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Agenzia per la Promozione della Ricerca Europea

# Il Work Programme “Climate, Energy and Mobility” – Presentazione delle opportunità di finanziamento

14/05/2021

Miriam de Angelis

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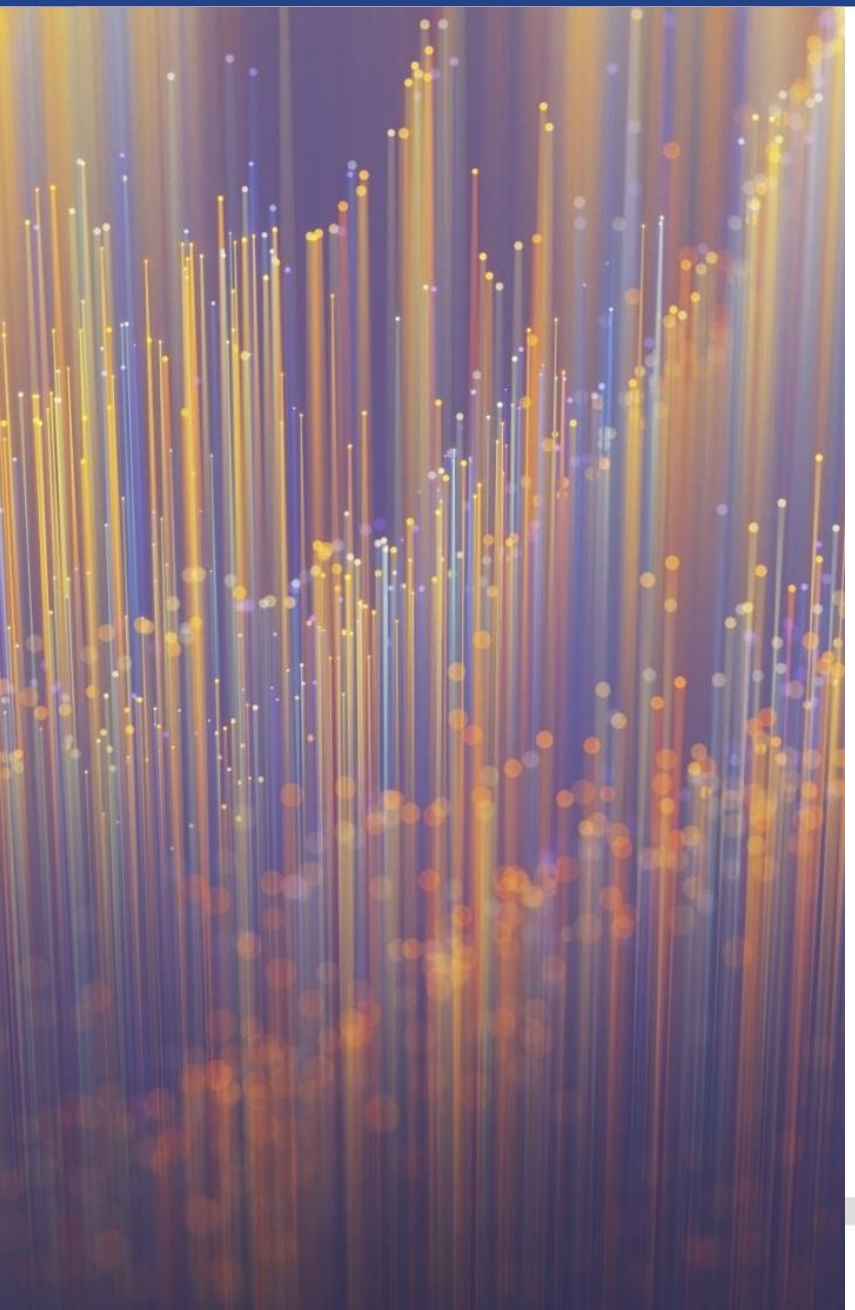
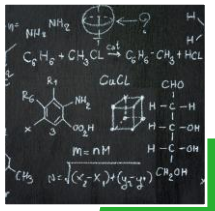


# Miriam de Angelis

- 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

# Horizon Europe

Horizon Europe is the EU's funding programme for research and innovation from 2021-2027 with budget of €95.5 billion.



**Science & technology**

- Fuel EU's scientific and technological excellence and the strengthen the ERA

**Society**

- tackle policy priorities, including green and digital transitions and SDGs

**Economy**

- boost Europe's innovation uptake , competitive ness and jobs

# 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*"

**New eligibility condition:** **Gender Equality Plan (applicable only from 2022 on)**

Participants that are public bodies, research organisations or higher education establishments from Members States and Associated countries **must have a gender equality plan**, covering minimum process-related requirements.

- A self-declaration will be requested at proposal stage (for all types of participants).
- Included in the entity validation process (based on self-declaration)

# 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

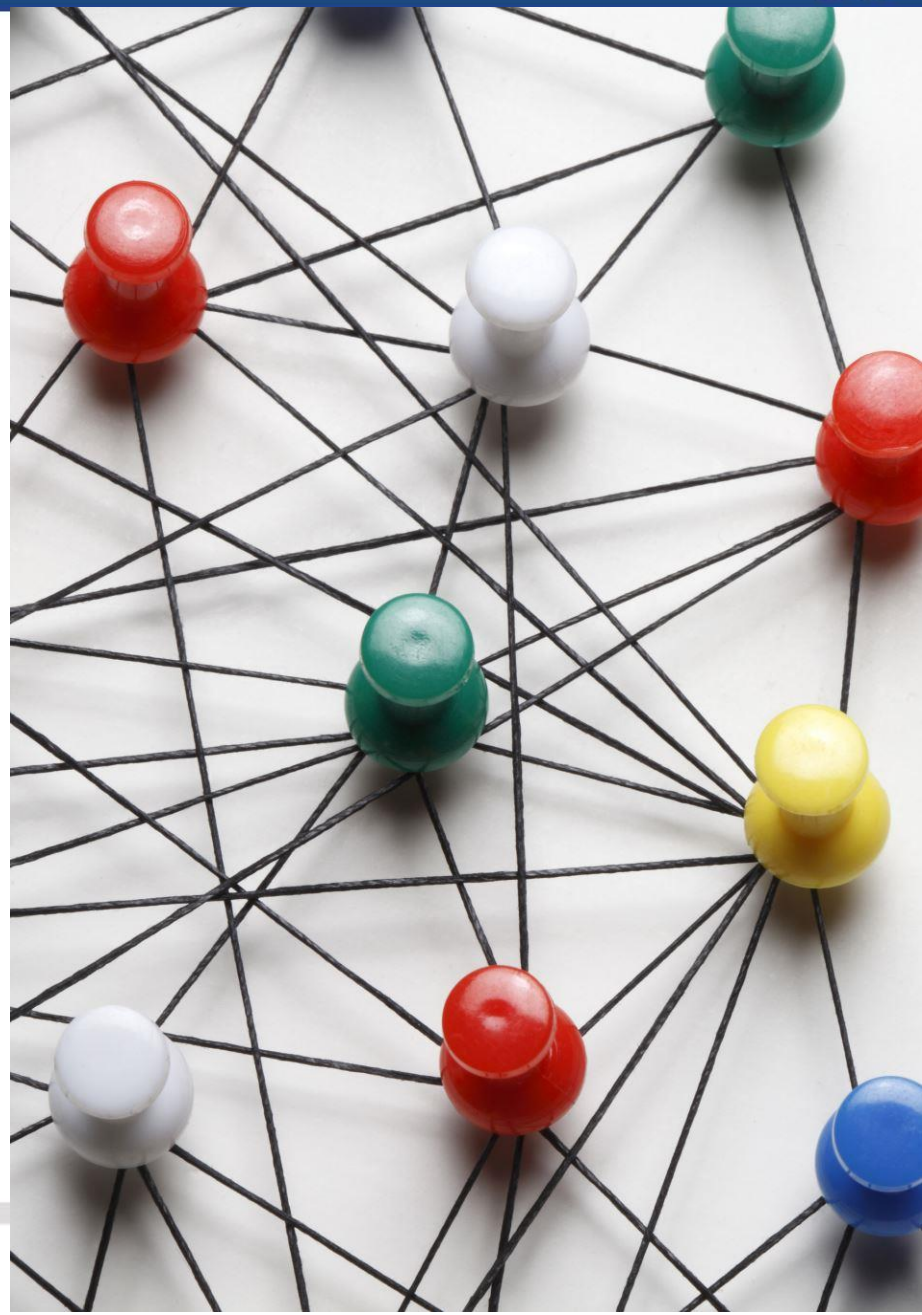
- Affiliated entities established in countries eligible for funding.
- EU bodies
- International organisations (IO):
  - International European research organisations are eligible for funding.
  - Other IO are not eligible (only exceptionally if participation is essential)
  - IO in a MS or AC are eligible 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 TH EWORK PROGRAMME (No of participants, type of participants)



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# 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***

