



#HorizonEU

HORIZON EUROPE

THE EU
RESEARCH & INNOVATION
PROGRAMME

2021 – 2027

ROAD TRANSPORT
PARTNERSHIPS

MAURIZIO MAGGIORE
EC – DG R&I, UNIT C2

Meeting with CDTI
5 June 2023

Research and
Innovation

Policy Context





General policy context



December 2019

- Increasing the uptake of **zero-emission vehicles**
- Making **sustainable alternative solutions** available to the public & businesses
- Supporting **digitalisation & automation**
- Improving **connectivity & access**

February 2020

- Establishment of EU-wide common, interoperable data spaces including a **Common European mobility data space**
- Review of the ITS Directive and its Delegated Regulations
- Stronger coordination mechanism **federating National Access Points**

December 2020

- Making the EU transport system **sustainable, smart and resilient**
- **Automated mobility** deployed at large scale by **2030**
- **82 initiatives** in 10 key areas
- Deployment and management of ITS and connected and automated mobility, facilitate cross border AV, recharging infrastructure, 5G

December 2020

- Deliver at least **100 climate-neutral and smart European cities** by 2030
- Ensure these cities are **experimentation and innovation hubs** to support all European cities to become climate-neutral by 2050.
- **112 Mission Cities** selected

Green Deal – EU Climate Neutral by 2050

European Climate Law: 55% reduction of emissions by 2030

The green transition is major **opportunity** for **European industry**: markets for clean technologies and products

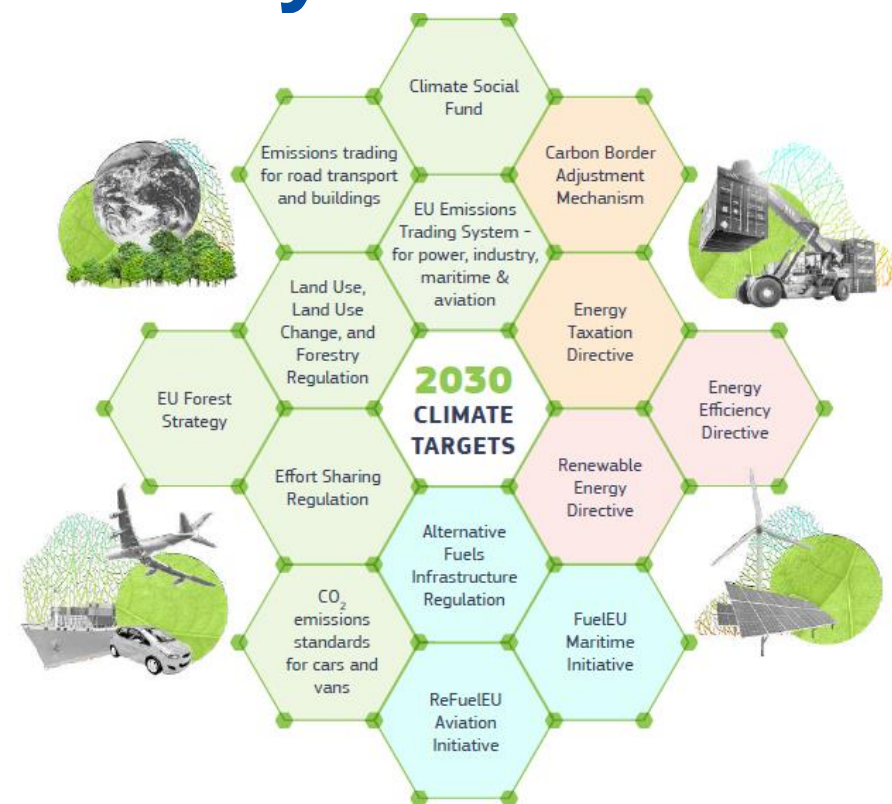
Transition to **greener mobility** aims at offering **clean, accessible and affordable transport** even in the most remote areas

1990-2019: **transport GHG emissions up by 34%**; 30% of the EU's GHG emissions (vs 18% in 1990)

Road: 72%, Air 13%, Maritime 14%, Rail 1%

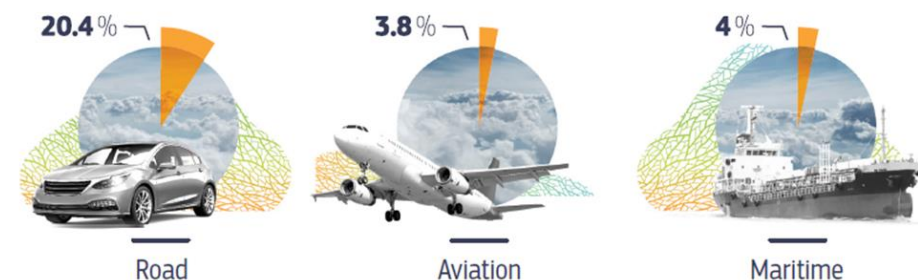
Under current trends, by 2030 transport emissions are forecast to be **10% higher than in 1990**

REpowerEU: cleaner energy, industrial competitiveness and technology leadership



TRANSPORT NEEDS TO CUT EMISSIONS BY 90% BY 2050

Share of total EU Greenhouse Gas (GHG) emissions, per mode



Sustainable and Smart Mobility Strategy

A clean, digital and modern economy for the EU transport sector.

82 initiatives in 10 key areas for action (“flagships”) including:

- **By 2030**

- **30 million zero-emission cars** will be in operation on European roads by 2030 and **80000 zero-emission lorries** in operation.
- **100 European cities** will be climate neutral by 2030
- **automated mobility** will be deployed at large scale
- 3 million **public recharging points** and 1 000 **hydrogen** stations

- **By 2050**

- nearly all cars, vans, buses as well as new heavy-duty vehicles will be **zero-emission**
- the multimodal **Trans-European Transport Network (TEN-T)** equipped for sustainable and smart transport with high speed connectivity will be operational.



