

Il cluster 5 “Climate, Energy and Mobility” Obiettivi, peculiarità, bandi e scadenze

Serena Borgna, APRE

borgna@apre.it

17 Luglio 2023

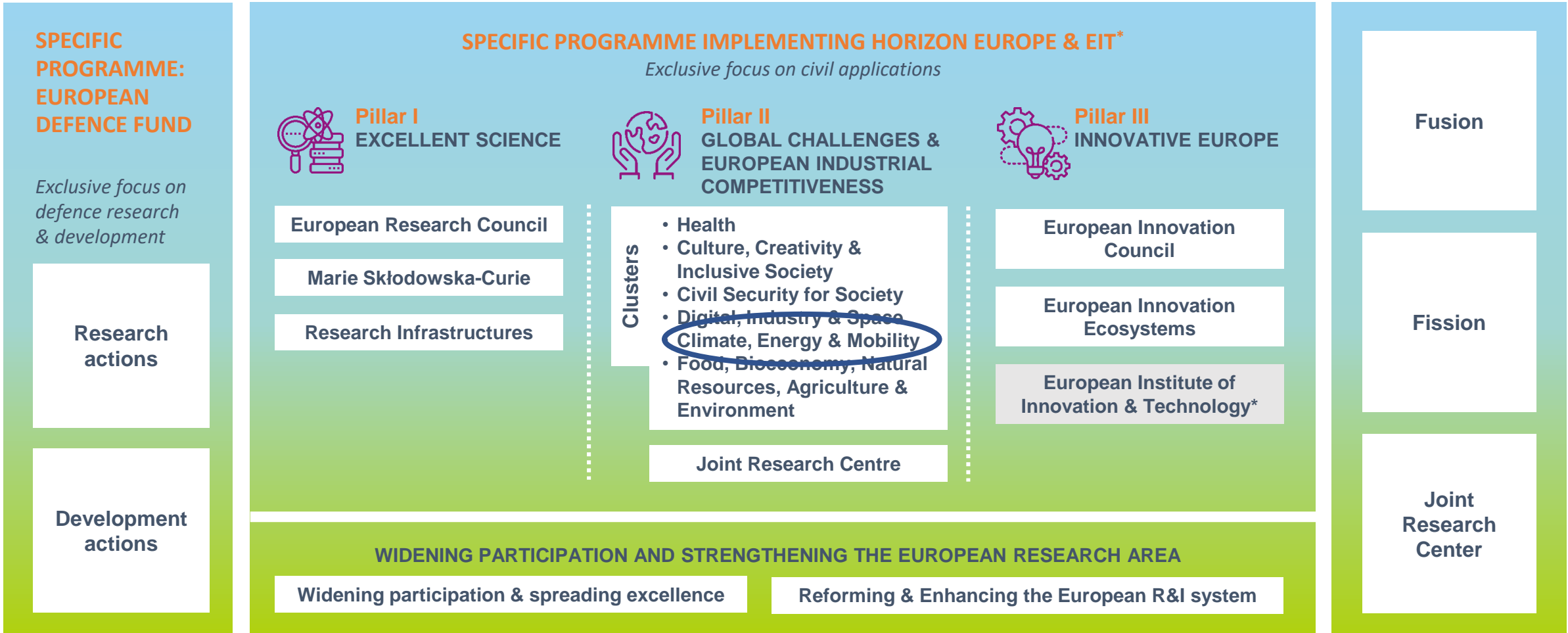


Cluster 5

Climate, Energy and Mobility

HORIZON EUROPE

EURATOM



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

Cluster 5 Work Programme 2023-24

- 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 the work programme (incl. Co-Programmed Partnerships) 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



EU Policy priorities



Climate Action

- EU Climate Law (EU climate neutral by 2050)
- 2030 Climate Target Plan (55% GHG reduction by 2030)
- Make sectoral legislation ‘fit for 55’
- EU Climate Adaptation Strategy
- Zero Pollution Action Plan

Energy

- **REPowerEU**
- EU Strategy for Energy System Integration
- Hydrogen strategy
- Renovation wave for Europe
- Offshore renewable energy

Mobility

- Sustainable and Smart Mobility Strategy

Research and Innovation

- A new European Research Area



WP 2023-2024: EU policy objectives

European Green Deal

- Great majority of topics contribute to Green Deal objectives and initiatives in energy and transport/mobility

Developing an economy that works for people

- Many topics address industrial competitiveness, training and skills, business models and standardisation

Europe fit for the digital age

- Half of all topics foster IT- (and data-) driven solutions

Stronger Europe in the world

- Many topics call for international cooperation, e.g. in the context of Mission Innovation or EU-Africa cooperation