(Source: the **General Annexes to the Work Programme)**

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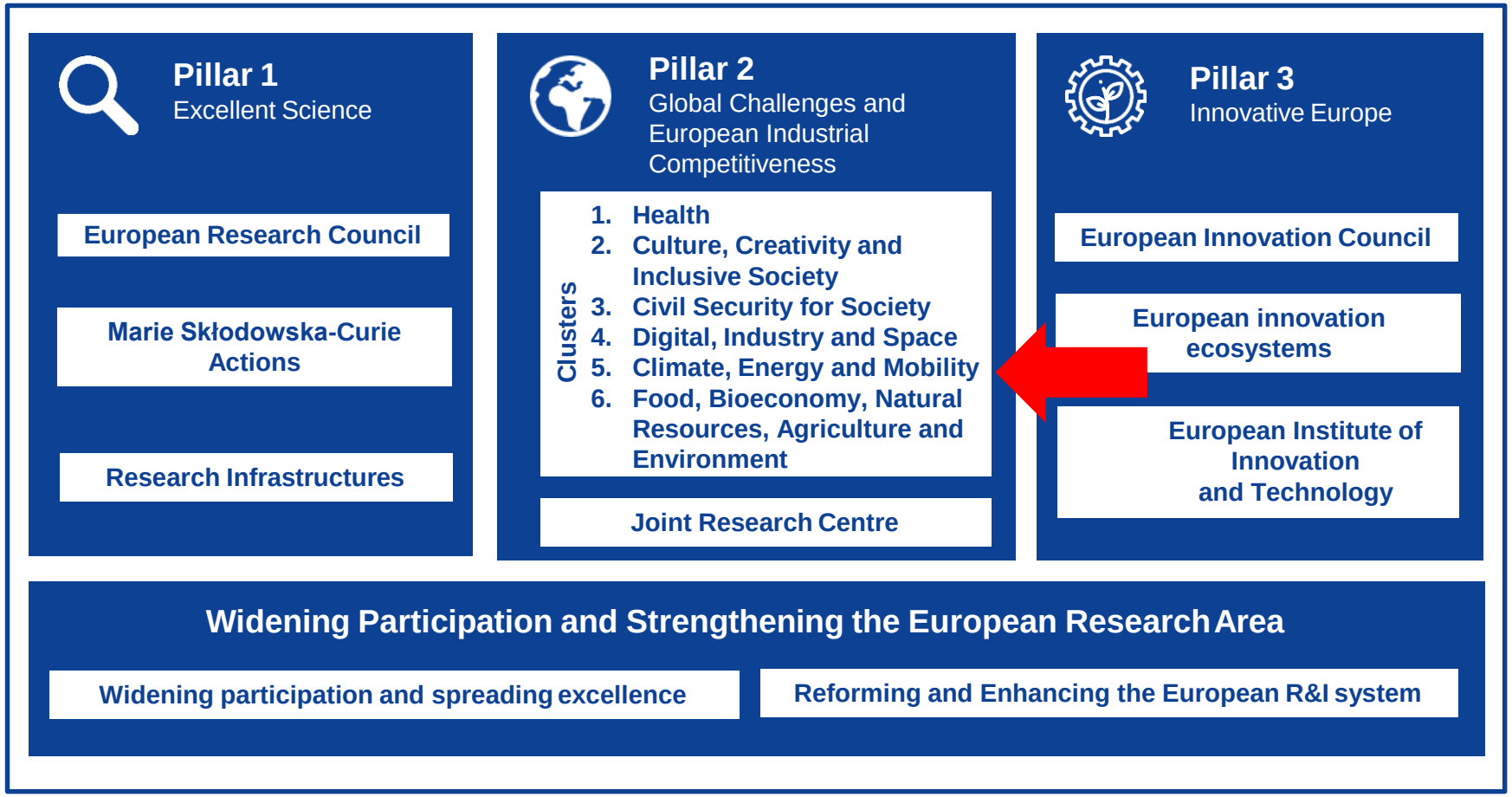
# Structure

# Horizon Europe: structure



# Cluster 5

*DISCLAIMER: Information included in this presentation on Cluster 5 work programme 2021 2022 is provisional since it has not been adopted nor endorsed by the European Commission.*

# 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 |
| Builddings and industrial facilities in energy transitions |
| Energy storage |
| Communities and cities |
| Smart mobility |
| Clean, safe and accessible transport and mobility |

# CL5 Destinations - Work Programme 2021-22

| IMPACTS | | DESTINATIONS |
|---|---|---|
| Transition to a climate-neutral resilient society and economy enabled through **climate science, pathways and responses to climate change (mitigation and adaptation) and behavioural transformations**. | 1 | 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**. | 2 | 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**. | 3 | 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. | 4 | 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. | 5 | 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. | 6 | 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

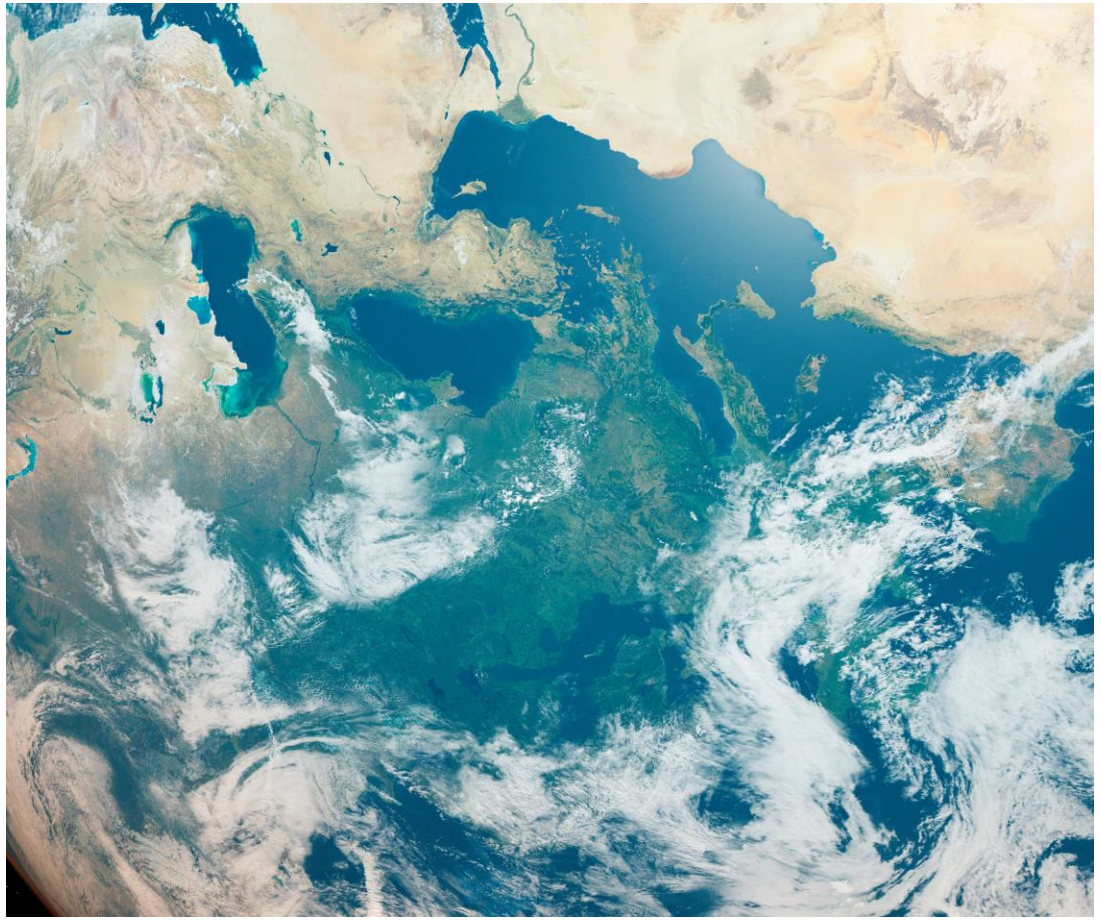
| Destination | Number of topics | Budget mln EUR] | % Share |
|---|---|---|---|
| **D1** Climate sciences and responses for the transformation towards climate neutrality | 17 | 274 | 9% |
| **D2** Cross-sectoral solutions for the climate transition | 27 | 388,5 | 13% |
| **D3** Sustainable, secure and 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

