

APRE

Agenzia per la Promozione
della Ricerca Europea

Session 3: Focus on Pillar II: Climate, energy and mobility (Cluster 5)

Destination 5 & Destination 6

02/06/2021

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APRE

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Rules for Participation

Source: Regulation establishing Horizon Europe

Entities eligible for participation



Art. 18: «Any legal entity, regardless of its place of establishment, including legal entities from non associated third countries or international organisation may participate in actions under the Programme, provided that the conditions laid down in this Regulation have been met together with any conditions laid down in the work programme or call»

Entities eligible for funding

EU COUNTRIES

- Member States (MS) including their outermost regions
- The Overseas Countries and Territories (OCTs) linked to the MS.

NON-EU COUNTRIES

- Countries associated to Horizon Europe (AC)
- Low and middle income countries: See [HE Programme Guide](#).
- Other countries when announced in the call or exceptionally if their participation is essential

SPECIFIC CASES

- Affiliated entities established in countries eligible for funding.
- EU bodies
- International organisations (IO):
 - International European research organisations are eligible for funding.
 - Other IO are not eligible (only exceptionally if participation is essential)
 - IO in a MS or AC are eligible for funding for Training and mobility actions and when announced in the call conditions

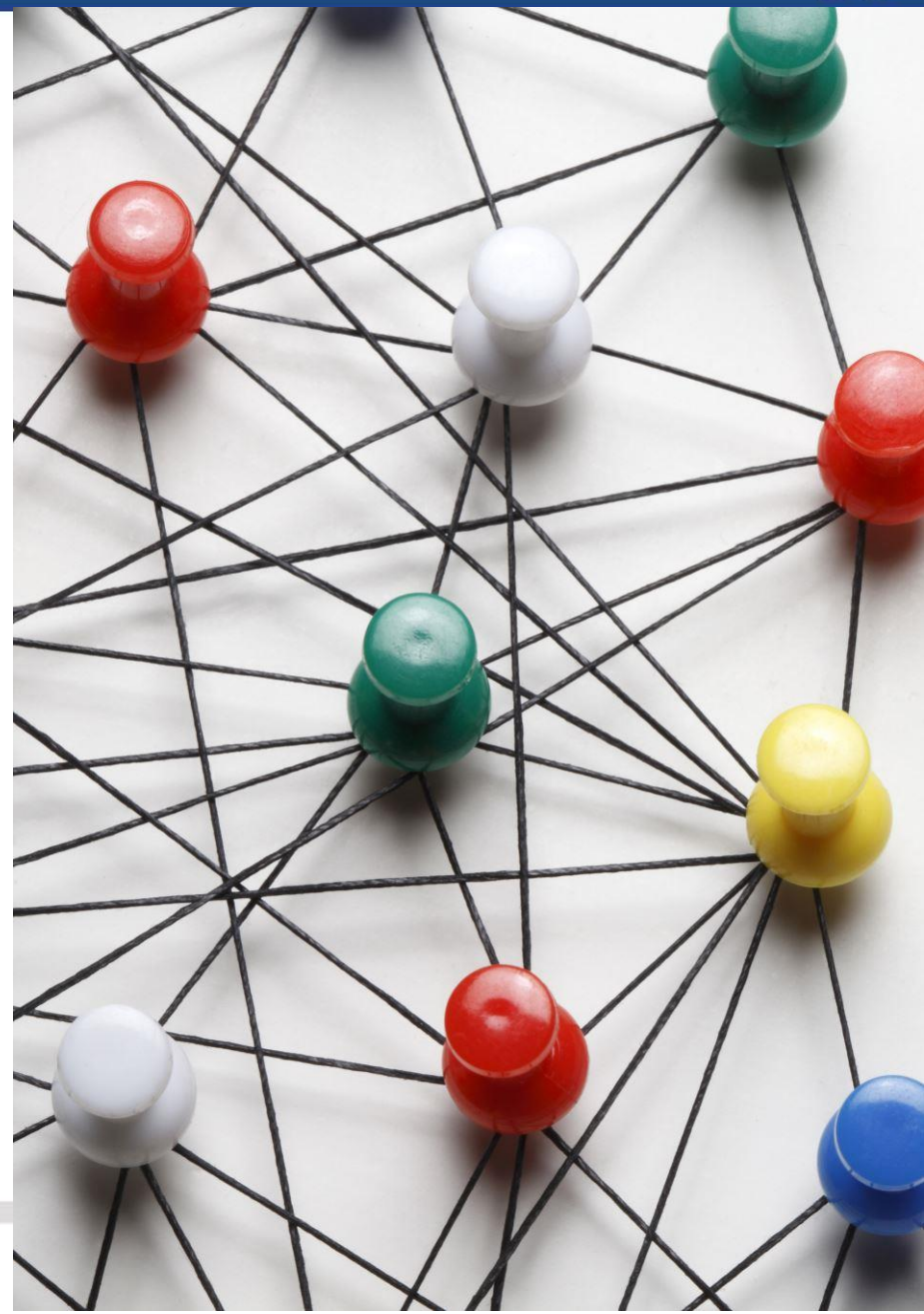