New push for European democracy

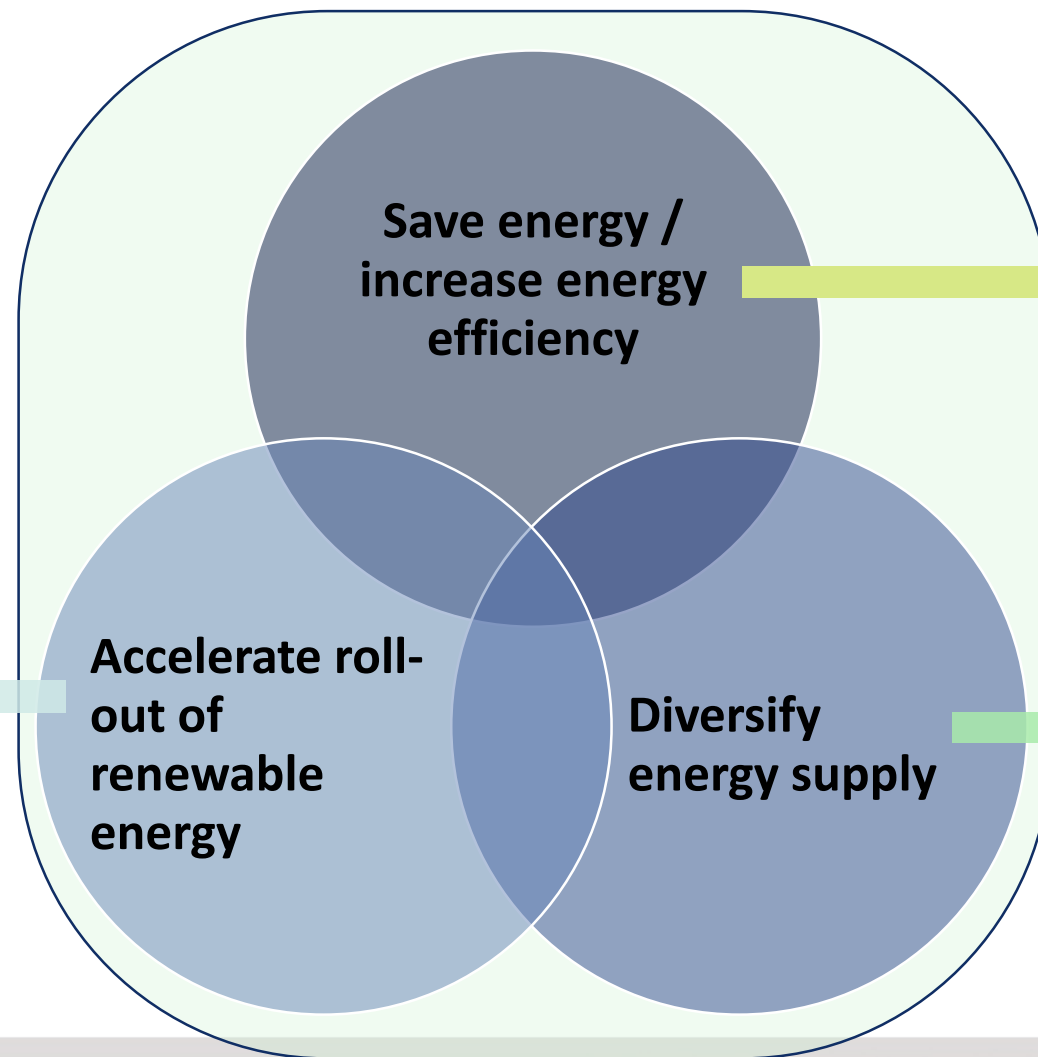
- Focus on citizen engagement and mainstreaming of social sciences and humanities (SSH) across many topics



Contribution to RePowerEU

Destination 2, 3, 4

- Cheaper and more performant **renewable energy technologies** (solar energy, wind energy, ocean energy, geothermal energy, hydro power, renewable fuels, heat pumps, solar heating)
- More flexible and resilient **energy grids**
- Better and smarter **energy storage** solutions



- More energy-efficient **building stock**
- Increased **energy efficiency in industry**
- More efficient **mobility solutions**
- Cleaner and more efficient **transport modes**

Destination 2, 4, 5, 6

- Maturing **hydrogen-based solutions**

Destination 3, 5



EU Hydrogen Strategy

EU Solar Strategy

Cluster 5 work programme 2023-2024

Covering the whole hydrogen value chain:

- Climate impact of the hydrogen economy
- Hydrogen test bed
- Storage
- Energy production
- Fuel production (aviation, waterborne transport)