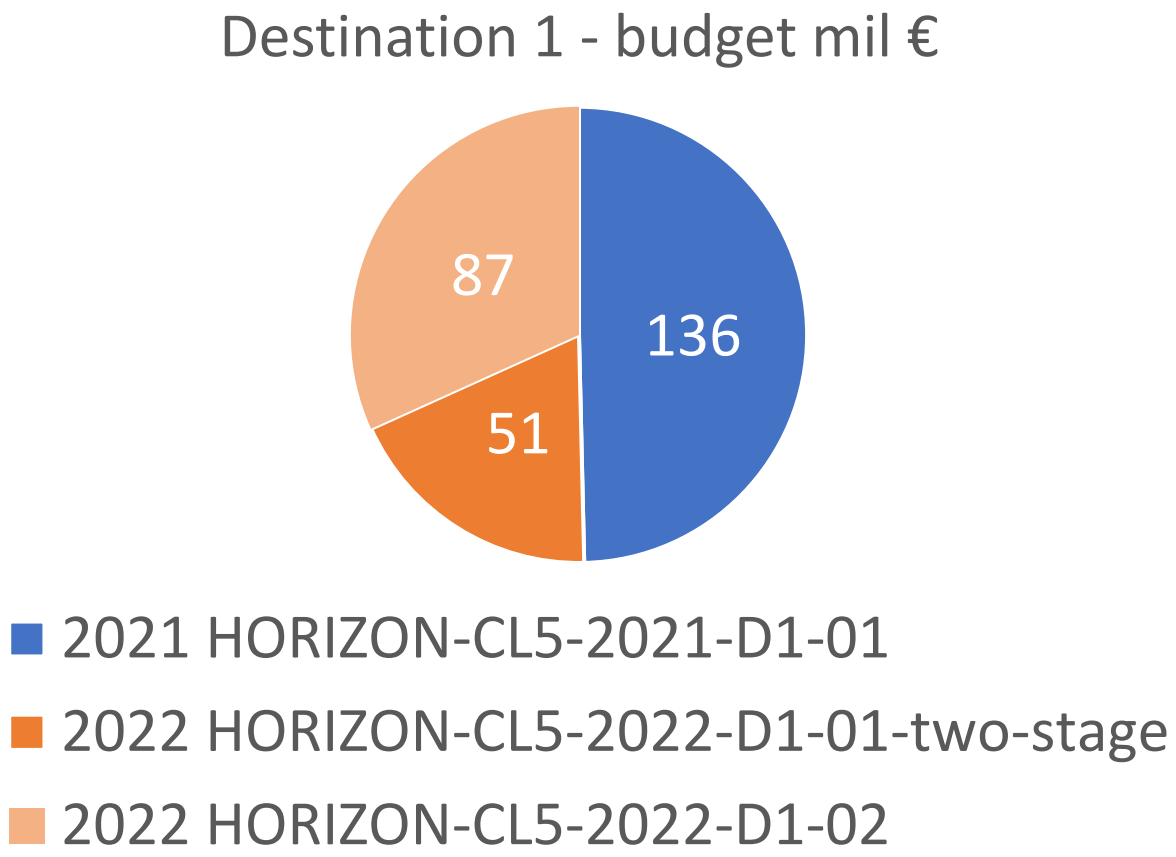
| DESTINATION | Call ID 2021 one stage | Call ID 2022 one stage | Call ID 2022 two stage |
|---|---|---|---|
| D1 Climate sciences and responses for the transformation towards climate neutrality | HORIZON-CL5-2021-D1-01 | HORIZON-CL5-2022-D1-02 | HORIZON-CL5-2022-D1-01-two-stage |
| D2 Cross-sectoral 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<br>HORIZON-CL5-2021-D3-02 | HORIZON-CL5-2022-D3-01<br>HORIZON-CL5-2022-D3-02<br>HORIZON-CL5-2022-D3-03 | |
| D4 Efficient, sustainable and inclusive energy use | HORIZON-CL5-2021-D4-01<br>HORIZON-CL5-2021-D4-02 | HORIZON-CL5-2022-D4-01<br>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<br>HORIZON-CL5-2022-D6-02 | |

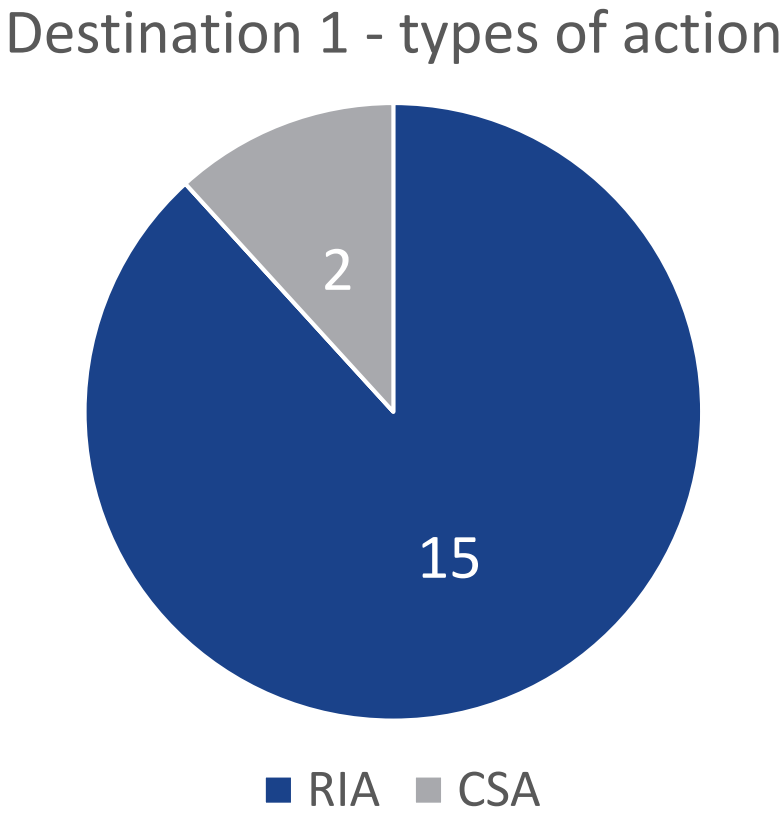
# Destination 1: Climate sciences and responses for the transformation towards climate neutrality

- Includes topics on: Earth system science; pathways to climate neutrality; climate change adaptation including climate services; social science for climate action; and better understanding of climate-ecosystems interactions.
- Synergies with Cluster 6 by planning for adequate resources for co-ordination and clustering activities [CL5 Destination 1 concentrates on climate science and modelling, CL6 supports R&I on the implementation of climate change mitigation and adaptation solutions.]



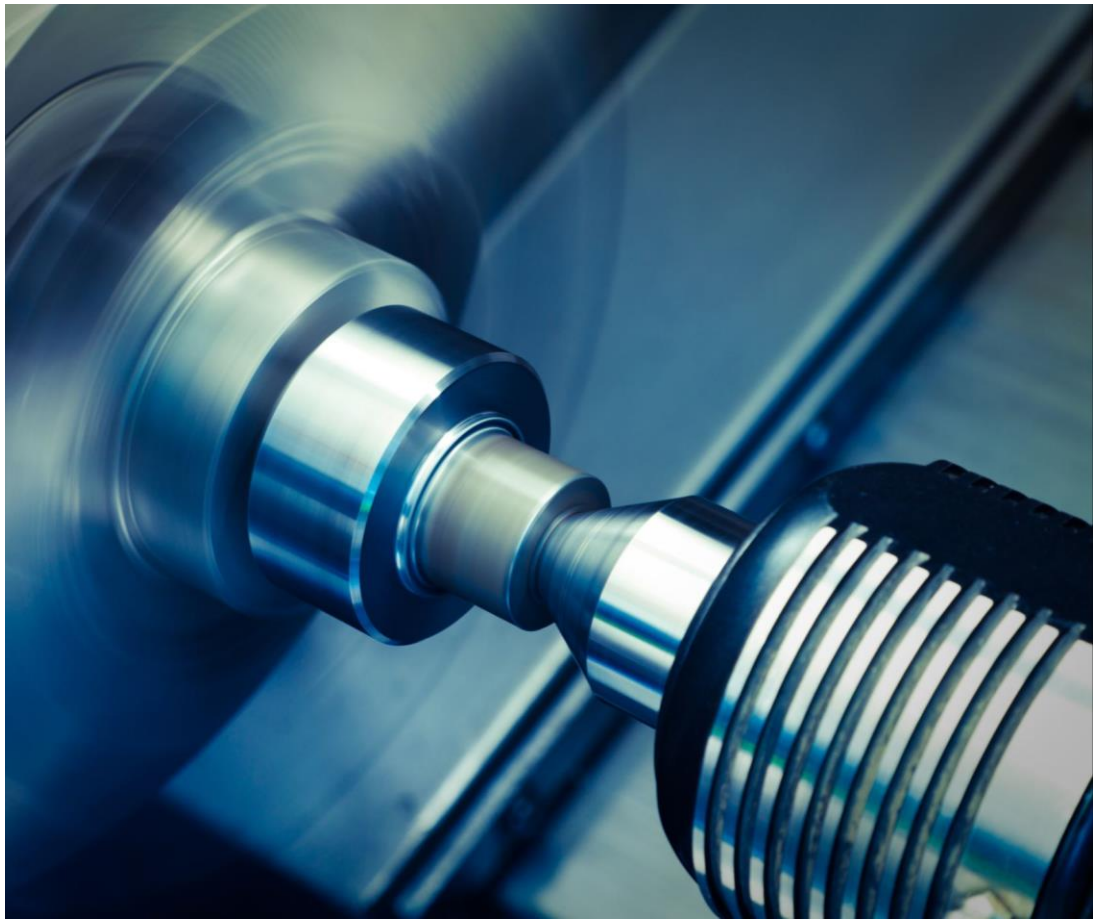
# Destination 1: Climate sciences and responses for the transformation towards climate neutrality



# Destination 2: Cross-sectoral solutions for the climate transition 1/3

- Covers **solutions for climate, energy and mobility applications**
- Includes topics from the **co-programmed Partnership on "Towards a competitive European industrial battery value chain for stationary applications and e-mobility"** with focus on:
  - battery materials, cell design, manufacturing and recycling;
  - operation of e-vehicles. Increased grid flexibility, increased share of renewables integration;
  - Life Cycle Assessment of each segment of the battery value chain. Innovative recycling network and technologies and circular designs;
  - demonstration of innovative use cases of battery integration in stationary energy storage and vehicles/vessels/aircrafts.

