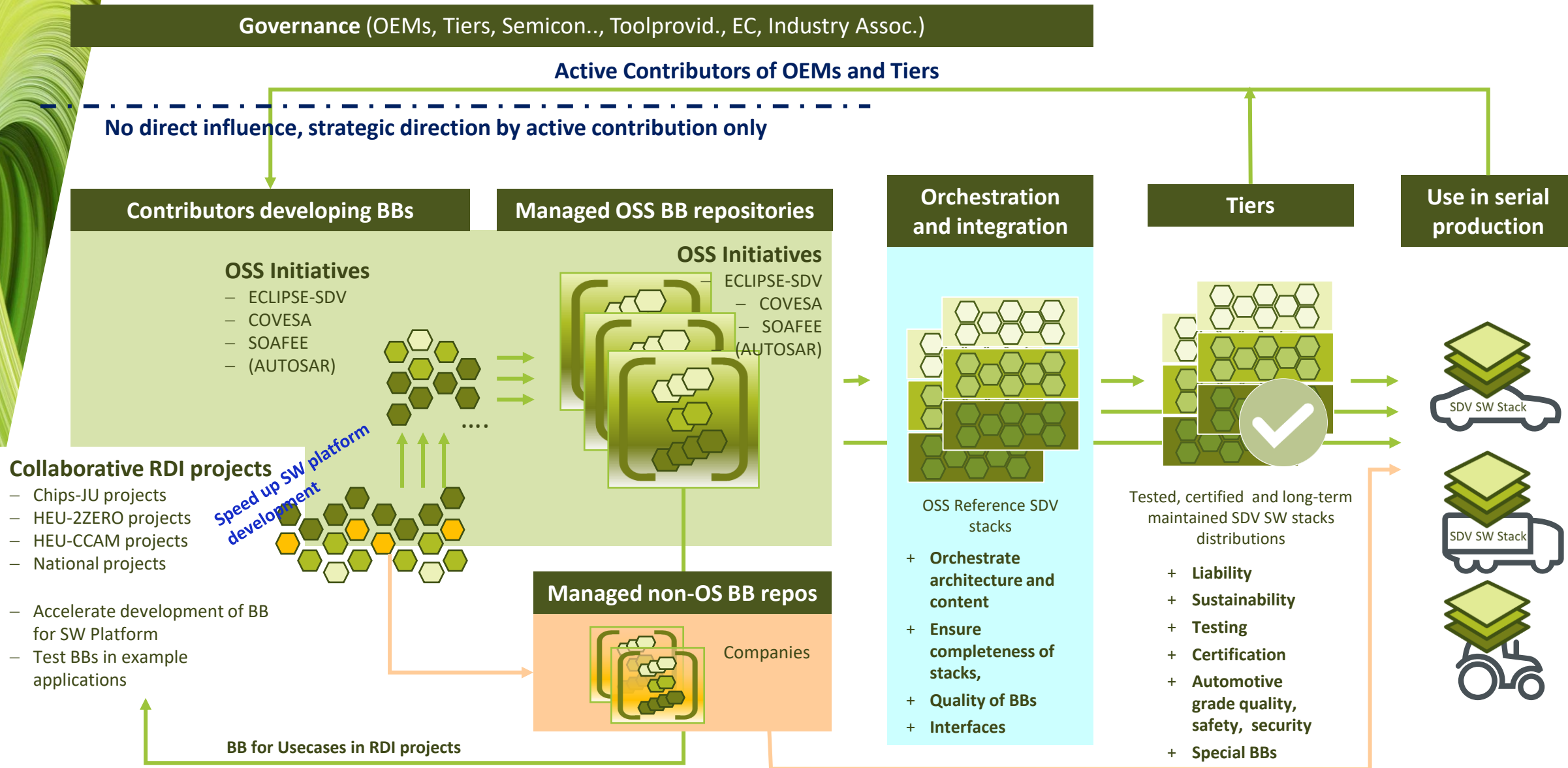- Provide information to EC SDV projects about S-CORE stack, interfaces, integration process and tools

Do ut des

"I give so that you may give …."