In total 17 topics for a total of 284,5 M€

Covers the following areas:

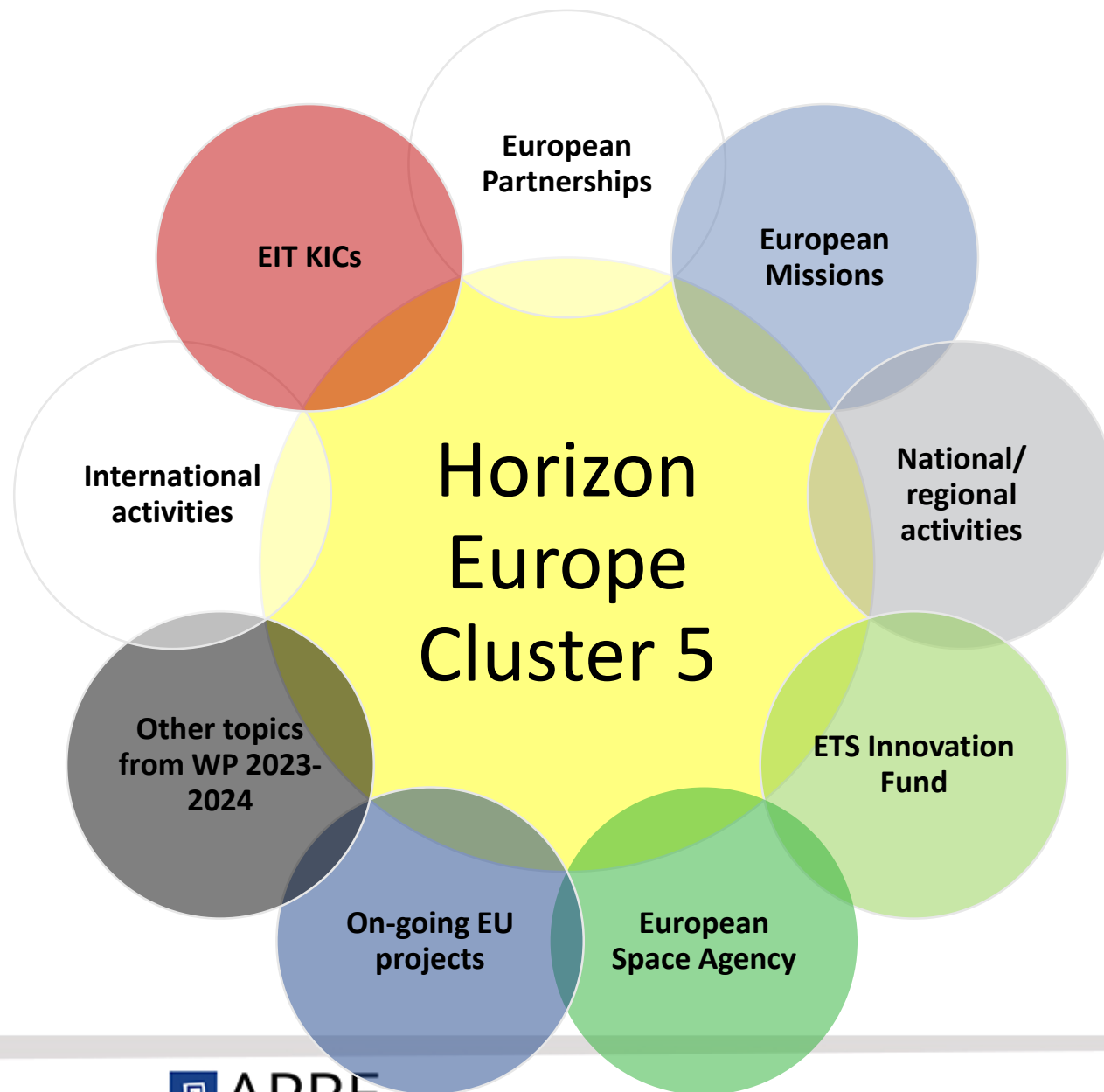
- Concentrated Solar Power (CSP)
- Photovoltaics (PV)
- Solar Heat & Power