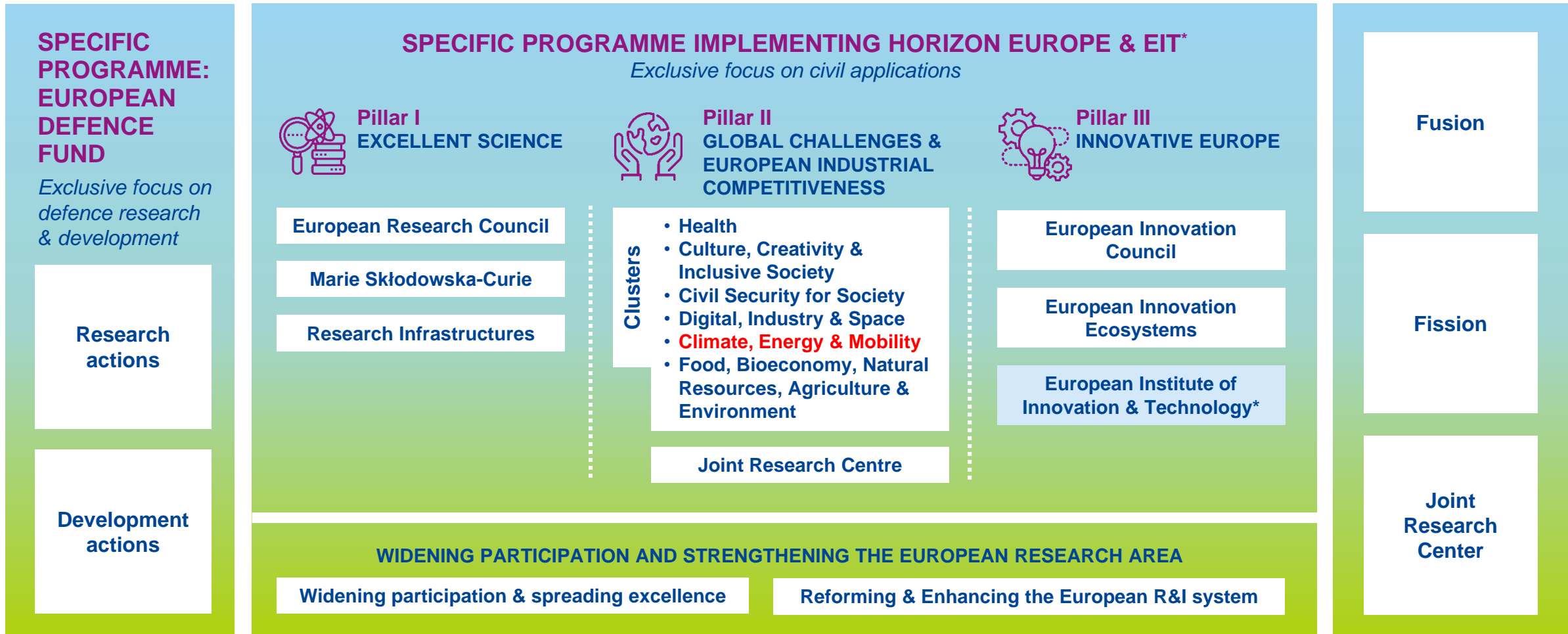
**“AN IRREVERSIBLE SHIFT TO
ZERO-EMISSION MOBILITY”**

Horizon Europe Programme



HORIZON EUROPE

EURATOM



* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme

Implementation: WP, Partnerships and Missions

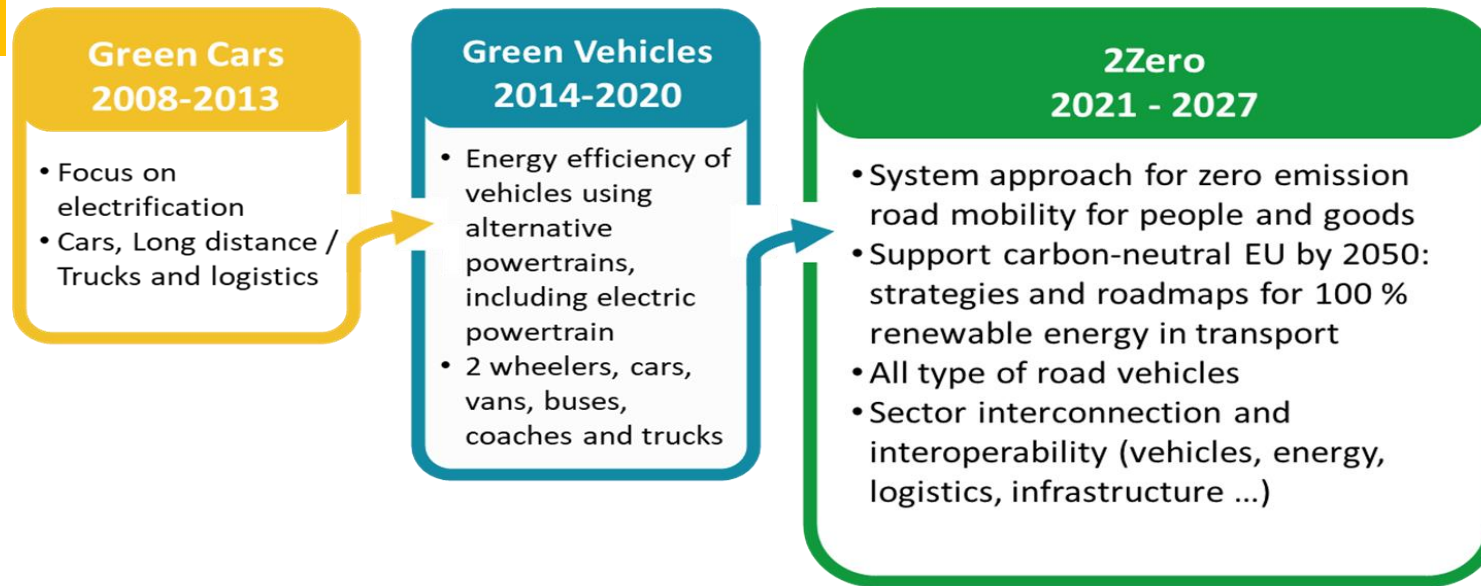
- **Normal workprogramme:** specific, cross sectorial topics e.g., for transport, pollution and health impact, safety etc.
- **Co-programmed partnerships:** between the Commission and private and/or public partners, e.g. 2Zero, BAtt4EU, CCAM
- **Co-funded partnerships:** involving public authorities with a Commission top-up, e.g.
- **Institutionalised partnerships:** based on long-term dimension and need for higher integration, can involve several Member States, bodies established through a Decision of the Council, e.g. Hydrogen and Fuel Cell JU
- **Missions:** umbrella tool that allows coordination of partnerships towards a common goal, e.g. Mission on climate neutral and smart cities

