



APRE

Agenzia per la Promozione
della Ricerca Europea

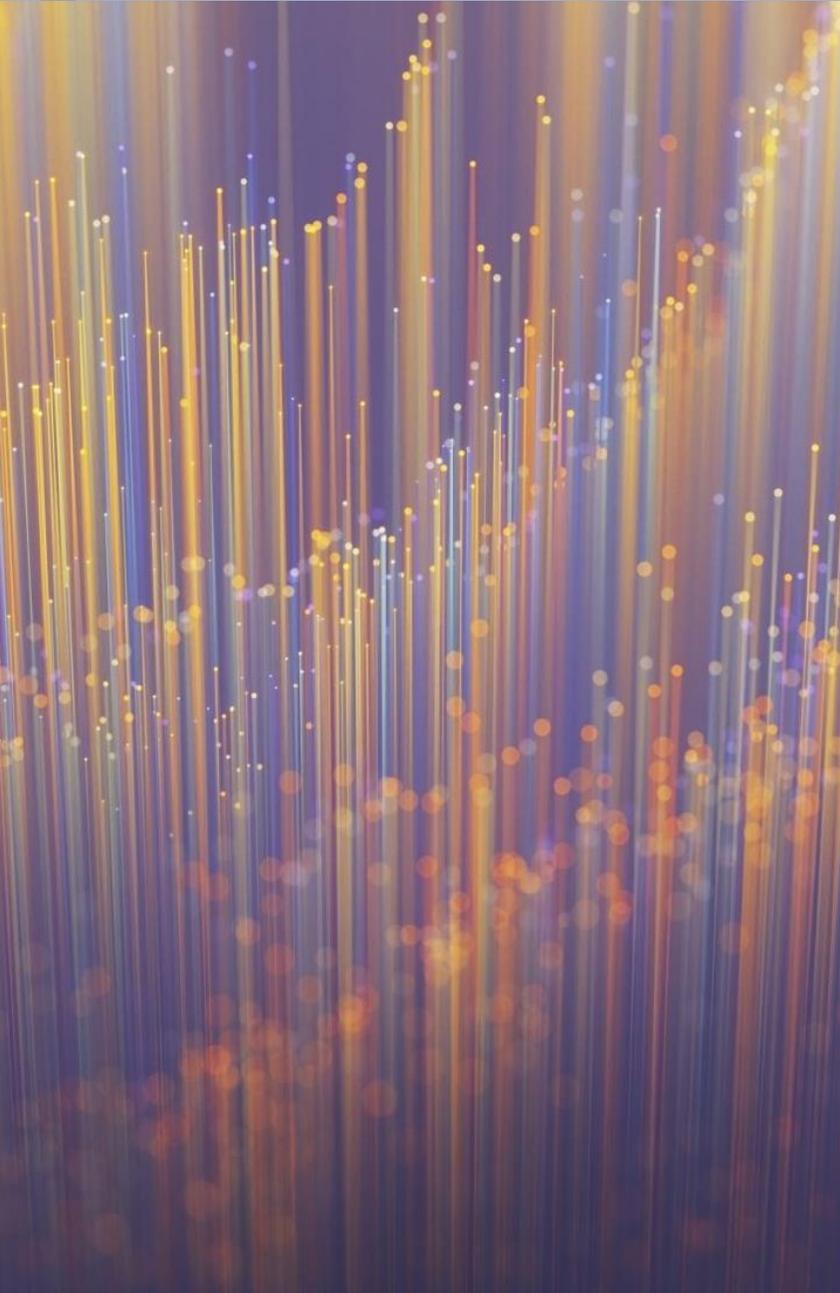
Session 3: Focus on Pillar II: Climate, energy and mobility (Cluster 5)

Destination 5 & Destination 6

02/06/2021

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APRE



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- National Contact Point for Cluster 5 «Climate, energy and mobility» - Horizon Europe
- National Contact Point for Societal Challenge 4 «Smart, green and integrated transport» & Societal Challenge 5 «Climate action, environment, resource efficiency and raw materials» - Horizon 2020