In total 14 topics for a total budget of 151 M€

+ Activities of the Clean Hydrogen Joint Undertaking

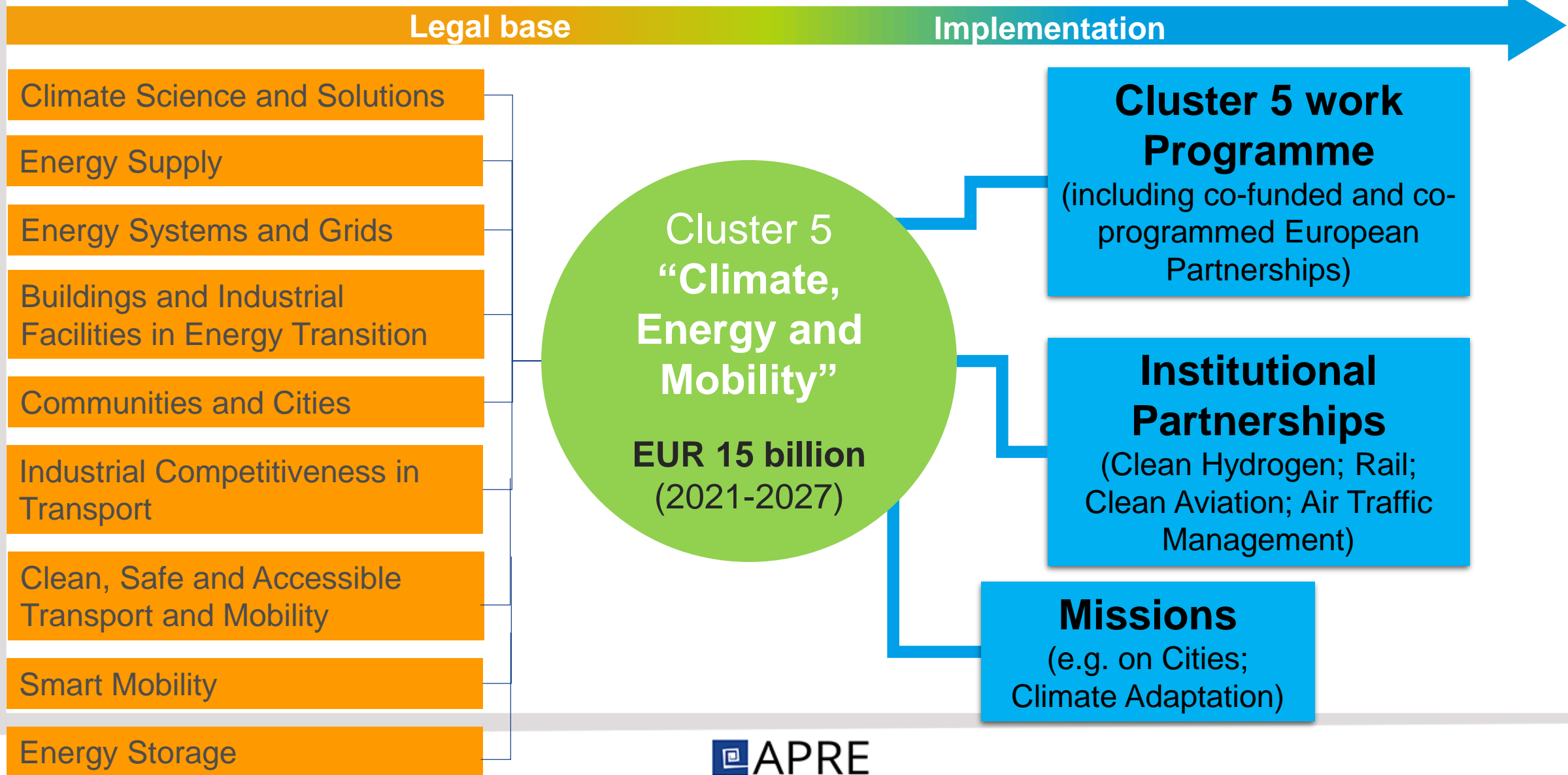
Fostering synergies

Around **25% of all topics** with a total budget of some **730 M€** (~30% of the total budget) refer explicitly to “synergies”





Cluster 5 - overview





Cluster 5 European Partnerships

INSTITUTIONAL

Transforming Europe's rail system

(0.6 bn€ EU contribution;
0.6 bn€ private contributions)

Integrated Air Traffic Management

(0.6 bn€ EU contribution; 0.5 bn€ private
contributions; 0.5 bn€ from Eurocontrol)

Clean Aviation

(1.7 bn€ EU contribution;
2.4 bn€ private contributions)

Clean Hydrogen

(1.0 bn€ EU contribution;
1.0 bn€ private contributions)

Total: 3.9 bn€ EU contribution

CO-FUNDED

CET | Clean Energy Transition

(210 M€ EU
contribution)

DUT | Driving urban transitions to a sustainable future

(130 M€ EU
contribution)

Total: 0.34 bn€ EU contribution

CO-PROGRAMMED

Built4People | People-centric sustainable built environment

(380 M€ EU contribution; 400 M€ private contributions)