CLIMATE, ENERGY AND MOBILITY

“2Zero – Towards Zero Emission Road Transport”



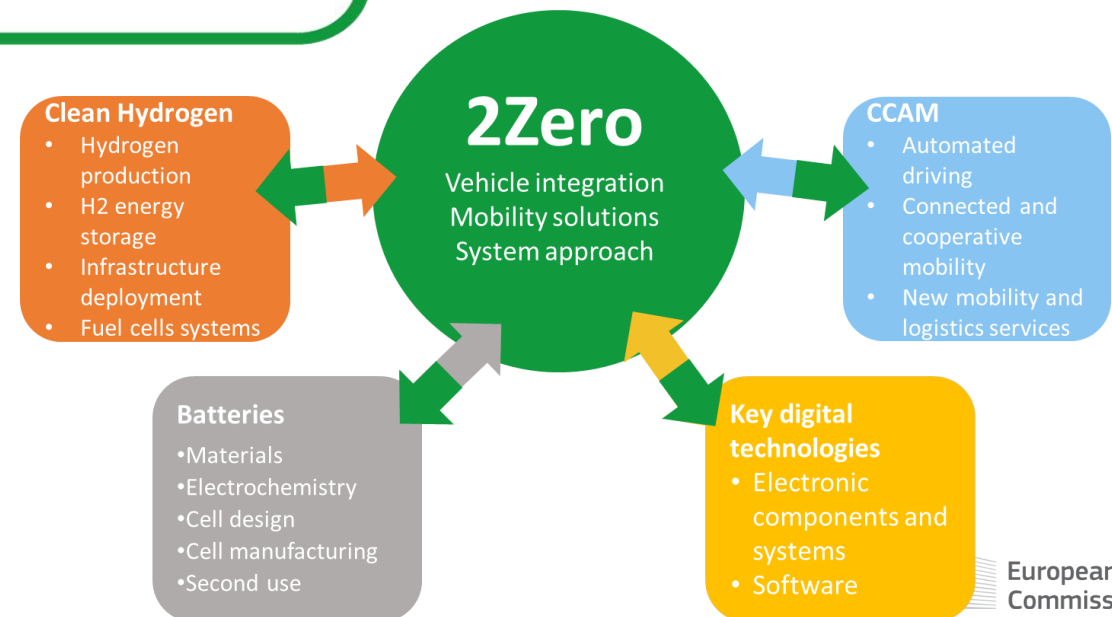
2Zero – Towards Zero Emission Road Transport



EGVI
European Green Vehicles Initiative



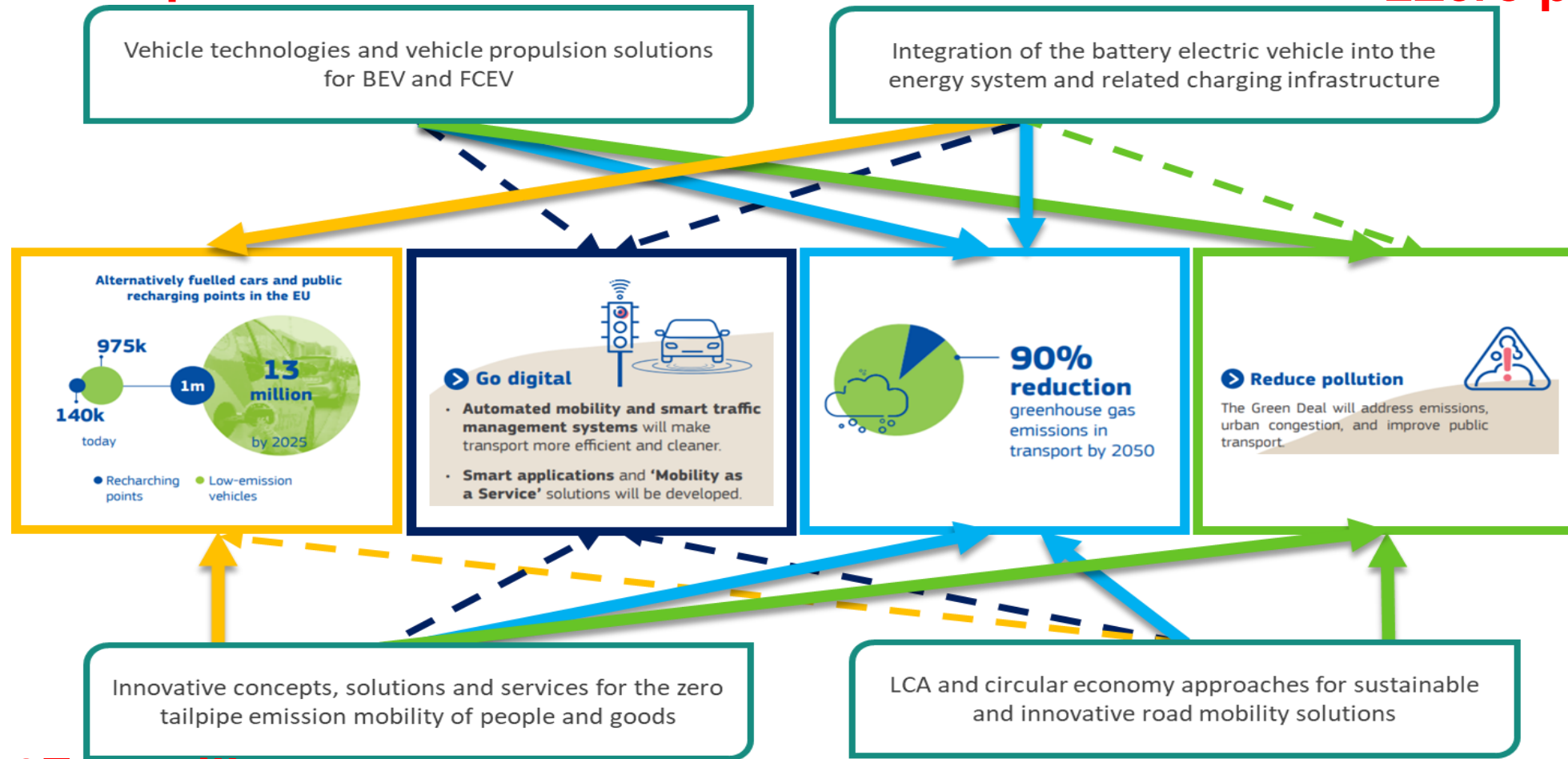
- **Main Objective:** 2Zero partnership shall accelerate the development and deployment of a zero tailpipe emission transport in Europe with a system approach.
- **Budget:** **615 M€** (EC contribution)