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

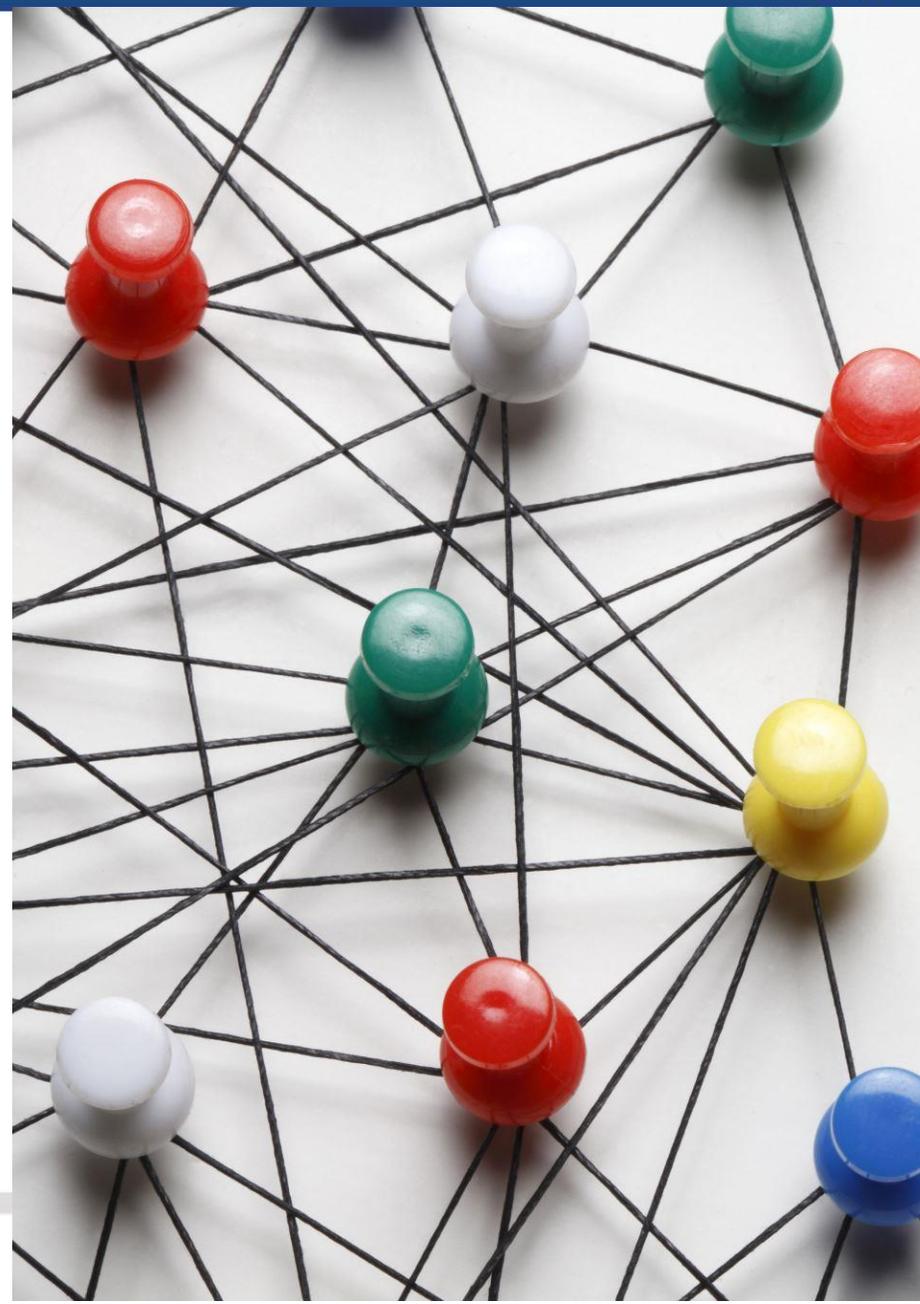


Minimum requirements

- 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)