Minimum requirements

- Art. 18: «Entities shall be part of a consortium that shall include at least three independent legal entities each established in a different Member State or associated country and with at least one of them established in a Member State, unless:
(a) the work programme provides otherwise, if duly justified”

SPECIAL/ADDITIONAL CONDITIONS

MAY BE OUTLINED IN THE WORK PROGRAMME (No of participants, type of participants)



Eligible activities (Main types of action)

RESEARCH AND INNOVATION ACTION (RIA)

Activities aiming primarily to establish new knowledge or to explore the feasibility of a new or improved technology, product, process, service or solution.

This may include basic and applied research, technology development and integration, testing, demonstration and validation on a small-scale prototype in a laboratory or simulated environment.

Funding rate: 100% of eligible costs

INNOVATION ACTION (IA)

Activities directly aimed at producing plans and arrangements or designs for new, altered or improved products, processes or services, possibly including prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.

Funding rate: 70% (except for non-profit legal entities, where the funding rate is up to 100%) of the total eligible costs

COORDINATION AND SUPPORT ACTION (CSA)

Activities contributing to the objectives of the Horizon Europe Programme, excluding R&I activities (e.g. networking, awareness raising, coordination, stakeholder engagement)

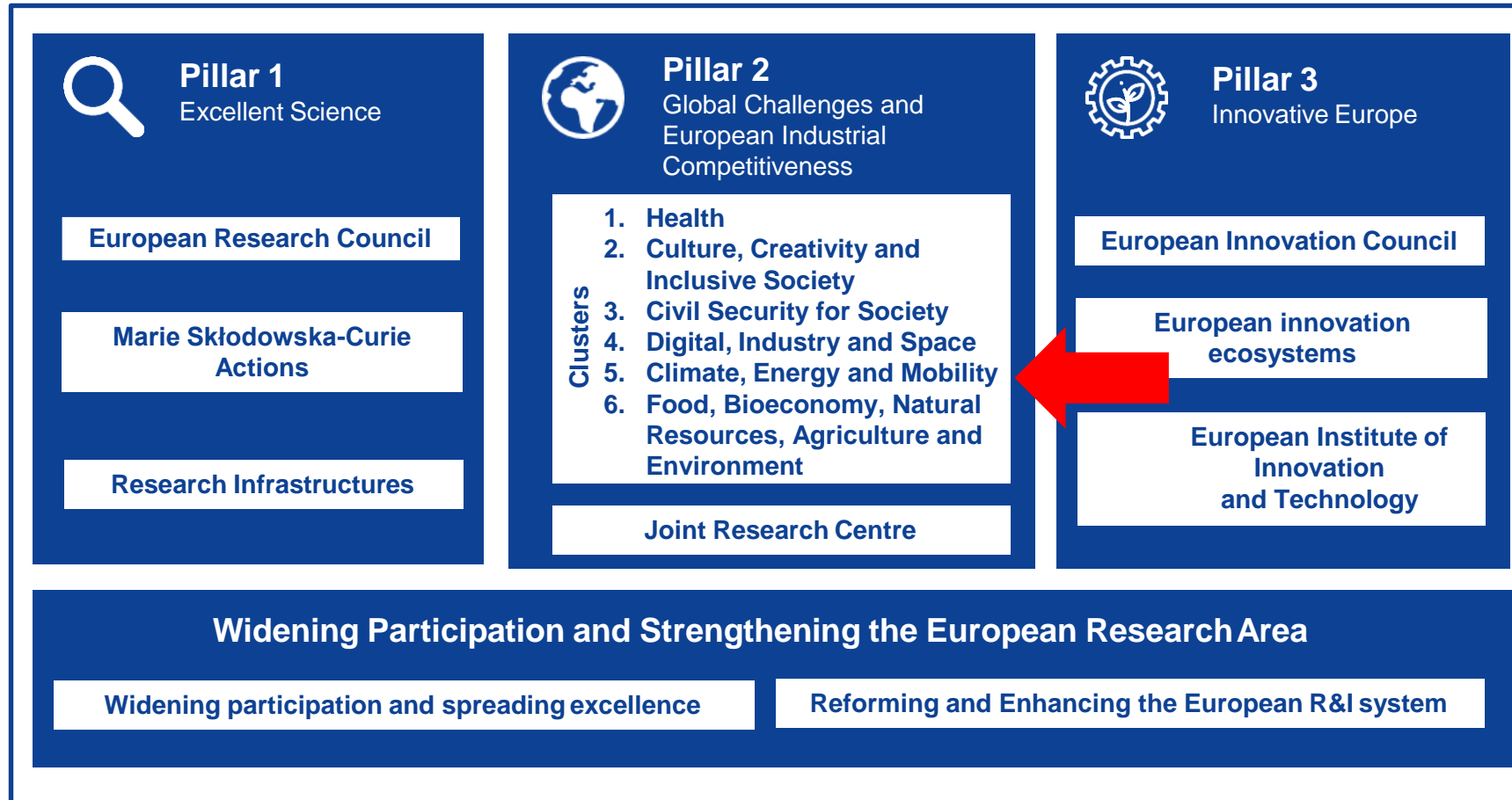
Funding rate: 100% of the total eligible costs