ZEWT | Zero-emission waterborne transport

(530M€ EU contribution; 3300 M€ private contributions)

CCAM | Connected, Cooperative and Automated Mobility

(500 M€ EU contribution; 500 M€ private contributions)

2ZERO | Towards zero-emission road transport

(615 M€ EU contribution; 615 M€ private contributions)

Batt4EU | Towards a competitive European industrial battery value chain

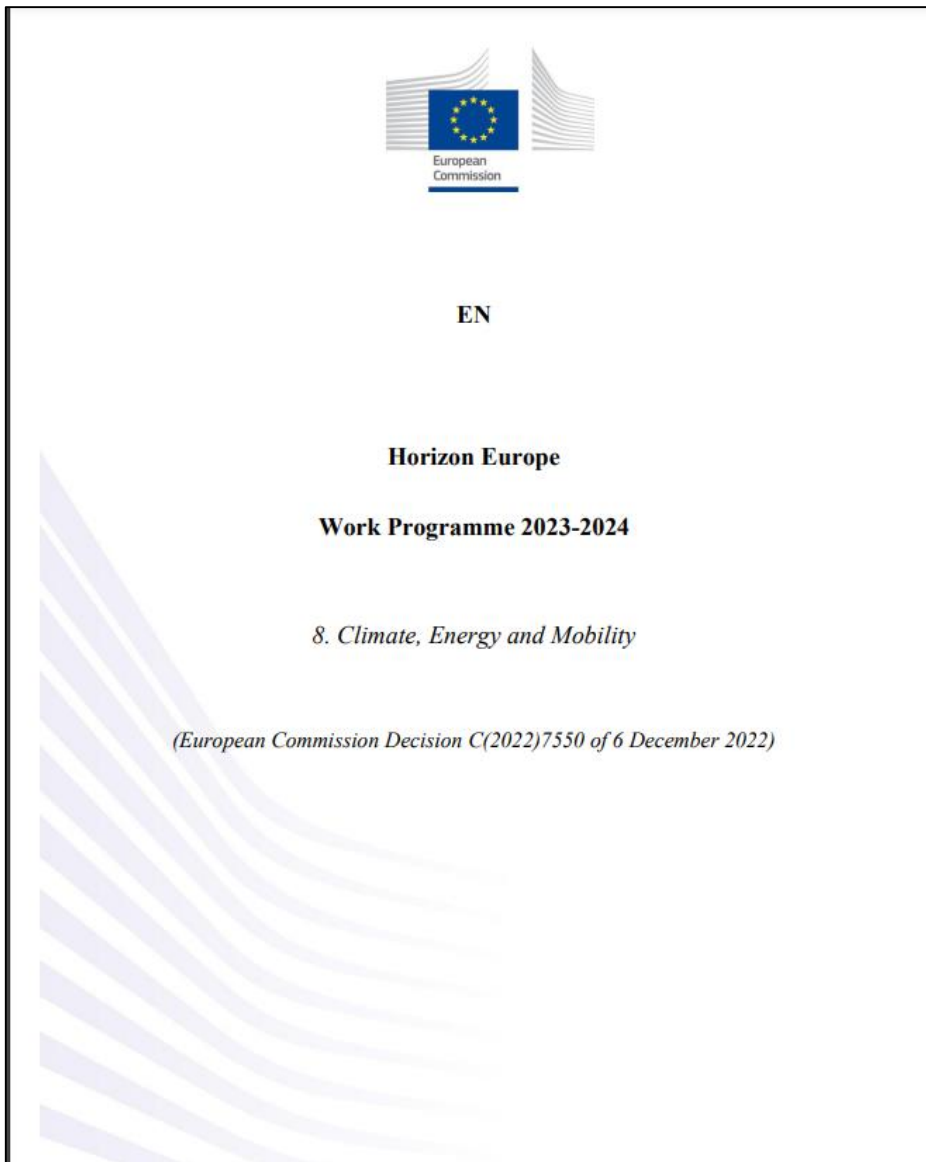
(925 M€ EU contribution; 925 M€ private contributions)