2Zero SRIA – system perspective with 4 pillars

2Zero pillar

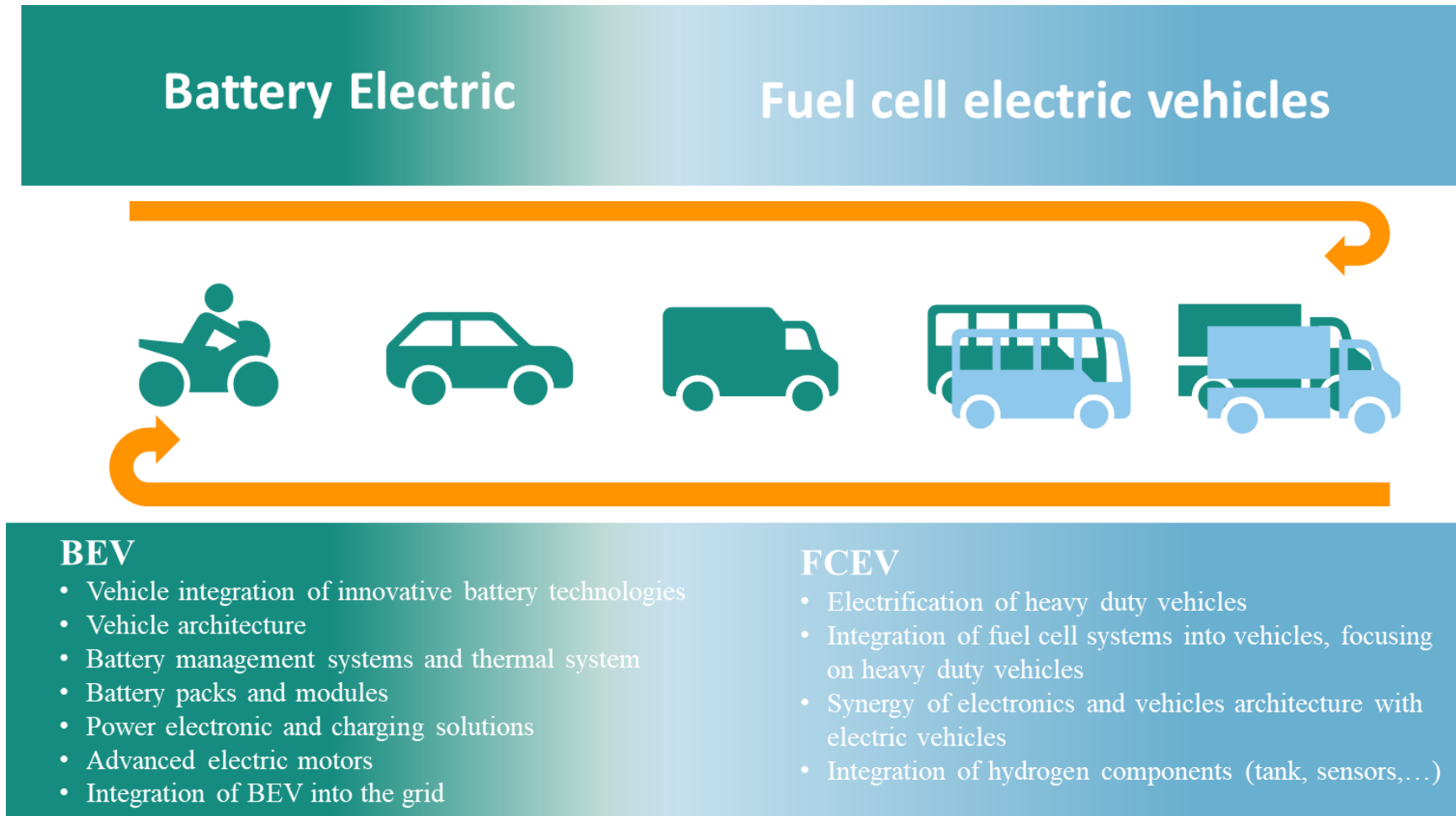
2Zero pillar



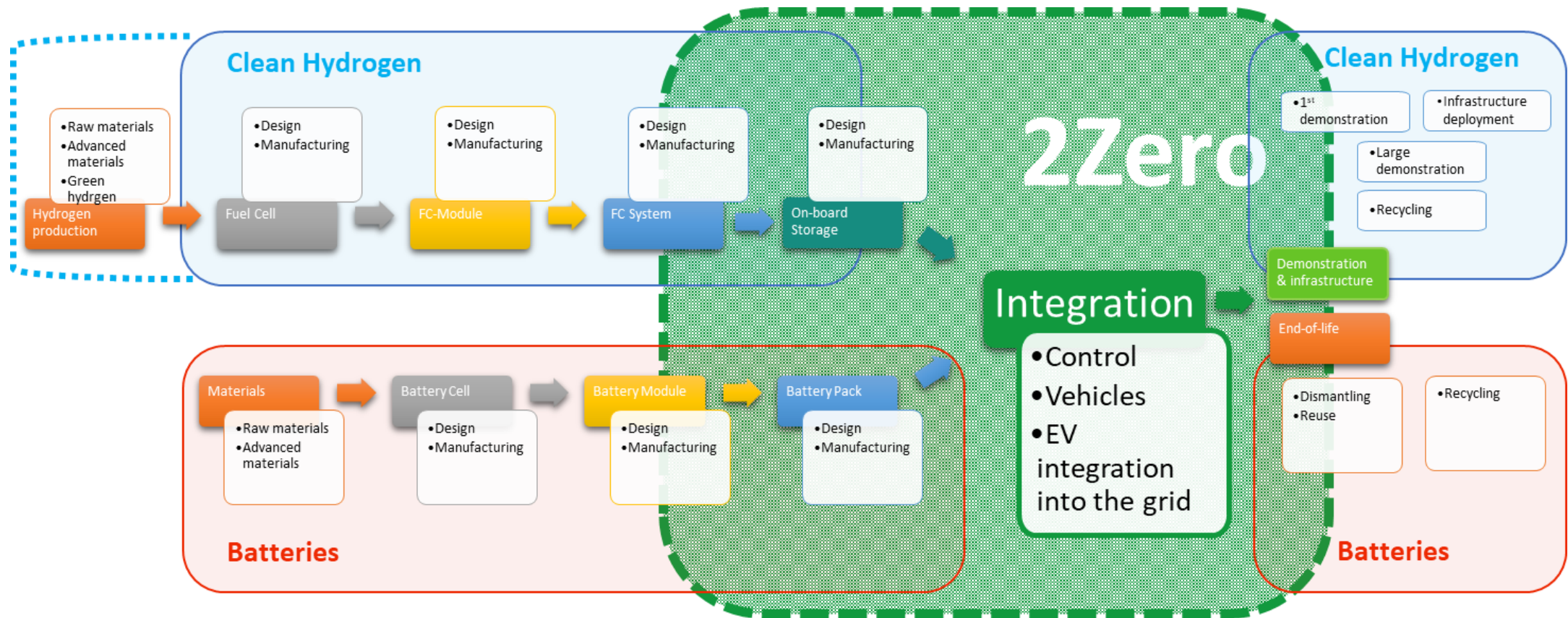
2Zero pillar

2Zero pillar

All zero tailpipe emissions road vehicles involved



Special links with 'Batt4EU' and 'Clean Hydrogen' partnerships



2Zero: calls WP 2021-2022

For 2Zero – 7 topics (budget € 197 mio)

- First call deadline: 14 September 2021
- Second call deadline: 26 April 2022

Main objective

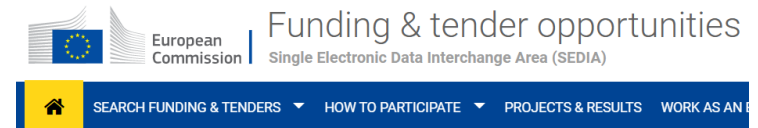
- Accelerate the development and deployment of a zero-emission transport in EU with a system approach

2Zero topics 2021-22

- **HORIZON-CL5-2021-D5-01-01 - Innovative zero emission BEV architectures for regional medium freight haulage**
- HORIZON-CL5-2021-D5-01-02 - Integration of advanced power electronics and associated controls