Cluster 5

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Horizon Europe: structure



CL5: Climate, energy and mobility

- aims to fight climate change by better understanding its causes, evolution, risks, impacts and opportunities, and by making the energy and transport sectors climate neutral, environment-friendly, efficient, competitive, smarter, safer, resilient and useful for citizens and society.
- Cluster 5 supports the EU's strategic objectives through activities included in its work programme and through the support of Institutional European Partnerships which are implemented through dedicated structures.
- R&I activities under CL5 will contribute to the objectives of the European Green Deal related to the Climate Pact, the Clean energy strategy, the Strategic Energy Technology (SET) Plan, the Strategic Transport Research and Innovation Agenda (STRIA), European Circular Economy Action Plan

Intervention Areas
Climate sciences and solutions
Energy systems and grids
Energy supply
Buildings and industrial facilities in energy transitions
Energy storage
Communities and cities
Smart mobility
Clean, safe and accessible transport and mobility

Transition to a climate-neutral society and economy enabled through **climate science, pathways and responses to climate change and behavioural transformations.**



Climate sciences and responses for the transformation towards climate neutrality

Transition of the energy and transport sectors towards climate neutrality facilitated by **innovative crosscutting solutions.**



Cross-sectoral solutions for the climate transition

More efficient, clean, sustainable, secure and competitive energy supply through **new solutions for smart grids and energy systems based on more performant renewable energy solutions.**



Sustainable, secure and competitive energy supply

Efficient and sustainable **use of energy**, accessible for all is ensured through a clean energy system and a just transition.



Efficient, sustainable and inclusive energy use

Towards climate-neutral mobility through **clean solutions across all transport modes** while increasing global competitiveness of the EU transport sector.



Clean and competitive solutions for all transport modes

Safe, seamless, smart, inclusive, resilient, climate neutral and sustainable **mobility systems for people and goods** thanks to user-centric technologies and services including digital technologies and advanced satellite navigation services.



Safe, Resilient Transport and Smart Mobility services for passengers and goods

All actions funded under CL5 destinations must help to deliver the respective main impacts.