Total: 2.95 bn€ EU contribution

Total: 7.2 bn€



The Work Programme 23-24

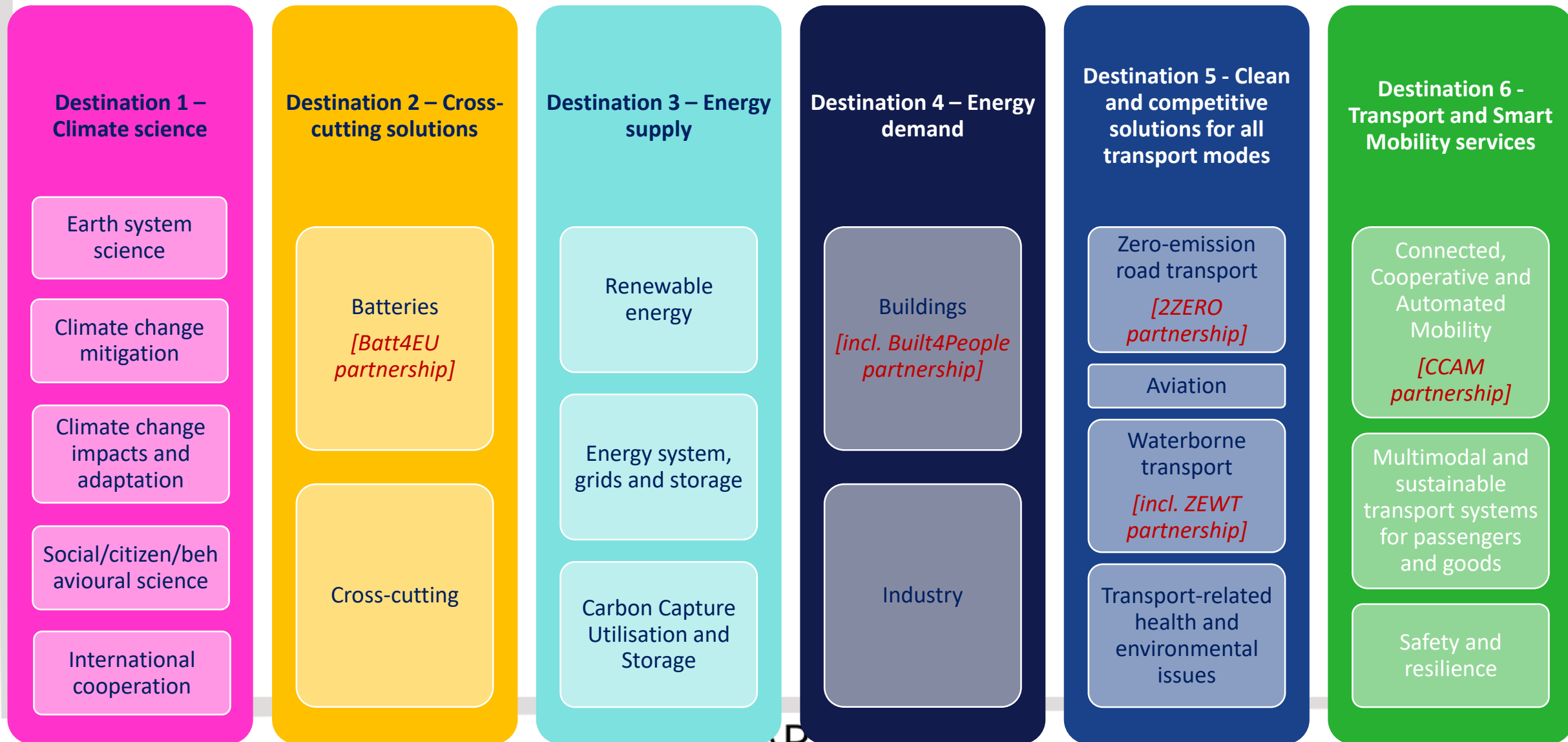


The Work Programme (WP) is

- 🔗 a document downloadable from the European Commission Funding and Tender Opportunities Portal:
<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/reference-documents;programCode=HORIZON>
- 🔗 Including all the calls for proposals open in a given time [the current WP covers 2023-24]



Cluster 5 Work programme - overview





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

Objectives

- **Advancing knowledge and providing solutions** in 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.
- Contributing substantially to key **international assessments** such as those of the Intergovernmental Panel on Climate Change (IPCC) or the European Environment Agency (e.g. European environment state and outlook reports, SOER).
- Strengthening the **European Research Area** on climate change.
- Increasing the **transparency, robustness, trustworthiness and practical usability** of the knowledge base on climate change for use by policy makers, practitioners, other stakeholders and citizens.

Issues covered in topics

- Earth system science and Earth System Model data, tipping points, Climate impacts of a hydrogen economy; climate eco-system interactions, cloud-aerosol interaction; voluntary climate change mitigation initiatives; policy; Modelling for local adaptation assessments and plans, solar radiation modification, social sciences to tackle climate change, international cooperation



FOCUS TOPIC

HORIZON-CL5-2024-D1-01-04: Improved toolbox for evaluating the climate and environmental impacts of trade policies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p>





FOCUS TOPIC

HORIZON-CL5-2024-D1-01-04: Improved toolbox for evaluating the climate and environmental impacts of trade policies

Expected Outcome

Project results are expected to contribute to all of the following outcomes:

- Enhance our knowledge and inform policy makers on the positive and negative impacts of trade and trade policy on the climate. Additionally, where relevant, broader effects on the environment, in particular biodiversity, pollution and natural resources depletion may also be considered.
- Improve and enlarge the toolbox of models and other research techniques as well as available data and its processing to analyse the impact of trade and trade policy on the climate.