- **HORIZON-CL5-2021-D5-01-03 - System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment**
- HORIZON-CL5-2021-D5-01-04 - LCA and design for sustainable circularity (2ZERO & Batteries Partnership)
- **HORIZON-CL5-2022-D5-01-08 - Modular multi-powertrain zero-emission systems for HDV (BEV/FCEV) for efficient / economic operation**
- HORIZON-CL5-2022-D5-01-09 - High efficiency and low-cost electric motors for circularity and low use of rare resources
- **HORIZON-CL5-2022-D5-01-10 - New generation of full electric urban and peri-urban Bus Rapid Transit systems**

Call	Deadline	# of topics	Budget	Proposal submitted	Projects selected
2021	Sept 2022	4	€ 94 Mio	38	12
2022	April 2022	3	€ 103 Mio	24	8

For more information:
[EC funding & tenders portal](#)



2Zero: calls WP 2023-2024

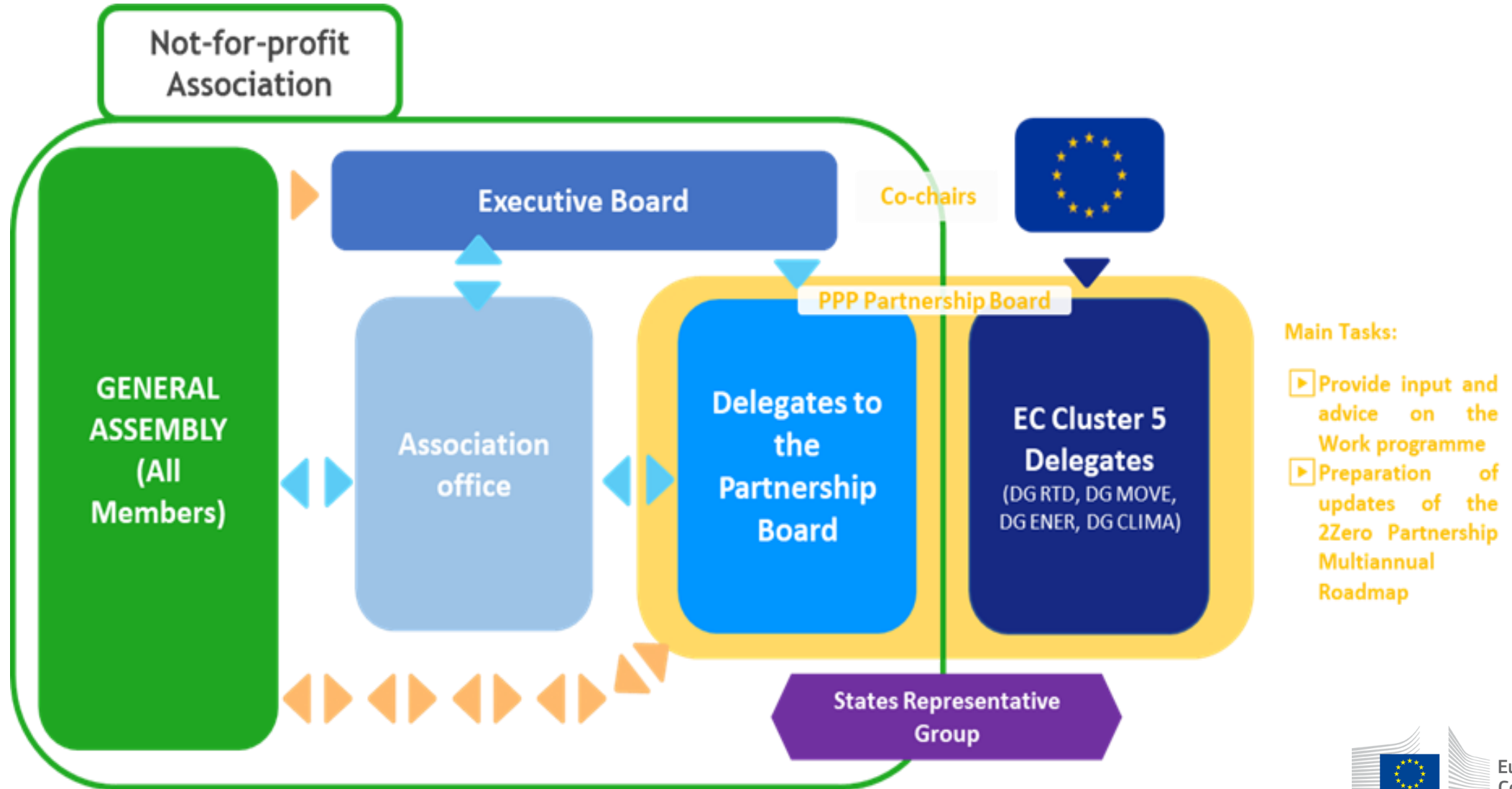
For more information:
[EC funding & tenders portal](#)