CL5 Work Programme 2021-2022 - budget distribution per destination

Destination	Number of topics	Budget mln EUR]	% Share
D1 Climate sciences and responses for the transformation towards climate neutrality	17	274	9%
D2 Cross-sectoral solutions for the climate transition	27	388,5	13%
D3 Sustainable, secure and competitive energy supply	67	1.226,3	40%
D4 Efficient, sustainable and inclusive energy use	18	244	8%
D5 Clean and competitive solutions for all transport modes	31	511	17%
D6 Safe, Resilient Transport and Smart Mobility services for passengers and goods	28	380	12%
Other actions	35	44,97	2%
Total	223	3077,39	100%



Cluster 5 WP calls structure

DESTINATION	Call ID 2021 one stage	Call ID 2022 one stage	Call ID 2022 two stage
D1 Climate sciences and responses for the transformation towards climate neutrality	HORIZON-CL5-2021-D1-01	HORIZON-CL5-2022-D1-02	HORIZON-CL5-2022-D1-01-two-stage
D2 Cross-sectoral solutions for the climate transition	HORIZON-CL5-2021-D2-01		HORIZON-CL5-2022-D2-01
D3 Sustainable, secure and competitive energy supply	HORIZON-CL5-2021-D3-01 HORIZON-CL5-2021-D3-02	HORIZON-CL5-2022-D3-01 HORIZON-CL5-2022-D3-02 HORIZON-CL5-2022-D3-03	
D4 Efficient, sustainable and inclusive energy use	HORIZON-CL5-2021-D4-01 HORIZON-CL5-2021-D4-02	HORIZON-CL5-2022-D4-01 HORIZON-CL5-2022-D4-02	
D5 Clean and competitive solutions for all transport modes	HORIZON-CL5-2021-D5-01	HORIZON-CL5-2022-D5-01	
D6 Safe, Resilient Transport and Smart Mobility services for passengers and goods	HORIZON-CL5-2021-D6-01	HORIZON-CL5-2022-D6-01 HORIZON-CL5-2022-D6-02	



Destination 5

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Destination 5: Clean and competitive solutions for all transport modes 1/4

Includes topics from **Co-programmed Partnership** “**Towards zero emission road transport**” (2Zero) with focus on:

- user-centric solutions (technologies and services) for road-based mobility.
- Increased user acceptance, improved air quality.
- charging infrastructure concepts and technologies that include vehicle-grid-interactions.
- Innovative use cases for the integration of zero tailpipe emission vehicles, and infrastructure concepts for the road mobility of people and goods.
- Effective design, assessment and deployment of innovative concepts in road vehicles and mobility services thanks to life-cycle analysis tools and skills.





Topics 2021 – 2ZERO

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D5-01-01	Nextgen vehicles	2ZERO	IA	14/09/2021	10.00 to 15.00	TRL7-8
HORIZON-CL5-2021-D5-01-02	Nextgen EV components	2ZERO	RIA	14/09/2021	4.00 to 6.00	TRL5-6
HORIZON-CL5-2021-D5-01-03	System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions (2ZERO)	2ZERO	RIA	14/09/2021	7.00 to 10.00	TRL5-7
HORIZON-CL5-2021-D5-01-04	LCA and design for sustainable circularity - holistic approach for zero-emission mobility solutions and related battery value chain (2ZERO & Batteries Partnership)	2ZERO	CSA	14/09/2021	Around 4.00	

Destination 5: Clean and competitive solutions for all transport modes

2/4

Includes topics on **collaborative aviation R&I focusing on transformative low-TRL (1-4) technologies**, notably precompetitive fundamental aviation research and technologies for future development, validation and integration activities:

- Technologies based on new energy carriers, hybrid-electric architectures, next generation of ultra-high efficient engines and new aircraft configurations
- New technologies for significantly lower local air-pollution and noise.
- passenger protection and general resilience of the aviation ecosystem to external shocks (e.g. health issues, manufacturing, operations, cybersecurity).

- Development, integration and validation of climate-neutral aviation **technologies (TRL 4-6)**, for earliest possible deployment, and all propulsion technologies for integration at engine level fall under the **Institutionalised Partnership Clean Aviation** [not included in CL5 WP].
- Air Traffic Management fall under the **Institutionalised Partnership for Integrated Air Traffic Management** [not included in CL5 WP].



Topics 2021 – Aviation

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D5-01-05	Greenhouse gas aviation emissions reduction technologies towards climate neutrality by 2050	Aviation	RIA	14/09/2021	2.00 to 6.00	TRL4
HORIZON-CL5-2021-D5-01-06	Next generation digital aircraft transformation in design, manufacturing, integration and maintenance	Aviation	RIA	14/09/2021	3.00 to 6.00	TRL4

Destination 5: Clean and competitive solutions for all transport modes 3/4



- 7 Includes topics from the co-programmed Partnership **‘Zero Emission Waterborne Transport’** with focus on:
- deployment of climate neutral fuels and significant electrification of shipping.
 - energy efficiency and lower fuel consumption of vessels.
 - innovative port infrastructure (bunkering of alternative fuels and provision of electrical power)
 - clean inland waterway vessels.
 - integration of maritime and inland shipping into logistic chains, facilitated by full digitalisation and automation.
 - fully automated shipping (maritime and inland) and efficient connectivity.