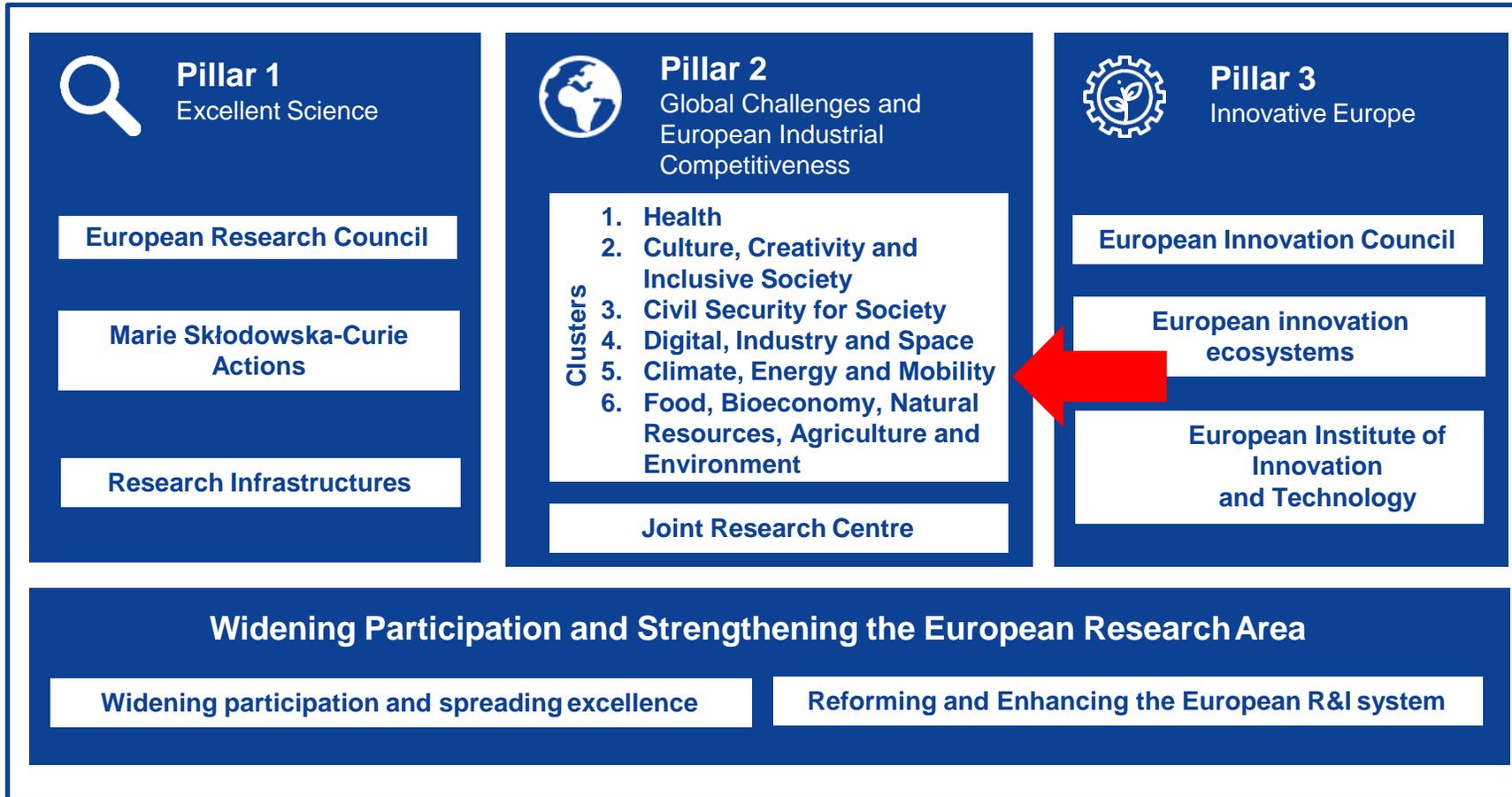
Funding rate: 100% of the total eligible costs

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 |



IMPACTS

DESTINATIONS

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 | |



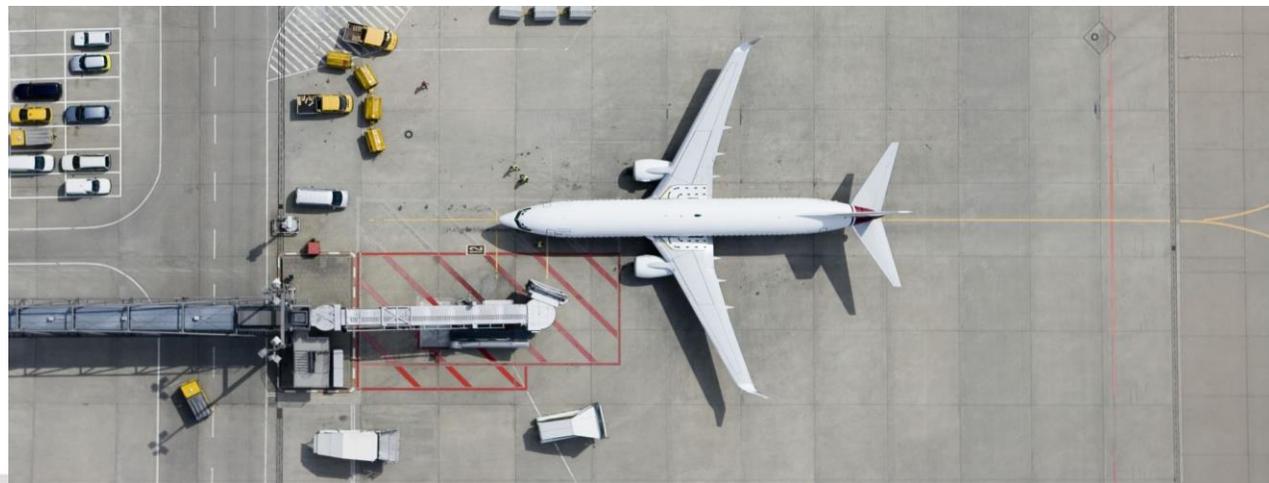
Destination 5: Clean and competitive solutions for all transport modes