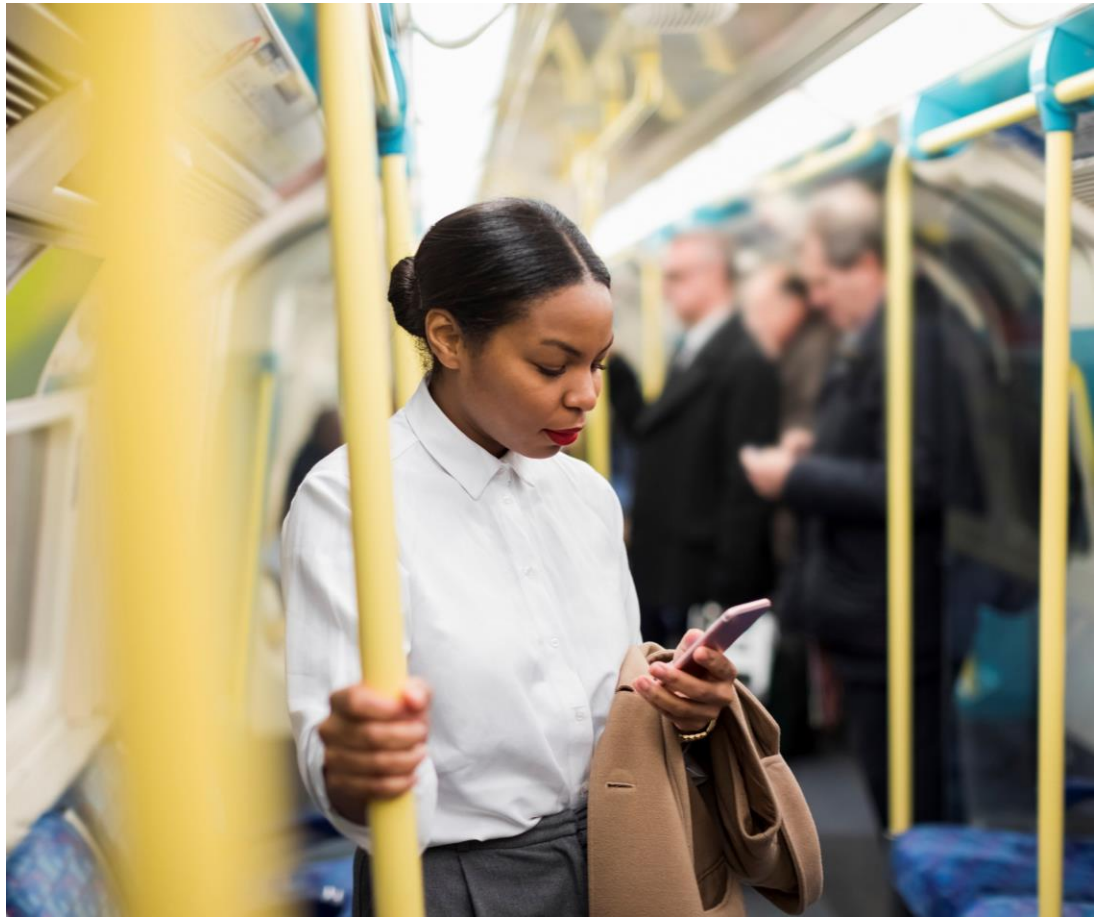


# Destination 2: Cross-sectoral solutions for the climate transition 2/3

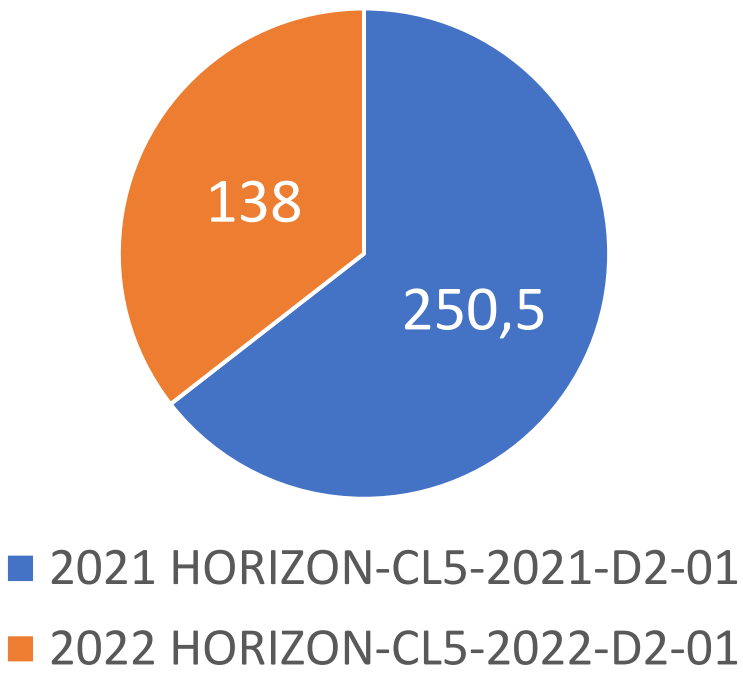
- Includes topics on **Emerging breakthrough technologies and climate solutions** targeting:
  - unanticipated high-risk/high return technologies enabling emerging zero-greenhouse gas and negative emissions in energy and transport;
  - Research in this area is mostly technological but should be accompanied by assessments of environmental impact, social and economic impacts, and possible regulatory needs as well as activities to support the creation of value chains and to build up new ecosystems of stakeholders.

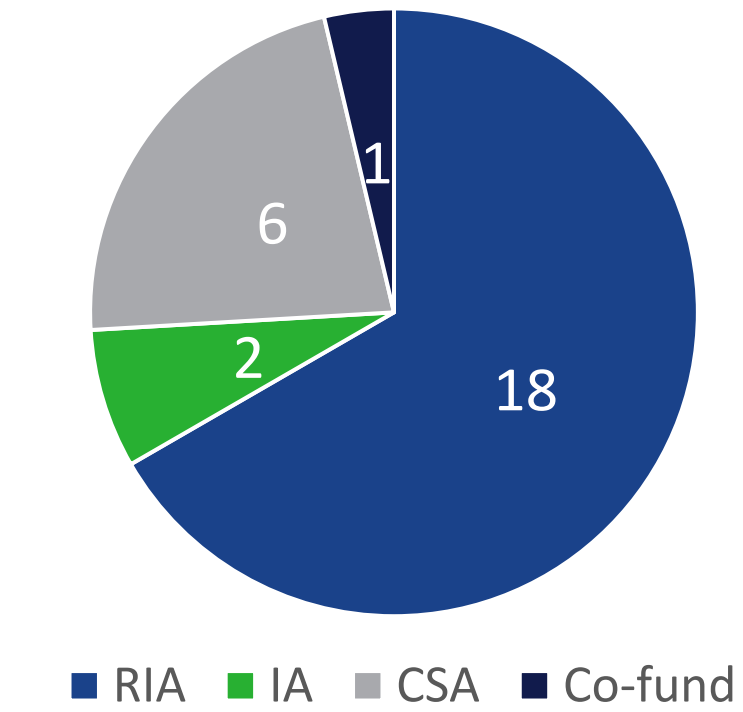
# Destination 2: Cross-sectoral solutions for the climate transition 3/3

- Includes topics on **Communities and cities:**
  - To be introduced during 2021 as an update to the WP2021, once the preparatory phase of the HE Missions is concluded;
- Includes a focus on **Citizens and stakeholder engagement**:
  - A better understanding of the societal implications of the climate transition;
  - More effective policy interventions, co-created with target constituencies and building on high-quality policy advice;
  - Greater societal support for transition policies and programs