Topics 2021 – Zero Emission Waterborne Transport

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D5-01-07	Enabling the safe and efficient on-board storage and integration within ships of large quantities of ammonia and hydrogen fuels	Waterborne transport	IA	14/09/2021	Around 10.00	TRL6-7
HORIZON-CL5-2021-D5-01-08	Enabling the full integration of very high power fuel cells in ship design using co-generation and combined cycle solutions for increased efficiency with multiple fuels	Waterborne transport	RIA	14/09/2021	Around 15.00	TRL5
HORIZON-CL5-2021-D5-01-09	CSA identifying waterborne sustainable fuel deployment scenarios	Waterborne transport	CSA	14/09/2021	Around 0.50	
HORIZON-CL5-2021-D5-01-10	Innovative on-board energy saving solutions	Waterborne transport	RIA	14/09/2021	Around 5.00	TRL5
HORIZON-CL5-2021-D5-01-11	Hyper powered vessel battery charging system	Waterborne transport	IA	14/09/2021	Around 7.00	TRL6-7
HORIZON-CL5-2021-D5-01-12	Assessing and preventing methane slip from LNG engines in all conditions within both existing and new vessels	Waterborne transport	IA	14/09/2021	Around 7.00	TRL7
HORIZON-CL5-2021-D5-01-13	Digital Twin models to enable green ship operations	Waterborne transport	RIA	14/09/2021	Around 7.00	TRL5
HORIZON-CL5-2021-D5-01-14	Proving the feasibility of a large clean ammonia marine engine	Waterborne transport	IA	14/09/2021	Around 10.00	TRL6-7

Destination 5: Clean and competitive solutions for all transport modes 4/4



7 Includes topics on **Impact of transport on environment and human health** targeting:

- reduction of road vehicle polluting emissions from both existing and future automotive fleets; prevention of smog episodes and a better understanding of the impact of air and noise pollution on human health (including potential sex and gender differences) .
- monitoring of the environmental performance and enforcement of regulation (detection of defeat devices, tampered anti-pollution systems, etc.) of fleets of transport vehicles, be it on road, airports and ports.
- reduction of noise emitted by L category road vehicles.
- Reduction of the overall environmental impact of transport (e.g.: as regards biodiversity, noise, pollution and waste)

Topics 2021 – Transport - health and environment

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D5-01-15	Development and demonstration of cost affordable and adaptable retrofit solutions for tailpipe and brake polluting emissions	Transport - health and environment	IA	14/09/2021	4.00 to 5.00	TRL8
HORIZON-CL5-2021-D5-01-16	Assessment of noise and particle emissions of L category vehicles from real driving conditions	Transport - health and environment	RIA	14/09/2021	4.00 to 5.00	TRL5-6

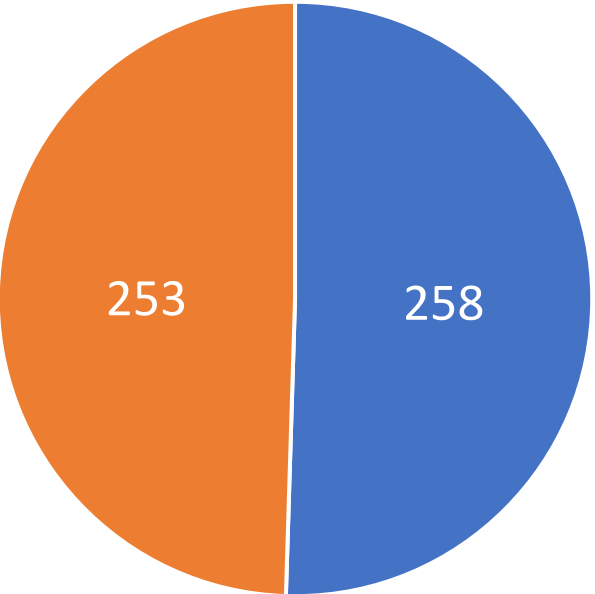


Topics 2021 – Cross-cutting

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETE D TRLS
HORIZON-CL5-2021-D5-01-17	Support for dissemination events in the field of Transport Research	Transport - cross- cutting	CSA	14/09/2021	Around 1.50	