Can it work?

How to make OSS attractive for automotive

Stakeholders	"I give …	… that you may give"
OEMs	Actively contribute by assigning resources for SW development and maintenance; Requirements; Use-cases	Reduce development costs for SDV SW platform by sharing costs
Tiers	Actively contribute in assigning resources for SW development and maintenance	Opportunity to sell integration services, testing, apps and building blocks
Academia	Develop building blocks, integrate new technologies (AI, …); Train students in SDV	Get interesting topics to attract students and write publications Public funding
OSS initiatives	Processes and experience in OSS; Technology advice; Community building experience	Increase ecosystem for OSS Opportunities for members to sell apps
Tool providers	Actively contribute by assigning resources for SW development and maintenance; Developm.methods	Save costs and gain speed in using OSS tools from IT Opportunity to sell integration services, apps
Engineering service provider	Train resources in participating in OSS projects	Opportunity to sell expert services to OEMs

SDV development process flow

Governance (OEMs, Tiers, Semicon.., Toolprovid., EC, Industry Assoc.)

Active Contributors of OEMs and Tiers

No direct influence, strategic direction by active contribution only

Contributors developing BBs

OSS Initiatives
- ECLIPSE-SDV
- COVESA
- SOAFEE
- (AUTOSAR)

....

Speed up SW platform development

Collaborative RDI projects
- Chips-JU projects
- HEU-2ZERO projects
- HEU-CCAM projects
- National projects

- Accelerate development of BB for SW Platform
- Test BBs in example applications

Managed OSS BB repositories

OSS Initiatives
- ECLIPSE-SDV
- COVESA
- SOAFEE
- (AUTOSAR)

Managed non-OS BB repos

Companies

BB for Usecases in RDI projects

Orchestration and integration

OSS Reference SDV stacks

+ **Orchestrate architecture and content**
+ **Ensure completeness of stacks,**
+ **Quality of BBs**
+ **Interfaces**

Tiers

Tested, certified and long-term maintained SDV SW stacks distributions

+ **Liability**
+ **Sustainability**
+ **Testing**
+ **Certification**
+ **Automotive grade quality, safety, security**
+ **Special BBs**