# Destination 2: Cross-sectoral solutions for the climate transition



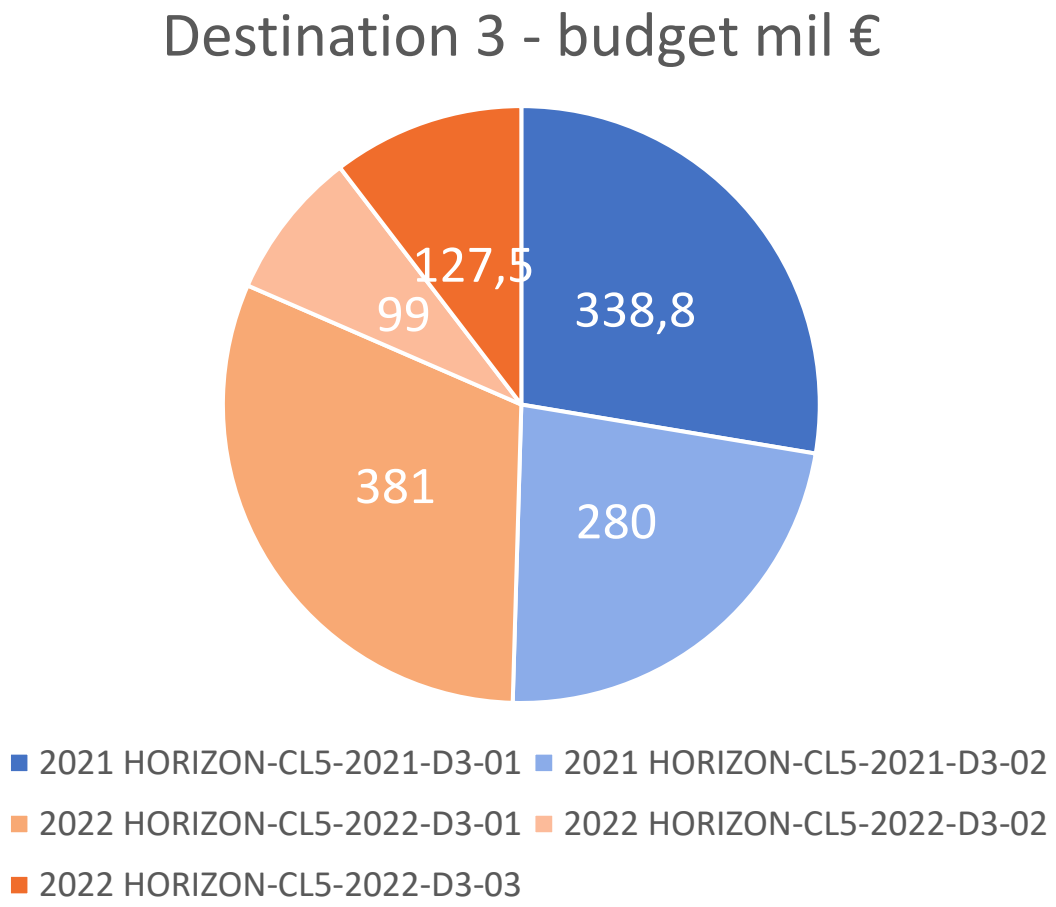



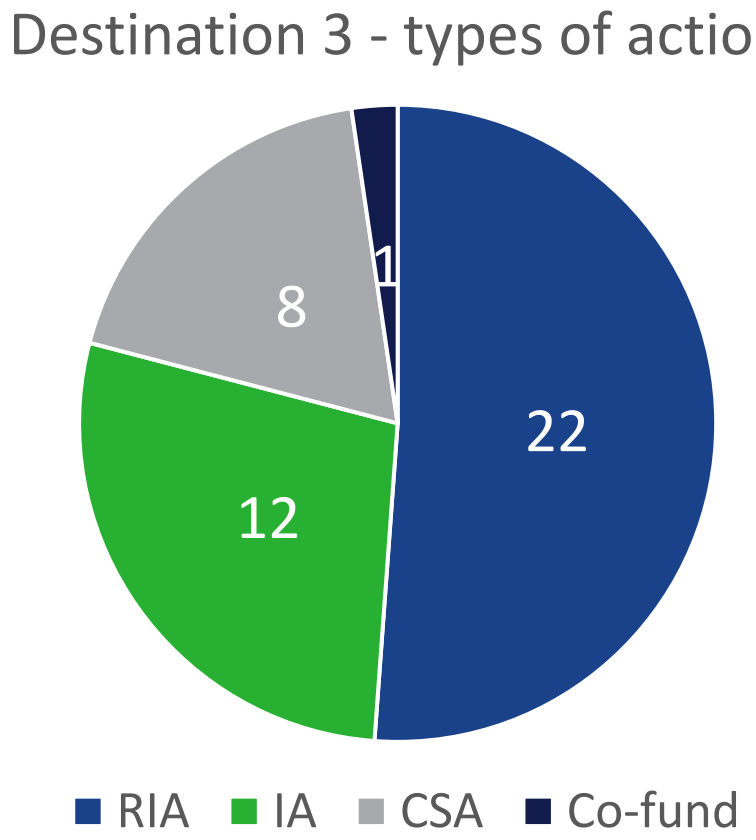
# Destination 3: Sustainable, secure and competitive energy supply

- includes activities in the areas of **renewable energy**, incl. wind energy, photovoltaics or bioenergy, and advanced renewable fuels, incl. synthetic and sustainable advanced biofuels
- **energy system, grids and storage** – incl. energy system planning and operation, electricity system reliability and resilience, storage development and integration and digitalisation of the energy system.
- development of **Carbon capture, utilisation and storage** (CCUS) in electricity generation and industry applications

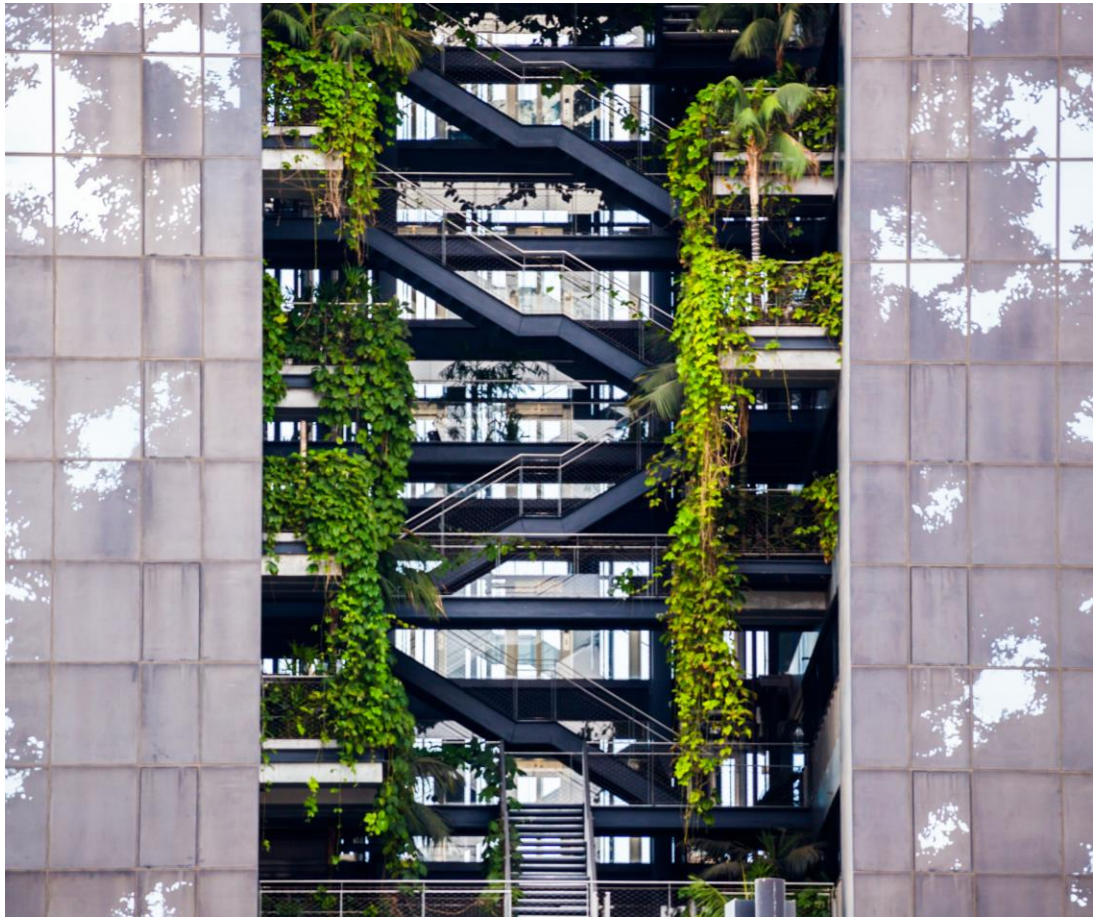
- integration of climate neutral, renewable energy carriers, such as **clean hydrogen** (Innovative energy storage solutions, incl. chemical, mechanical, electrical and thermal storage, are a key element);