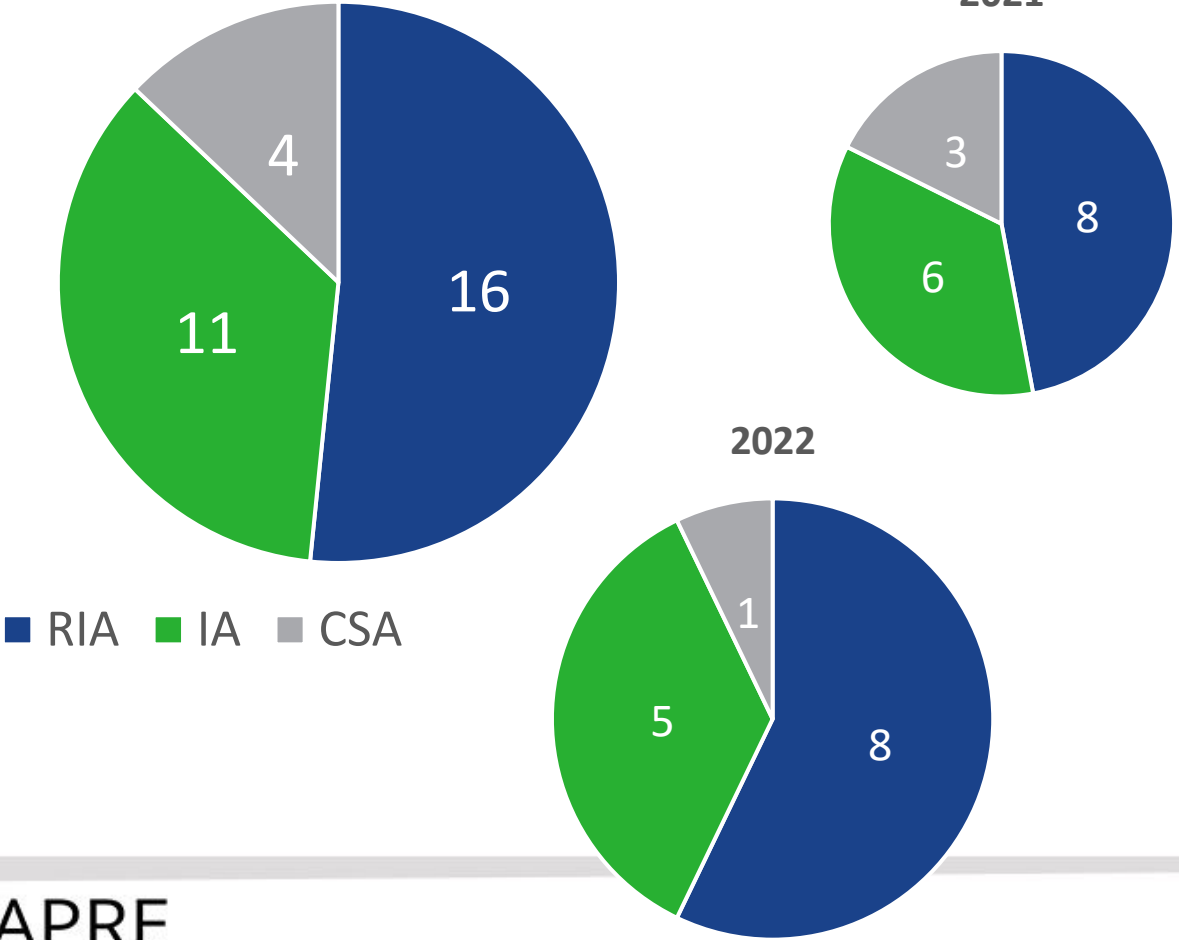
Destination 5: Clean and competitive solutions for all transport modes

Destination 5 - budget mil €



■ 2021 HORIZON-CL5-2021-D5-01
■ 2022 HORIZON-CL5-2022-D5-01

Destination 5 - types of action





Destination 6

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Destination 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods 1/3

Includes topics from the co-programmed Partnership **‘Connected, Cooperative and Automated Mobility’ (CCAM)** with focus on:

- Validated safety and security, improved robustness and resilience of CCAM technologies and systems.
- interaction between road users, CCAM and “conventional” vehicles, infrastructure and services.
- Seamless, affordable and user oriented CCAM based mobility and goods.
- Better coordination of R&I and large-scale testing activities in Europe.
- The focus is on road transport, but relevant interfaces with other modes (for instance transfers and integration with public transport or rail freight transport) will be considered.