Use in serial production

SDV SW Stack

SDV SW Stack

Other Federate Activities
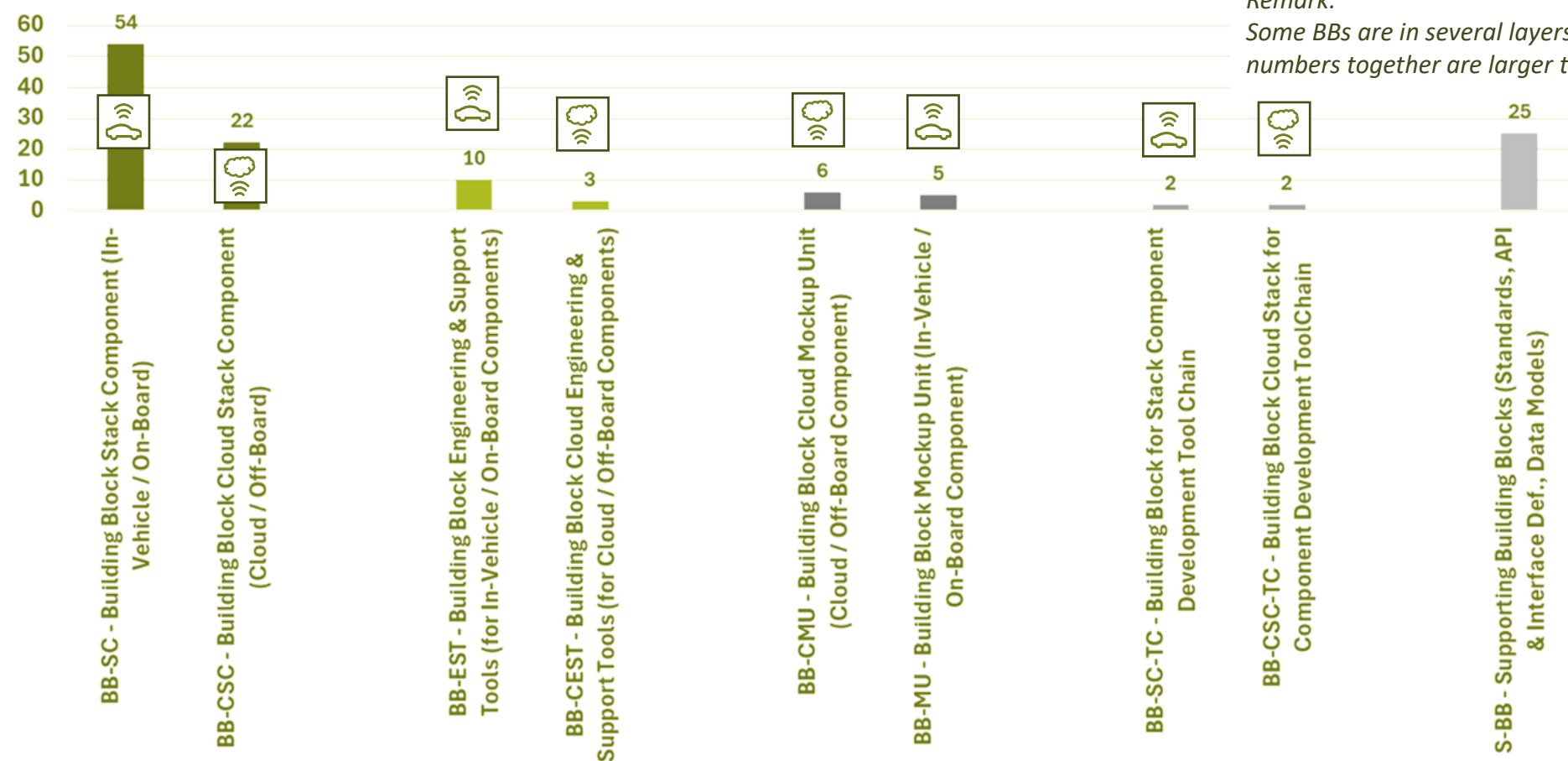
Alignment Meetings with Stakeholders
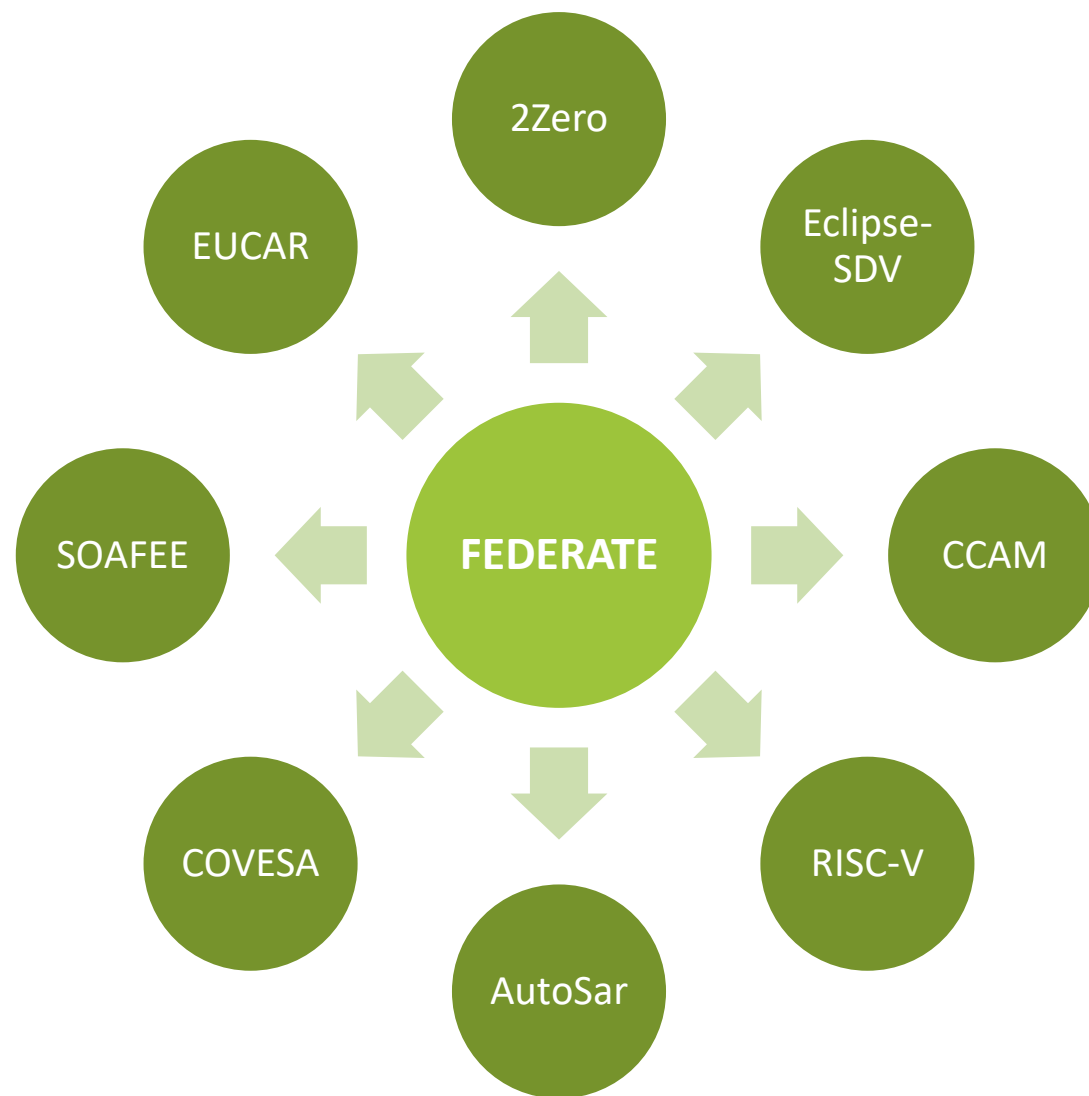
Building Block inventory on Github