# Destination 3: Sustainable, secure and competitive energy supply



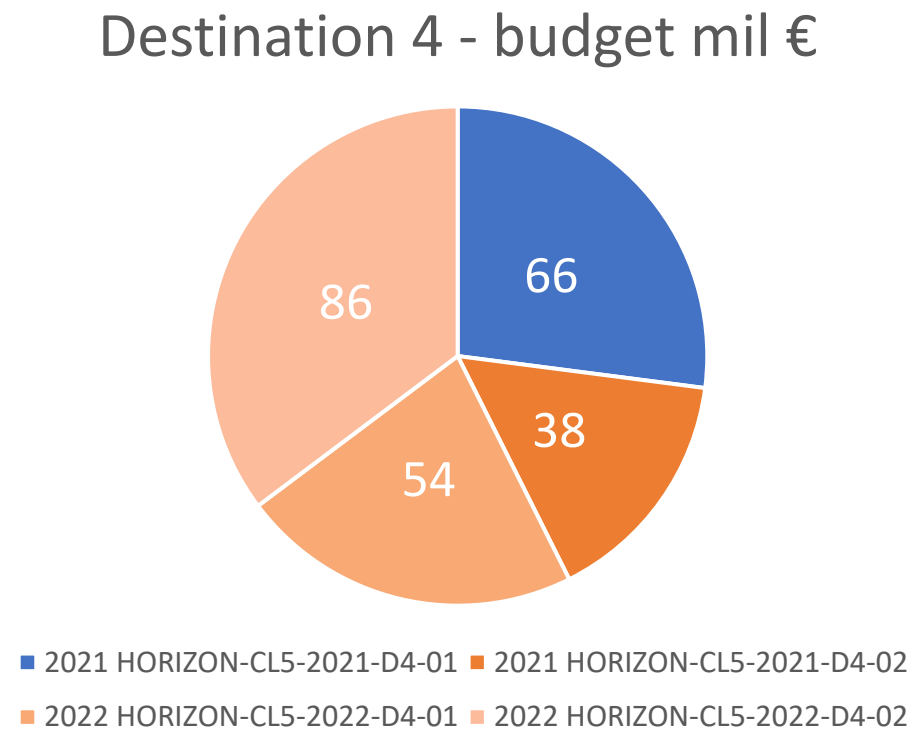



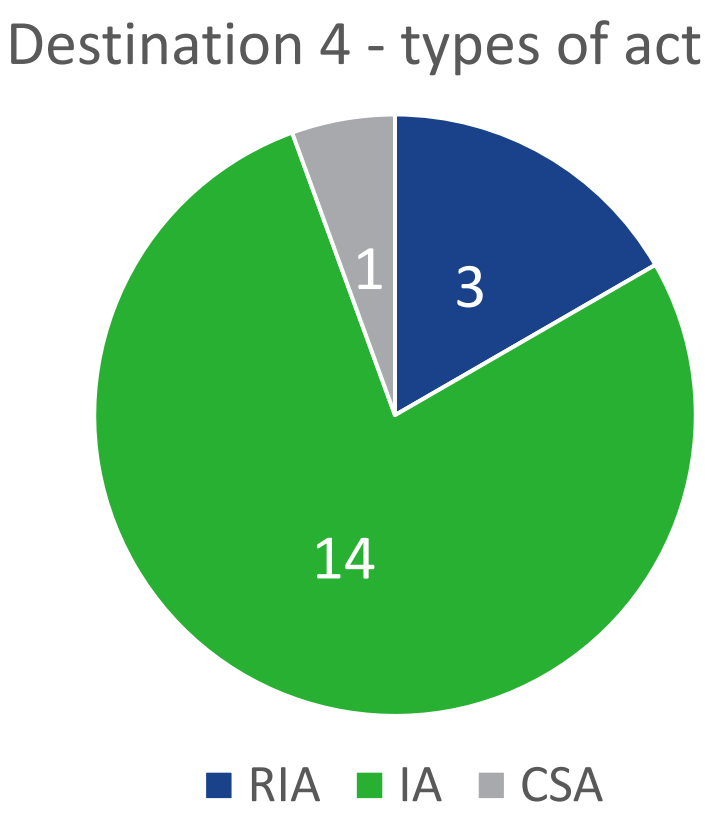
# Destination 4: Efficient, sustainable and inclusive energy use



- Covers the electrification of demand side sectors (buildings, mobility, industry).
- Focuses on **Highly energy-efficient and climate neutral European building stock:** go beyond improving the energy and resource efficiency of buildings and include a qualitative, aesthetic and human dimension (new creative design and architectural solutions).
- Includes topics from the **co-programmed Partnership Built4People**
- Focuses on **Industrial facilities in the energy transition,** namely thermal energy management in industry.

# Destination 4: Efficient, sustainable and inclusive energy use



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

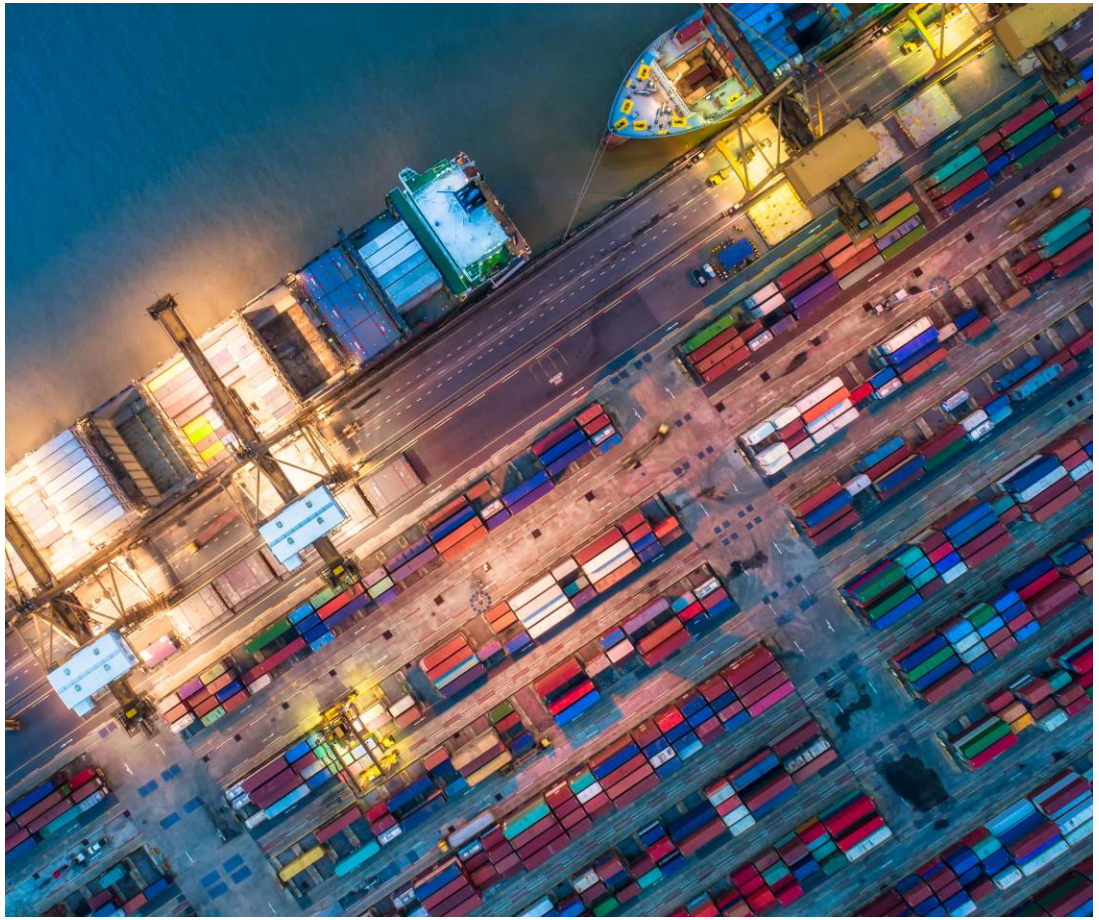
- Includes topics from Co-programmed Partnership "**Towards zero emission road transport" (2Zero)** with focus on:
  - user-centric solutions (technologies and services) for road-based mobility.
  - Increased user acceptance, improved air quality.
  - charging infrastructure concepts and technologies 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.