Topics 2021 – CCAM

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D6-01-01	More powerful and reliable on-board perception and decision-making technologies addressing complex environmental conditions	CCAM	IA	19/10/2021	6.00 to 8.00	TRL6-7
HORIZON-CL5-2021-D6-01-02	Common approaches for the safety validation of CCAM systems	CCAM	RIA	19/10/2021	12.00 to 15.00	TRL5
HORIZON-CL5-2021-D6-01-03	Physical and Digital Infrastructure (PDI), connectivity and cooperation enabling and supporting CCAM	CCAM	IA	19/10/2021	7.00 to 9.00	TRL6-7
HORIZON-CL5-2021-D6-01-04	Cyber secure and resilient CCAM	CCAM	RIA	19/10/2021	5.00 to 6.00	TRL5
HORIZON-CL5-2021-D6-01-05	Analysis of socio-economic and environmental impacts and assessment of societal, citizen and user aspects for needs based CCAM solutions	CCAM	RIA	19/10/2021	3.00 to 4.00	
HORIZON-CL5-2021-D6-01-06	Framework for better coordination of large-scale demonstration pilots in Europe and EU-wide knowledge base	CCAM	RIA	19/10/2021	5.00 to 6.00	

Destination 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods 2/3

Includes topics on **Multimodal and sustainable transport systems for passengers and goods** targeting:

- physical and digital infrastructure.
- long-haul, regional and urban freight transport and logistics.
- Reduced external costs (e.g. congestion, traffic jams, emissions, air and noise pollution, road collisions) of urban, peri-urban (regional) and long distance freight transport as well as optimised system-wide network efficiency and resilience.
- local and/or regional capacity for governance and innovation in urban mobility and logistics.





Topics 2021 – Multimodal transport, logistics, infrastructure

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D6-01-07	More efficient and effective multimodal freight transport nodes to increase flexibility, service visibility and reduce the average cost of freight transport	Multimodal transport, logistics, infrastructure	IA	19/10/2021	7.00 to 8.00	TRL7-8
HORIZON-CL5-2021-D6-01-08	New delivery methods and business/operating models to green the last mile and optimise road transport	Multimodal transport, logistics, infrastructure	IA	19/10/2021	7.00 to 8.00	
HORIZON-CL5-2021-D6-01-09	Climate resilient and environmentally sustainable transport infrastructure, with a focus on inland waterways	Multimodal transport, logistics, infrastructure	IA	19/10/2021	Around 7.50	TRL7

Destination 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods 3/3



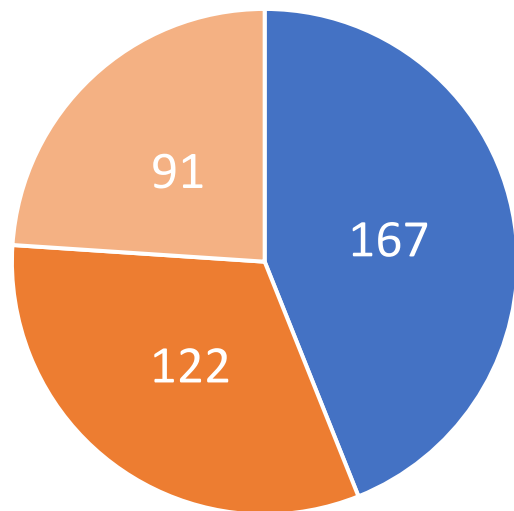
- Includes topics on **Safety and resilience - per mode and across all transport modes** targeting:
 - Safety in Urban Areas/ Road Transport Safety
 - Waterborne Safety and Resilience
 - Aviation Safety and Resilience
- Approaches are requested that consider technologies, regulations and human factors (individual and organisational aspects, including interaction with automation).