FOCUS TOPIC

HORIZON-CL5-2024-D1-01-04: Improved toolbox for evaluating the climate and environmental impacts of trade policies

Scope: Actions are expected to cover **all of the** following areas:

- **Study and quantification of the effects of trade on the climate and the environment**

- In-depth study/quantification of the technique and composition effects: in addition to the scale effect of increasing production, trade also has an impact on the sector composition of economies and the technologies used for production. The project(s) should quantify and decompose these effects, including their underlying mechanisms/causes.
- Growth projections of trade related emissions in developing countries and newly developed countries: it can be expected that most of future trade-related emissions will take place in these countries. The project(s) should therefore estimate and quantify these future emissions under different scenarios, including the extent to which this is related to pollution offshoring and pollution haven effects.
- Estimate the net effect of trade: clarify/quantify how much of trade related emissions would still take place in the context of the domestic economy without international trade. While trade-related emissions are an important part of total world emissions, not enough is known about the counterfactual, i.e. emissions profiles in the absence of international trade.
- Study the effects stemming from changes in the use of resources attributable to international trade, both in terms of efficiency gains (e.g. in energy and material use) and in terms of changes in the climate impacts associated with production and consumption, and whether externalities are likely to be internalised. For specific sectors, the action should look into emissions linked to the production in different countries versus transport emissions in trade to those countries.
- Study trade-related climate and environmental impacts in key sectors like agriculture and livestock, including linkages to regional land use change, water resources and differences in agricultural production techniques worldwide. Specific tools and methodologies for agriculture and livestock should also be proposed and refined to be able to give sector-specific advice to policy makers.
- Study the public perception vs. the reality of trade impacting on the environment and climate: while in the public debate trade is often associated with increased emissions related to the scale effect, technique and composition effects point to positive impacts in certain cases. Case studies should also include concrete examples of cases where public perception of trade effects on emissions and real effects diverge.



FOCUS TOPIC

HORIZON-CL5-2024-D1-01-04: Improved toolbox for evaluating the climate and environmental impacts of trade policies

- **Study and quantification of the effects of trade policy on the climate and the environment**
 - In-depth study/quantification of trade creation and trade diversion effects in relation to the climate and the environment: trade liberalisation affects trade flows through the diversion of such flows as well as inducing additional trade. The project(s) should study the net effect of these phenomena on the climate and the environment.
 - Impact of environmental/climate regulation on trade and competitiveness: it can be assumed that in some cases tightened environmental legislation can lead to compliance costs and competitiveness effects. It should be empirically studied to what extent this assumption is correct and to what extent the so-called 'Brussels Effects' impacts these cost and competitiveness effects.
 - What do the expansion of global value chains, offshoring and their fragmentation (and a possible reversal of such trends) mean for the climate and climate-related trade policy: the project(s) should analyse the effectiveness of climate and trade policies in such an international economic context.
 - Effects of openness to trade on environmental and climate policy: trade and international exchanges lead to the diffusion of technology and ideas. To what extent do these effects influence emissions and global climate/environmental policies?
 - The role of trade policy as a tool to address the free rider problems in climate policies: since addressing climate change is a global public good, free-rider problems persist. To what extent can trade incentives and the trade policy toolbox help overcoming these?
 - Analyse the coherence between trade policies, climate policies and other policies such as nutrition-food, resources policies and development policies that affect the impacts on the climate and the environment. Analyse how these policies affect the trade-off between food security and conservation of natural resources (such as forests and water resources).



FOCUS TOPIC

HORIZON-CL5-2024-D1-01-04: Improved toolbox for evaluating the climate and environmental impacts of trade policies