Topic title		Year	Budget
User-centric design and operation of EV for optimized energy efficiency	IA	2023	15.00
Innovative battery management systems for next generation vehicles (2ZERO & Batt4EU)	IA	2023	10.00
Frugal zero-emission vehicles concepts for the urban passenger challenge	IA	2023	20.00
Circular economy approaches for zero emission vehicles	RIA	2023	12.00
Measuring road transport results towards 2ZERO KPIs	CSA	2023	1.00
EU Member States/Associated countries research policy cooperation network to accelerate zero-emission road mobility	CSA	2023	1.50
Smart, low-cost pervasive stationary slow charging and bi-directional solutions synergic with the grid for EV mass deployment	IA	2024	15.00
Integration and testing of next generation post 1200V electric powertrains	RIA	2024	15.00
Advanced battery system integration for next generation vehicles	RIA	2024	10.00
Integrated flexible multipoint megawatt charging systems for electric truck mass deployment	IA	2024	17.00
Advanced digital development tools to accelerate the development of software defined vehicles that enable zero-emission mobility	RIA	2024	10.00
New designs, shapes, functionalities of Light Commercial Vehicles	IA	2024	10.00

Plus: **joint topic 2zero-CCAM-Cities' Mission:** *Co-designed smart systems and services for user-centred shared zero-emission mobility of people and goods in urban areas (under Mission WP)*



Partnership Governance: the 2Zero example



CLIMATE, ENERGY AND MOBILITY

“Batt4EU – Batteries for Europe”



The Batt4EU vision

Towards a competitive European industrial battery value chain for stationary applications and e-mobility



To establish by 2030 in Europe the best in the world innovation ecosystem for batteries

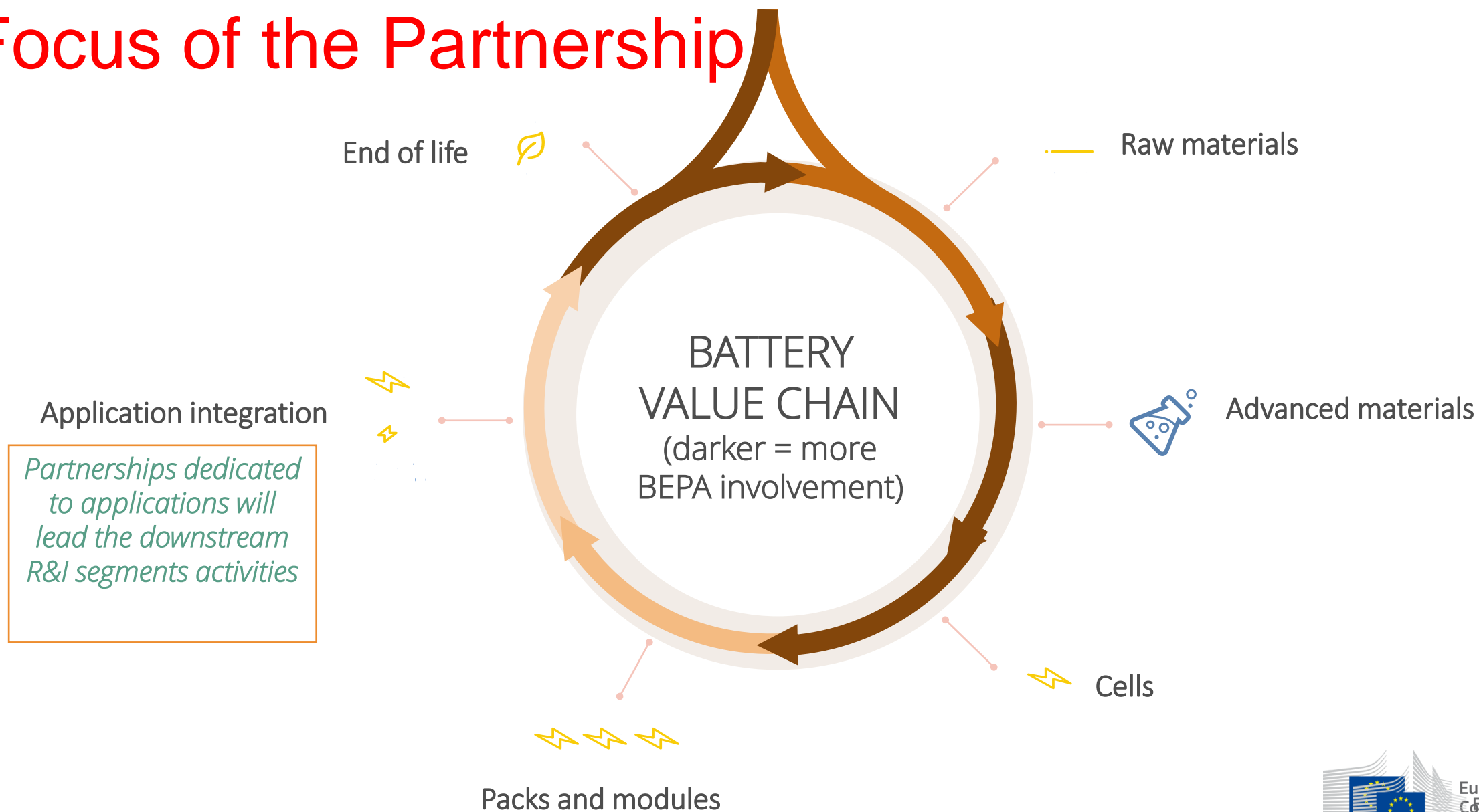


Which will boost a competitive, sustainable and circular European battery value chain