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].



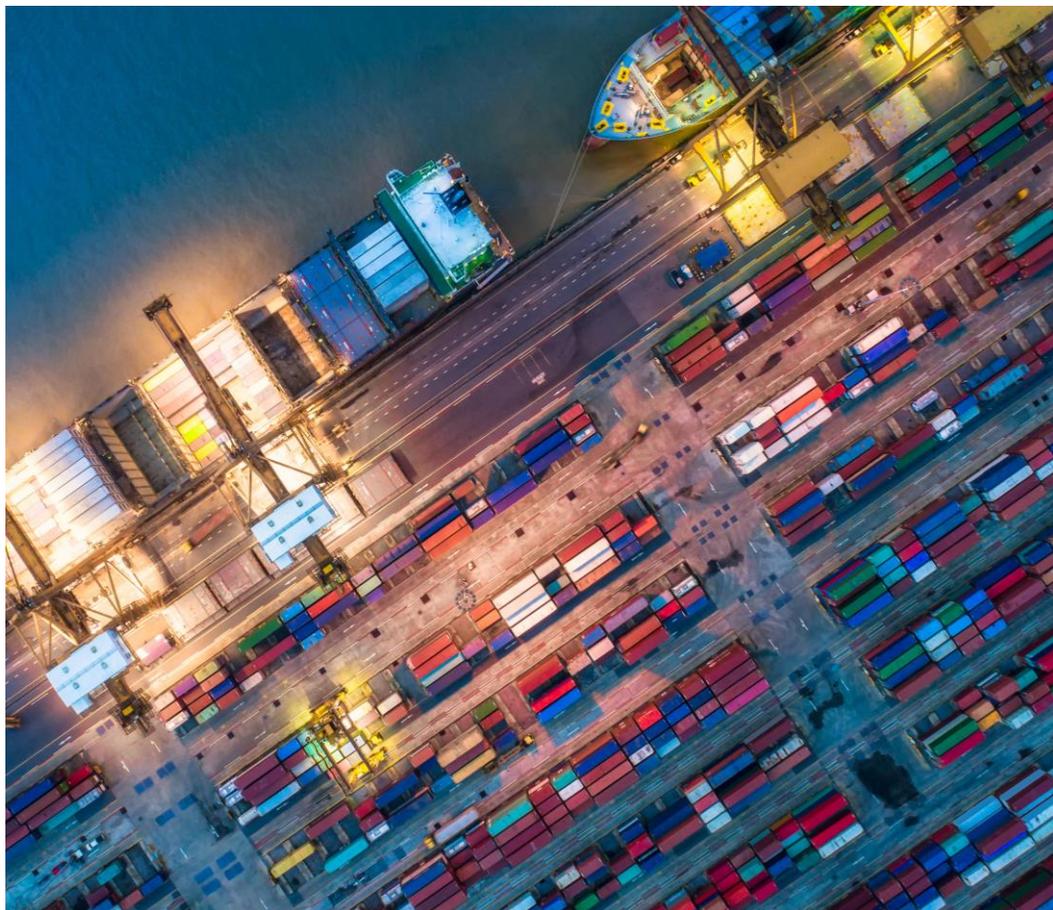


Topics 2021 – Aviation

| 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



- ▣ 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



- ▣ 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 |



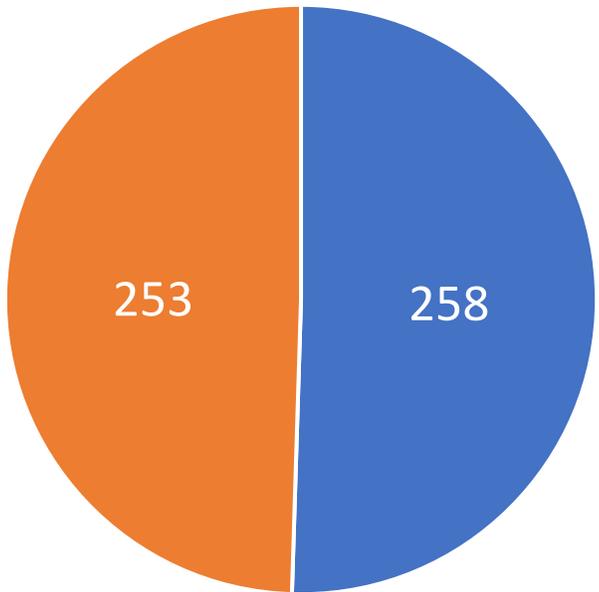