Status: Feb 5th, 2025

Remark:
Some BBs are in several layers, therefore these numbers together are larger than number of BBs

Chart values:
- 54 — BB-SC - Building Block Stack Component (In-Vehicle / On-Board)
- 22 — BB-CSC - Building Block Cloud Stack Component (Cloud / Off-Board)
- 10 — BB-EST - Building Block Engineering & Support Tools (for In-Vehicle / On-Board Components)
- 3 — BB-CEST - Building Block Cloud Engineering & Support Tools (for Cloud / Off-Board Components)
- 6 — BB-CMU - Building Block Cloud Mockup Unit (Cloud / Off-Board Component)
- 5 — BB-MU - Building Block Mockup Unit (In-Vehicle / On-Board Component)
- 2 — BB-SC-TC - Building Block for Stack Component Development Tool Chain
- 2 — BB-CSC-TC - Building Block Cloud Stack for Component Development ToolChain
- 25 — S-BB - Supporting Building Blocks (Standards, API & Interface Def., Data Models)

BBs for:

SW platforms (In-vehicle & Cloud)	Engineering Support (In-vehicle & Cloud)	Mockup BBs	Development toolchain	Suppporting BBs (Data models, …)

Communication and Social Media

FEDERATE Website with 200 - 300 visitors/month

FEDERATE Building Block Inventory on GitHub

FEDERATE Roll-ups

FEDERATE sharepoint serves as internal communication platform

FEDERATE CONSORTIUM

6 Newsletters with ~350 recipients (quarterly)

LinkedIn with **1023** follower, ~2 postings per week

Contribution by FEDERATE to SDV Community

☑ 1 - Common understandi...
☑ 2 - Vibrant SDV Community i...
☑ 3- Self-sustaining European initiative, providing adoption and continuous c...

Open SDV ecosystem forum with ~ 330 subscribers

FEDERATE Videos

FEDERATE Brandbook

AVL

FEDERATE

Thank You