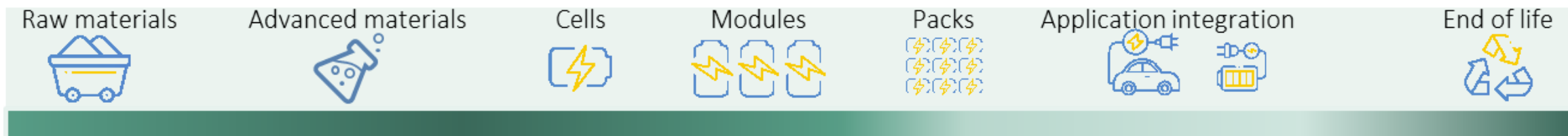
And will drive the transformation towards a carbon-neutral society

Focus of the Partnership



Scope of the Strategic R&I Agenda

3 focus areas to cover the segments of the value chain and 2 cross-cutting issues



www.bepassociation.eu/sria

2021 Batt4EU calls

Overview



7 topics: **€160 million** total budget



61 proposals submitted. Funding requested: **€ 430 million**



22 proposals awarded, granted amount: **€ 155 million**



Grant agreements to be signed in June 2022

+ joint projects with 2ZERO (road transport partnership) on LCA

Destination 2 – Batteries

2023-24 Topics

Technologies for sustainable, cost-efficient and low carbon footprint downstream processing & production of battery-grade materials

Advanced sustainable and safe pre-processing technologies for End-of-Life (EoL) battery recycling

Post-Li-ion technologies and relevant manufacturing techniques for mobility applications (Generation 5)

Non-Li Sustainable Batteries with European Supply Chains for Stationary Storage

Size & weight reduction of cell and packaging of batteries system, integrating lightweight and functional materials, innovative thermal management and safe by design approach

Accelerated multi-physical and virtual testing for battery aging, reliability and safety evaluation

Development of technical and business solutions to optimise the circularity, resilience, and sustainability of the European battery value chain

New processes for upcoming recycling feeds

Advanced materials and cells development enabling large-scale production of Gen4 solid-state batteries for mobility applications

Sustainable high-throughput production processes for stable lithium metal anodes for next generation batteries

Advanced digital twins for battery cell production lines

Battery management system (BMS) and battery system design for stationary energy storage systems (ESS) to improve interoperability and facilitate the integration of 2nd life batteries

Hybrid electric energy storage solutions for grid support and charging infrastructure

New Approaches to Develop Enhanced Safety Materials for Gen 3 Li-Ion Batteries for Mobility Applications

Creating a digital passport to track battery materials, optimize battery performance and life, validate recycling, and promote a new business model based on data sharing

CLIMATE, ENERGY AND MOBILITY

“CCAM – Cooperative, Connected, Automated Mobility”





European Partnership on



Ambition:

- Accelerate through research the deployment of innovative CCAM systems and services for passengers and goods, integrated in the road system as a whole and support new mobility concepts, shifting from a driver-centred to mobility-user oriented approach

European Partnership objectives:

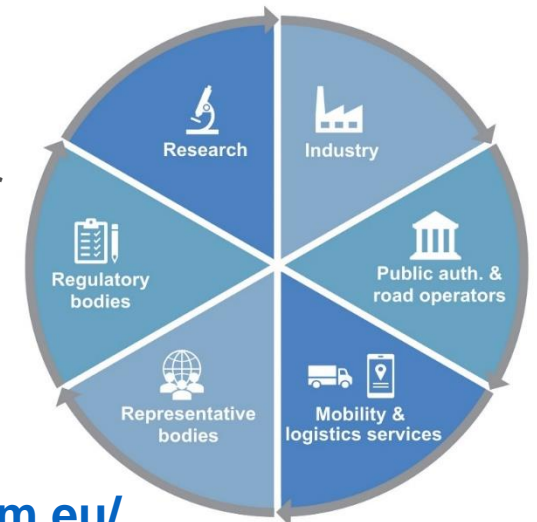
- Better align EU R&I efforts in the field of CCAM
- Develop and implement a coherent long-term agenda to coordinate investments in R&I and pre-deployment
- Implement large-scale demonstrations of inclusive and user-oriented CCAM solutions for people and goods across Europe by 2030.

Budget: 1 Billion € (500 M€ EC contribution)

State of play:

- Strategic Research and Innovation Agenda (SRIA) being updated;
- Projects resulting from first HE Calls started in 2022;
- WP23-24 published in December 2022