Topics 2021 – Cross-cutting

| TOPIC CODE | TOPIC TITLE | AREA | TOA | DEADLINE - TBC | BUDGET PER GRANT Mil € | TARGETED 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 | |



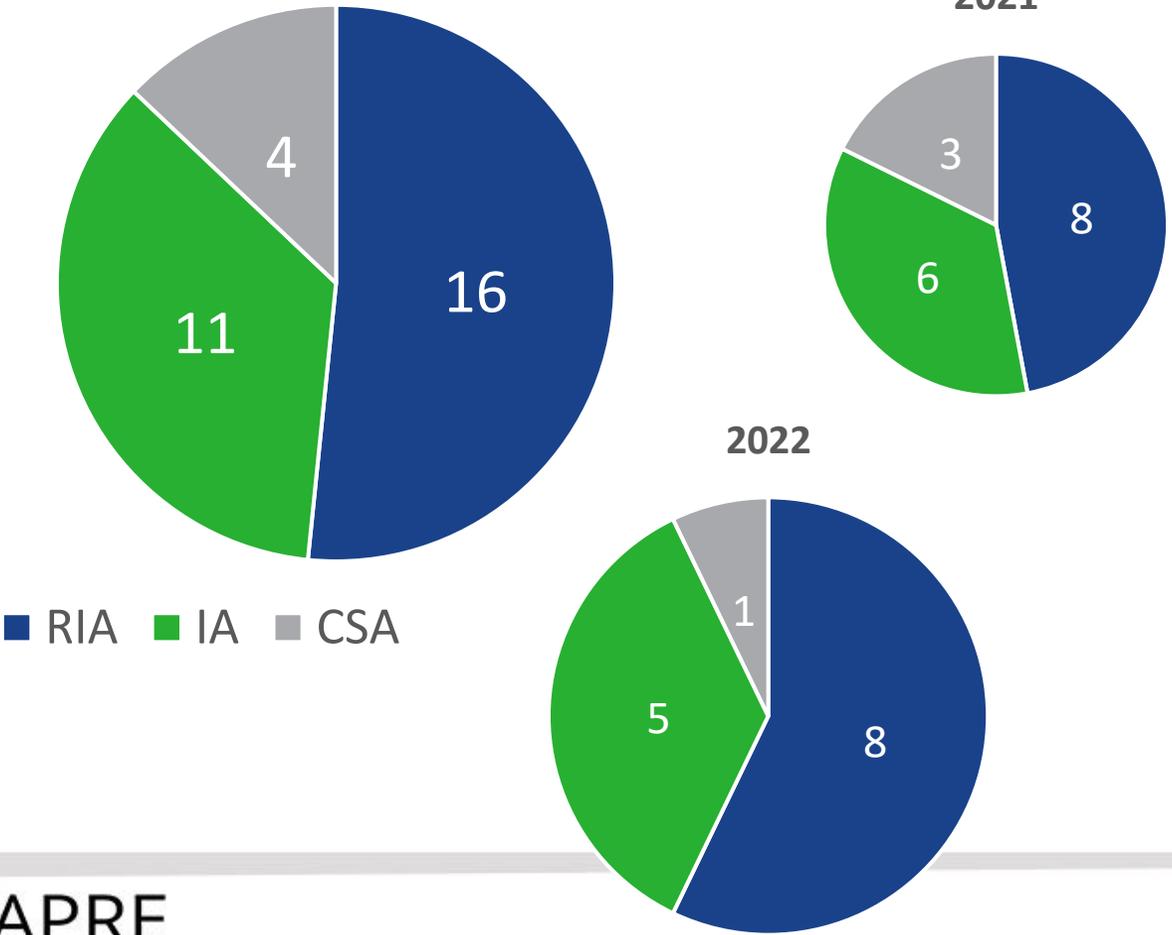
Destination 5: Clean and competitive solutions for all transport modes

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).