Topics 2021 – Multimodal transport, logistics, infrastructure

TOPIC CODE	TOPIC TITLE	AREA	TOA	DEADLINE - TBC	BUDGET PER GRANT Mil €	TARGETED TRLS
HORIZON-CL5-2021-D6-01-10	Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic system	Safety and resilience	RIA	19/10/2021	3.50 to 4.00	TRL5-6
HORIZON-CL5-2021-D6-01-11	Radical improvement of road safety in low and medium income countries in Africa	Safety and resilience	RIA	19/10/2021	Around 4.00	TRL5-6
HORIZON-CL5-2021-D6-01-12	Controlling infection on large passenger ships	Safety and resilience	RIA	19/10/2021	3.00 to 5.00	TRL5
HORIZON-CL5-2021-D6-01-13	Safe automation and human factors in aviation – intelligent integration and assistance	Safety and resilience	IA	19/10/2021	4.00 to 8.00	TRL6

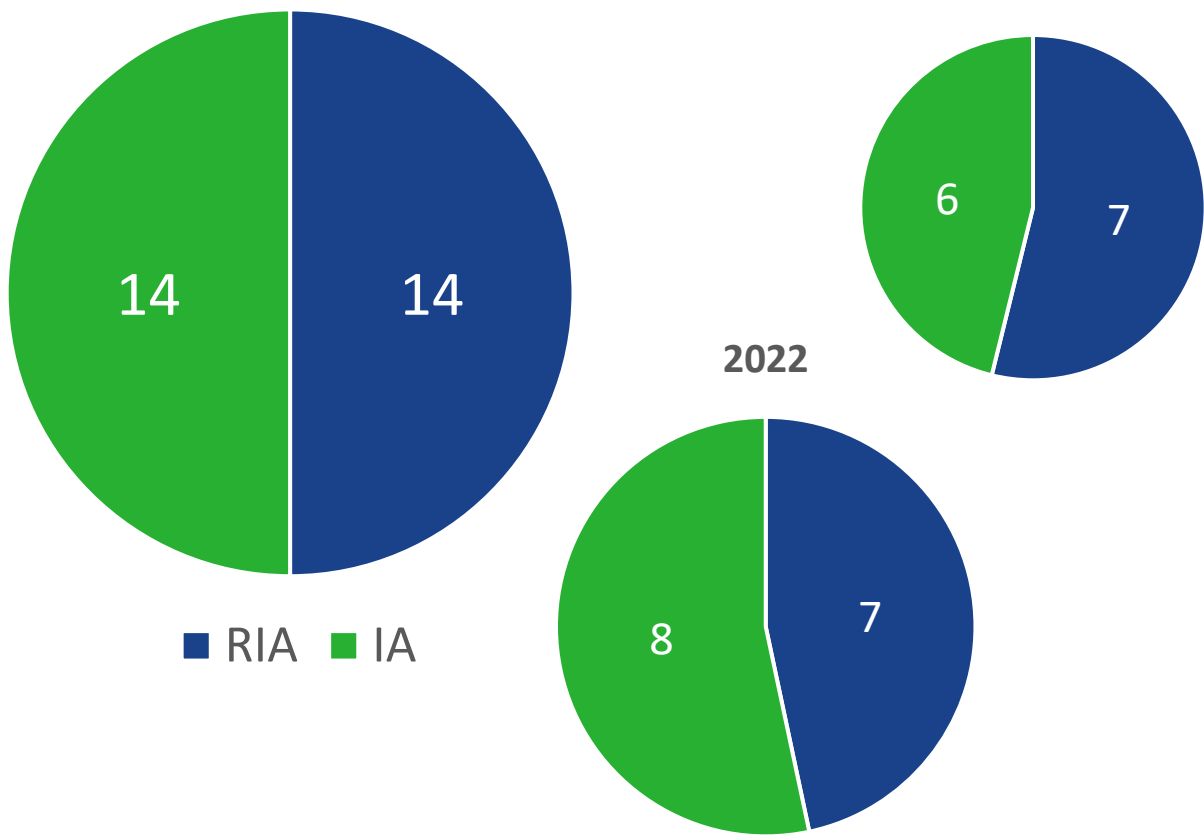
Destination 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods

Destination 6 - budget mil €



■ 2021 HORIZON-CL5-2021-D6-01
 ■ 2022 HORIZON-CL5-2022-D6-01
 ■ 2022 HORIZON-CL5-2022-D6-02

Destination 6 - types of action



■ RIA
 ■ IA



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