→ **214** member companies / organisations



<https://www.ccam.eu/>



Added value of CCAM partnership

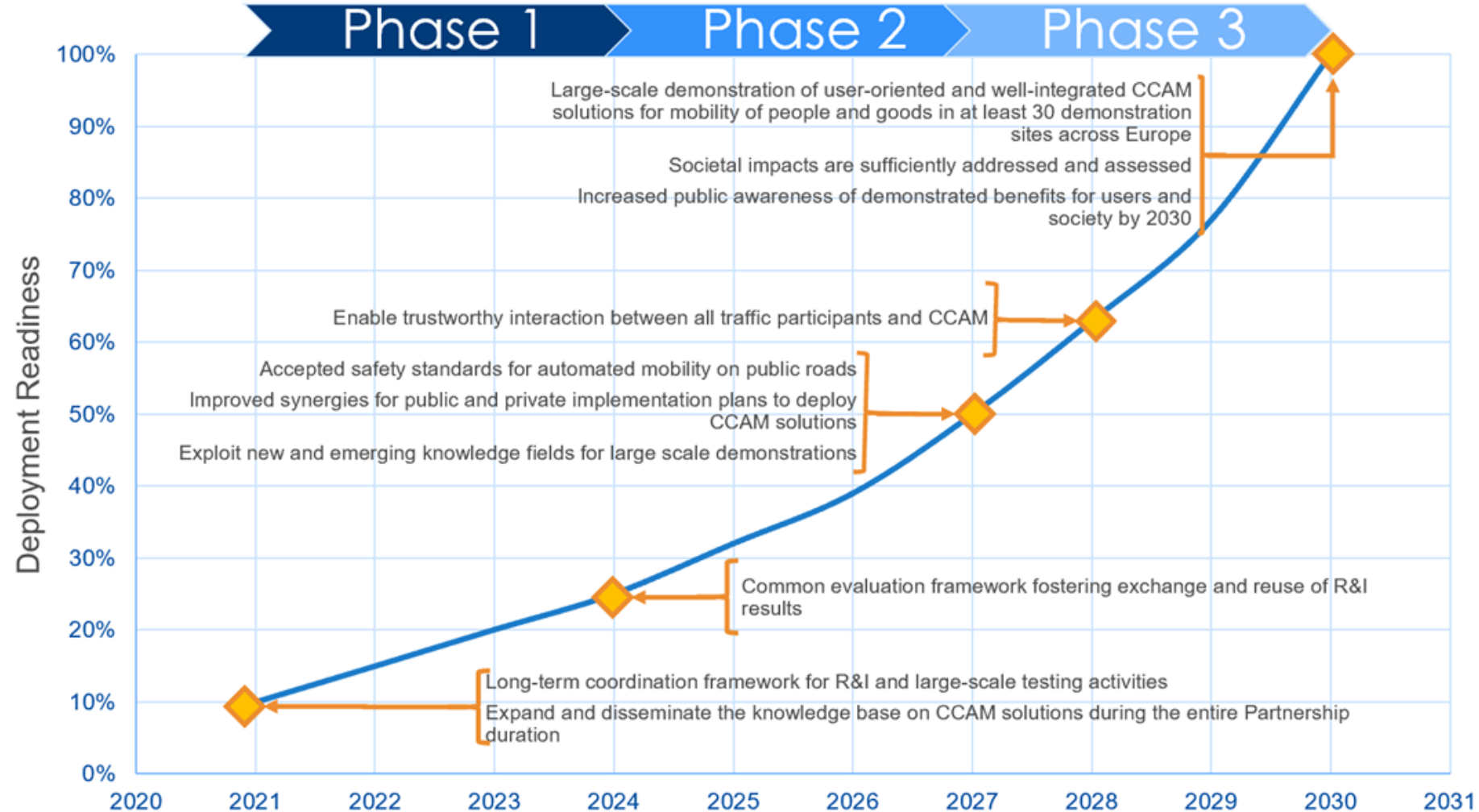


- Joint vision and roadmap agreed with all relevant stakeholders (SRIA)
- Strategic role of the State Representative Group
- More structured collaboration among members
- Better coordination among Projects (that feel part of a bigger picture)



Planning for CCAM implementation 2021-2030

- ❑ Phase 1 – Developing the building blocks
- ❑ Phase 2 – Advancing technical maturity
- ❑ Phase 3 – Trials and living labs all over Europe





Overview of CCAM demonstrators





Synergies



Joint research topic
smart systems and
services for user-centred
shared zero-emission
mobility of people and
freight in urban areas



- 50M€
- 2 large scale demos

WP2023-24 topics – destination 6 of Cluster 5

CCAM clusters	HE Cluster 5 Work Programme 2023/2024 - CCAM Topics	Year	Budget	# of projects
Large-scale demonstration	Joint topic in Cities' Mission WP: Co-designed smart systems and services for user-centred shared zero-emission mobility of people and freight in urban areas	2023	50	2
Vehicle Technologies	Centralized, reliable, cyber-secure & upgradable in-vehicle electronic control architectures for CCAM connected to the cloud-edge continuum	2024	12	2
	User-centric development of vehicle technologies & services to optimise the on-board experience and ensure inclusiveness	2023	8	2
Validation	Generation of scenarios for development, training, virtual testing and validation of CCAM systems	2023	20	1
	Scenario-based safety assurance of CCAM and related HMI in a dynamically evolving transport system	2024	14	1
Integrating the vehicle in the transport system	Infrastructure-enabled solutions for improving the continuity or extension of Operational Design Domains (ODDs)	2023	12	2
	Orchestration of heterogeneous actors in mixed traffic within the CCAM ecosystem	2024	12	2
Key Enabling technologies	AI for advanced and collective perception and decision making for CCAM applications	2024	10	2
Societal aspects & user needs	Integrating European diversity in design, development and implementation of CCAM solutions to support mobility equity	2023	8	2
	CCAM effects on jobs and education, plans for skills that match the CCAM development, and prerequisites for employment growth	2023	2	1
Coordination	Robust Knowledge and Know-How transfer for Key-Deployment Pathways and implementation of the EU-CEM	2024	4	1

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-8-climate-energy-and-mobility_horizon-2023-2024_en.pdf

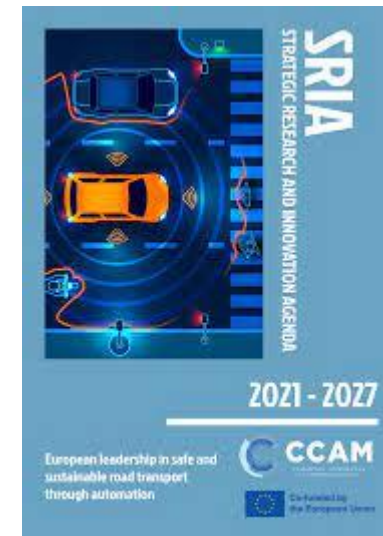
- Joint topic: opening 10 January 2023; deadline: 27 April 2023;
- CCAM Topics: opening 04 May 2023; deadline: 05 Sep 2023;

European R&I (Road) Transport Events in 2023



Revision of partnerships' SRIAs

- “Strategic Research and Innovation Agenda (SRIA)”**: reference document** for implementing Horizon Europe partnerships
- **Mid-term** of the Horizon Europe (2023): need to **revise the SRIAs**, process for all co-programmed partnerships
- Strategic vision of “**where we want to be**” in the future
- **Co-drafted** by all interested stakeholders representing the whole value chain and sectors involved in the partnership
 - ✓ Take into account all **novelties / EU strategies** developed
 - ✓ Involve **more actors** in this process
 - ✓ Revisit (where needed) the **R&I needs and priorities**
 - ✓ Help us **shape our next 3 years of the WP**
 - ✓ **Affordability** is key!



Thank you for your attention

Meet us at upcoming Events

Cluster 5 Info Day – October 2023



European Conference – **Results from Road Transport**

Research in H2020 projects

(RTR conference) – February 2024



Transport Research Arena (TRA) 2024

– Dublin – 15-18 April 2024