# 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].**

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

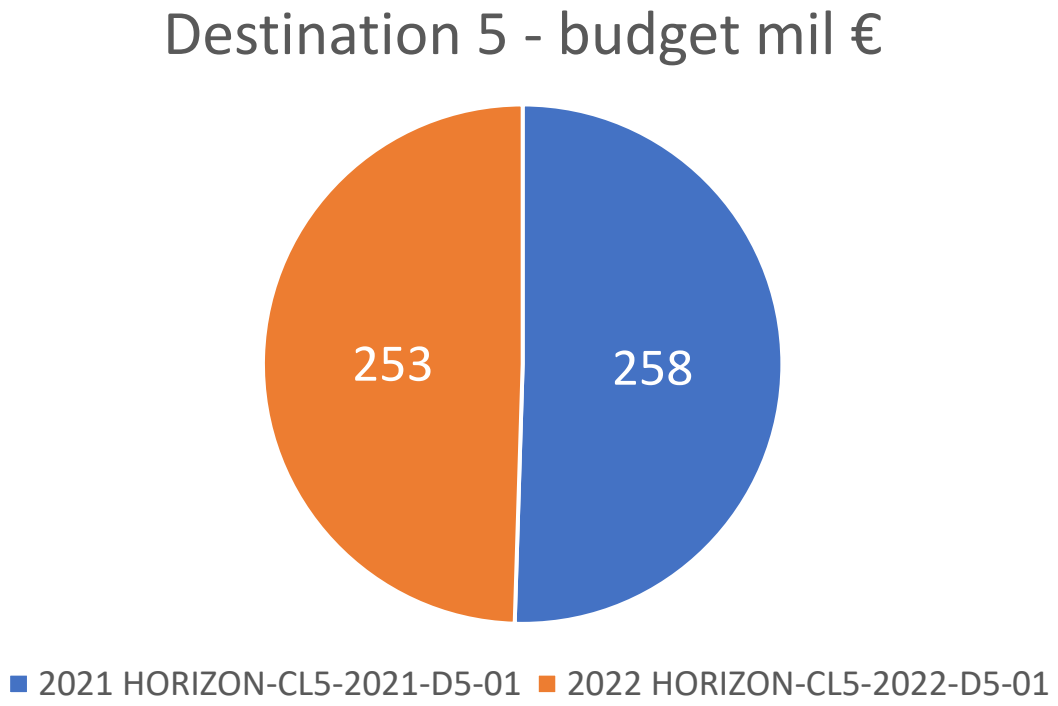


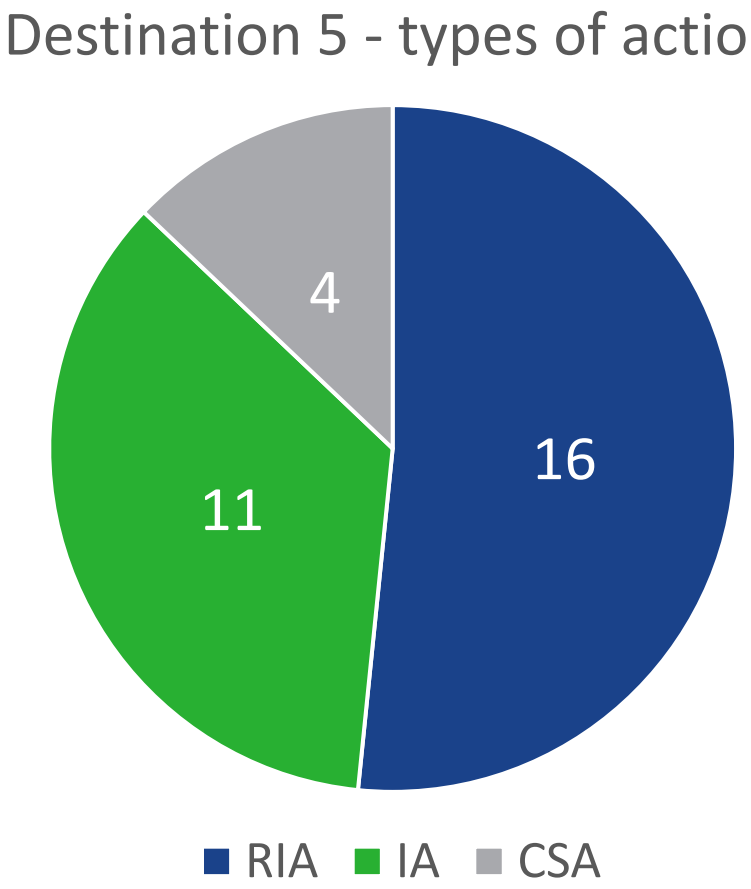
- Includes topics from the **co-programmed Partnership 'Zero Emission Waterborne Transport'** with focus on:
  - deployment of climate neutral fuels and significant electrification of shipping.
  - energy efficiency and lower fuel consumption of vessels.
  - innovative port infrastructure (bunkering 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.

# 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)

# Destination 5: Clean and competitive solutions for all transport modes



# 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.

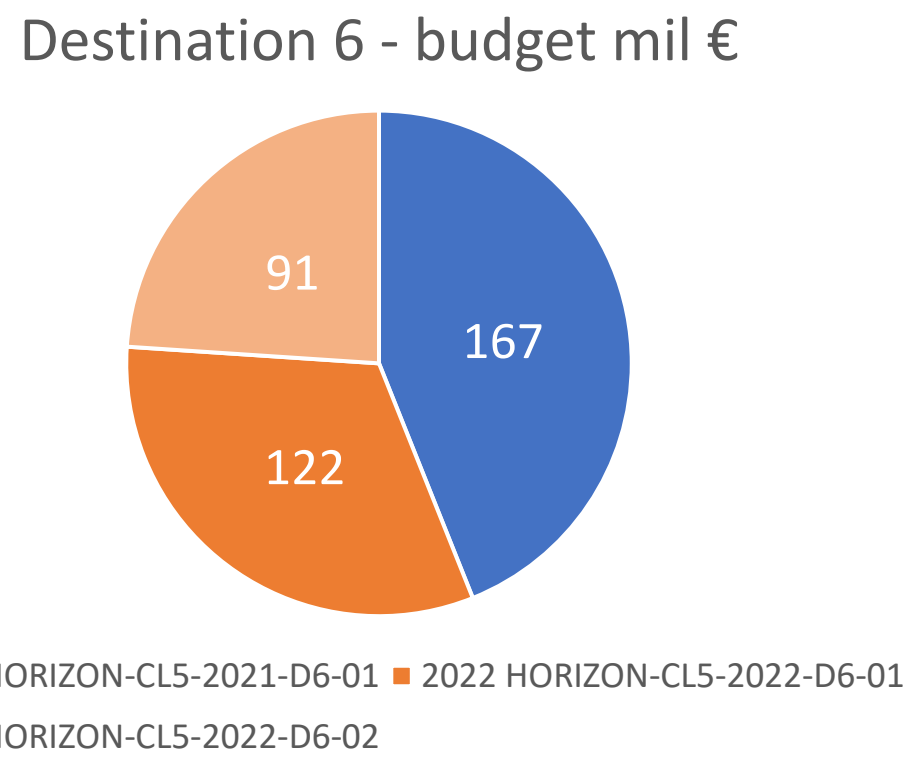
# Destination 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods 2/3

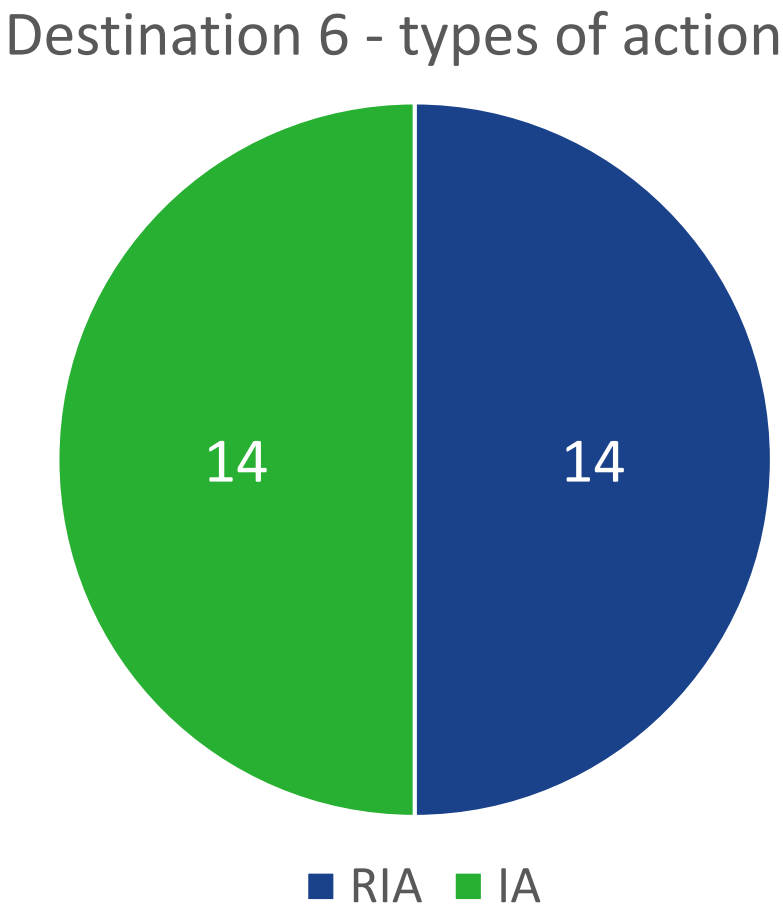
- Includes topics on **Multimodal and sustainable transport systems for passengers and goods** targeting:
  - physical and digital infrastructure.
  - long-haul, regional and urban freight transport and logistics.
  - Reduced external costs (e.g. congestion, traffic jams, emissions, air and noise pollution, 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.