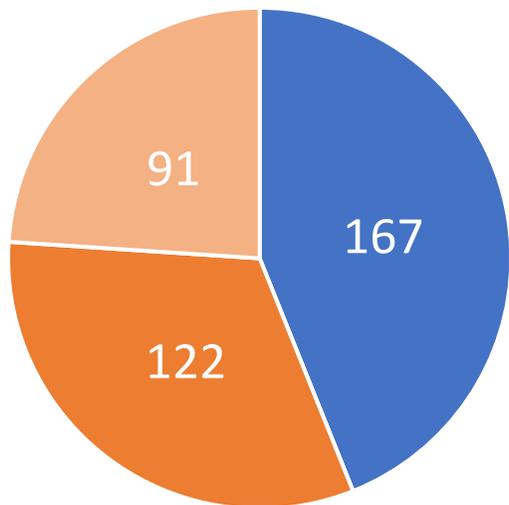
Topics 2021 – Multimodal transport, logistics, infrastructure

| 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 |



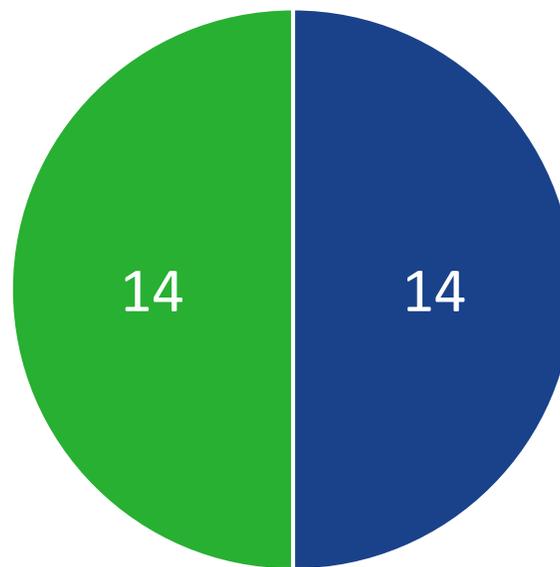
Destination 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods

Destination 6 - budget mil €

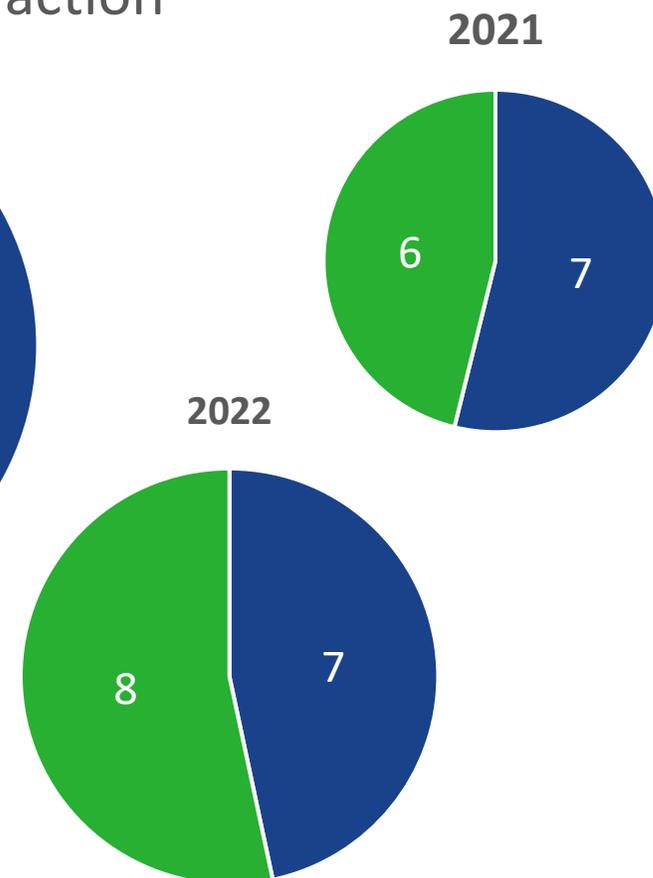


■ 2021 HORIZON-CL5-2021-D6-01 ■ 2022 HORIZON-CL5-2022-D6-01
■ 2022 HORIZON-CL5-2022-D6-02

Destination 6 - types of action



■ RIA ■ IA





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