# 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
- Approches are requested that consider technologies; regulations (alongside acceptable level of risks); and human factors (individual and organisational aspects, including interaction with automation).

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



# Cluster 5 in Missions & Partnerships

# European Partnerships

- bring the European Commission and private and/or public partners together to address Europe's most pressing challenges through concerted research and innovation initiatives.
- help to avoid the duplication of investments and contribute to reducing the fragmentation of the research and innovation landscape in the EU.

**Co-programmed**

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by HE

**Co-funded**

Based on a joint programme agreed and implemented by partners; commitment of partners for financial and in-kind contributions

**Institutionalised**

Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by HE

# Overview of 49 candidate European Partnerships

**PILLAR II** - Global challenges & European industrial competitiveness

**PILLAR III** - Innovative Europe

| CLUSTER 1: Health | CLUSTER 4: Digital, Industry & Space | CLUSTER 5: Climate, Energy & Mobility | CLUSTER 6: Food, Bioeconomy, Agriculture, ... | EIT | SUPPORT TO INNOVATION ECOSYSTEMS |
|---|---|---|---|---|---|
| Innovative Health Initiative | Key Digital Technologies | Clean Hydrogen | Circular Bio-based Europe | InnoEnergy | Innovative SMEs |
| Global Health Partnership | Smart Networks & Services | Clean Aviation | Rescuing Biodiversity to Safeguard Life on Earth | Climate | |
| Transformation of health systems | High Performance Computing | Single European Sky ATM Research 3 | Climate Neutral, Sustainable & Productive Blue Economy | Digital | |
| Chemicals risk assessment | European Metrology (Art. 185) | Europe's Rail | Water4All | Food | |
| ERA for Health | AI-Data-Robotics | Connected and Automated Mobility (CCAM) | Animal Health & Welfare* | Health | |
| Rare diseases* | Photonics | Batteries | Accelerating Farming Systems Transitions* | Raw Materials | |
| One-Health Anti Microbial Resistance* | Made in Europe | Zero-emission waterborne transport | Agriculture of Data* | Manufacturing | |
| Personalised Medicine* | Clean steel – low-carbon steelmaking | Zero-emission road transport | Safe & Sustainable Food System* | Urban Mobility | |
| Pandemic Preparedness* *Co-funded or co-programmed* | Processes4Planet | Built4People | | Cultural and Creative Industries | |
| | Global competitive space systems** | Clean Energy Transition | | | |
| | | Driving Urban Transitions | | | |

**CROSS-PILLARS II AND III**

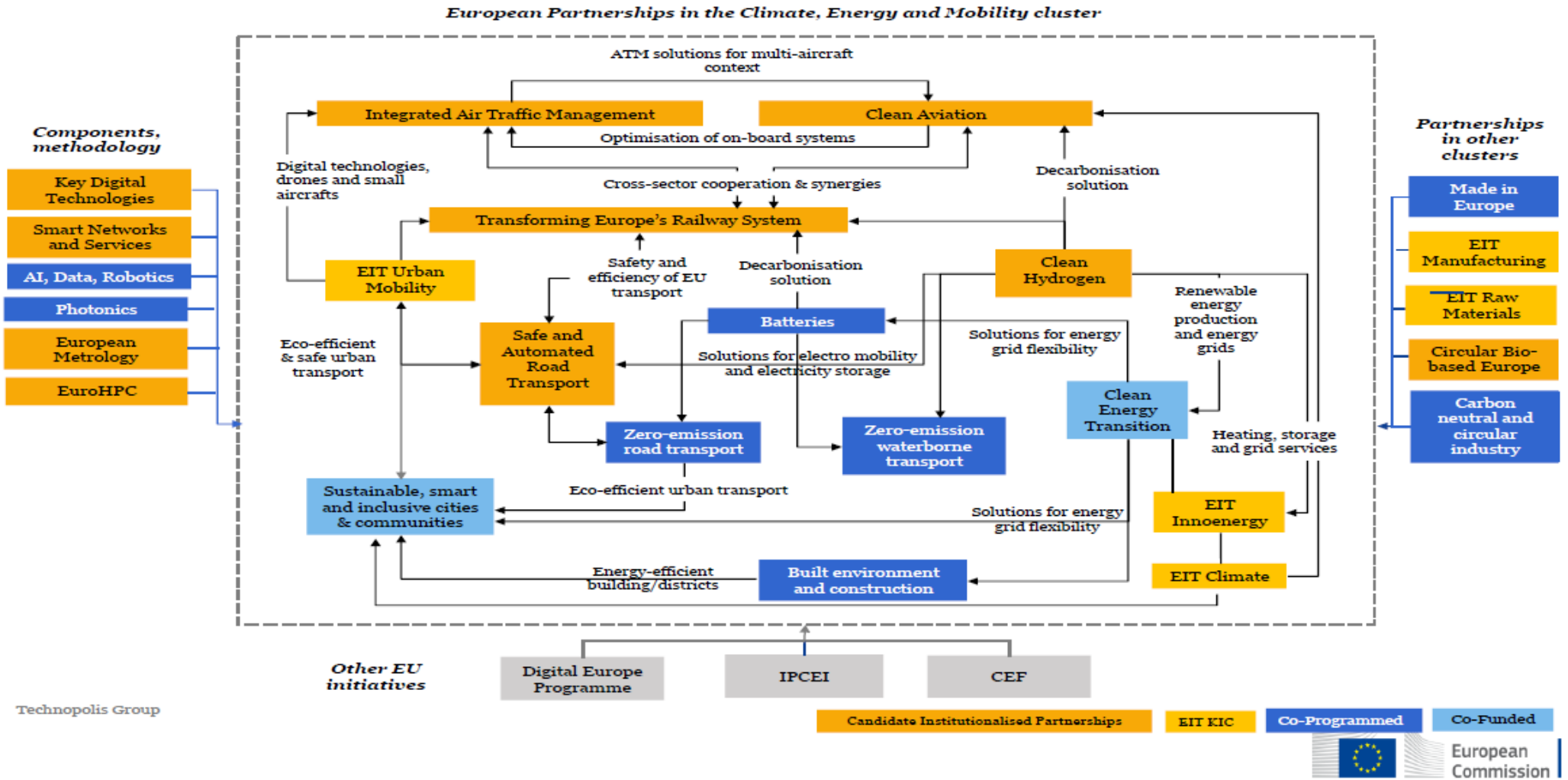
European Open Science Cloud

- Institutionalised Partnerships (Art 185/7)
- Institutionalised partnerships / EIT KICs
- Co-Programmed
- Co-Funded

* *Calls with opening dates in 2023-24*
** *Calls with opening dates not before 2022*

European Commission

# Links among Cluster 5 candidate partnerships




Technopolis Group

European Commission

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# Missions

- **portfolios of actions across disciplines** intended to achieve a measurable goal within a set timeframe.
- bold and inspirational, and hence have wide societal or economic relevance;
- **Gain strong visibility and impact.**
- spark activity across disciplines, sectors and actors;
- open to multiple, bottom-up solutions.
- programmed within the Global Challenges and European Industrial Competitiveness pillar (II), but may also benefit from actions carried out within other parts of the Programme as well as complementary actions carried out under other Union funding programmes.

# 5 Mission areas

Adaptation to climate change, including societal transformation

Cluster 5, Cluster 2

Cancer

Cluster 1

Soil health and food

Cluster 6

Climate-neutral and smart cities

Cluster 5

Healthy oceans, seas, coastal and inland waters

Cluster 6

# Mission Board proposals

- **Conquering Cancer: Mission Possible**

Targets by 2030: more than 3 million more lives saved, living longer and better, achieve a thorough understanding of cancer, prevent what is preventable, optimisediagnosis and treatment, support the quality of life of all people exposed to cancer, and ensure equitable access to the above across Europe.

- **A Climate Resilient Europe -Prepare Europe for climate disruptions and accelerate the transformation to a climate resilient and just Europe by 2030**

Targets by 2030: prepare Europe to deal with climate disruptions, accelerate the transition to a healthy and prosperous future within safe planetary boundaries and scale up solutions for resilience that will trigger transformations in society.

- **Mission Starfish 2030: Restore our Ocean and Waters**

Targets by 2030: cleaning marine and fresh waters, restoring degraded ecosystems and habitats, decarbonising blue economy in order to sustainably harness the essential goods and services they provide.

- **100 Climate-Neutral Cities by 2030 -by and for the citizens**

Targets by 2030: support, promote and showcase 100 European cities in their systemic transformation towards climate neutrality by 2030 and turn these cities into innovation hubs for all cities, benefiting quality of life and sustainability in Europe.

- **Caring for Soil is Caring for Life**

Targets by 2030: at least 75% of all soils in the EU are healthy for food, people, nature and climate. The proposed mission combines research and innovation, education and training, investments and the demonstration of good practices using “Living labs” (experiments and innovation in a laboratory on the ground) and “Lighthouses” (places to showcase good practices).

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