Methodology and toolbox related aspects

- Impact of trade and foreign direct investment (FDI) on the productivity of sectors (do more productive sectors/producers tend to be cleaner?): the project(s) should endogenise (Global Trade Analysis Project (GTAP) sector productivity to trade beyond a Melitz-type of framework, including the separation of energy efficiency effects among the productivity effects. Currently since, technological change is mostly exogenous or only roughly calibrated in Computable General Equilibrium (CGE) models, technique effects on carbon leakage cannot fully be captured.
 - Impact of trade on land use (overall and composition), in particular on deforestation: the project(s) should study methodologies that can be used to better understand the effects of trade and trade policy on land use. Actions should also create/update a trade induced land use/land use change matrix for GTAP sectors.
 - Transport-related pollution: the project(s) should create a transport mode matrix for GTAP sectors per countries and their related emissions.
 - Enlarge/split the GTAP sectors list for emission-intensive sectors: the project(s) should create/improve the GTAP sector matrix for emission-intensive sectors.
- 🔗 Actions are also encouraged to explore and promote synergies between the use of modelling approaches in international trade analysis and in comparable macroeconomic modelling in climate policy, for example, in Integrated Assessment Modelling.
- 🔗 International cooperation with research clusters, which have specific knowledge in areas of this call, is encouraged.
- 🔗 The project should also include dissemination and capacity-building for the findings and tools created among policy makers at the EU and Member States/Associated countries level.



Destination 2 - Cross-sectoral solutions for the climate transition

Batteries (Batt4EU Partnership)

- Supporting creation of a **competitive, circular, and sustainable European battery manufacturing value chain**
- Improvement of **technological performance** to increase application user attractiveness
- **Issues:** material processing, advanced materials, manufacturing processes, battery systems, recycling technologies, coordination activities
- Implementing **Batteries** co-programmed **Partnership**

Emerging breakthrough technologies and climate solutions

- Issues: Emerging energy technologies for a climate neutral Europe, Demonstration of knowledge and scientific proofs of the technological feasibility of concepts on high risk/high return (i.e. high technological and economic risks) technologies for transition to climate neutral economy by 2050 and beyond



Destination 3 - Sustainable, secure and competitive energy supply

Renewable energy

- Fostering **European global leadership** in affordable, secure and sustainable renewable energy technologies and services by improving their **competitiveness** in global **value chains** and their position in growth markets, notably through the **diversification** of the renewable services and technology portfolio
- **Issues:** PV, wind energy and heat pumps; Renewable fuels; decreasing the EU's dependence on fossil fuels; disruptive technologies, cost reduction, improved efficiency, de-risking, integration, export potential, sustainability, market uptake

Energy system, grids and storage

- Ensuring cost-effective **uninterrupted** and **affordable** supply of energy to households and industries in a scenario of **high penetration of variable renewables** and other new low carbon energy supply.
- Managing smart and cyber-secure **energy grids** and optimisation the interaction between producers, consumers, networks, infrastructures and vectors
- **Issues:** energy sector integration, energy system planning and operation, active consumer, markets and energy communities, digitization

Carbon Capture, Utilization and Storage

- **Accelerating** the development of Carbon Capture, Use and Storage (CCUS) as a CO₂ emission mitigation option in **electricity generation** and **industry applications** (including also conversion of CO₂ to products)
- **Issues:** CCUS hubs, application in industry, CO₂ capture



Destination 4 - Efficient, sustainable and inclusive energy use

Buildings

- **Technological and socio-economic breakthroughs** for achieving climate neutrality and the transition to zero pollution of the building stock by 2050, based on **inclusive and people-centric R&I**
- **Issues:** Energy performance assessment and monitoring, industrialization of deep renovation, integrated technology solutions, prefabricated renovation packages, demand response, renewable intensive homes, smart buildings, design, materials, sustainability of life-cycle
- Implementing co-programmed **Partnership “People-centric, Sustainable Built Environment”** (Built4People)

Industry

- Increased energy efficiency in industry and **reducing industry’s Greenhouse Gas (GHG) and air pollutant emissions** through recovery, upgrade and/or conversion of industrial excess (waste) heat and through electrification of heat generation
- **Issues:** heat upgrade technologies, industrial excess (waste) Heat-to-Power conversion, Increasing the efficiency of the cooling systems and reducing costs, coupling the cooling systems with renewable energy sources, and harnessing available industrial waste heat



Destination 5 - Clean and competitive solutions for all transport modes

Zero-emission road transport

- Transforming road transport to **zero-emission mobility** through a world-class European research and innovation and industrial system, ensuring that **Europe remains world leader** in innovation, production and services in relation to road transport
- **Issues:** battery management system, power electronics, optimised smart EV charging, sustainable circularity, two-wheelers, microbuses
- Implementing **co-programmed Partnership** “Towards zero emission road transport” (2ZERO)

Aviation

- Accelerating the **reduction of all aviation impacts and emissions** (CO₂ and non-CO₂, including manufacturing and end-of-life, noise), developing aircraft technologies for deep reduction of greenhouse gas emissions, and **maintaining European aero-industry’s global leadership** position
- **Issues:** long-term research, hydrogen-powered/electrified aviation, digital aviation technologies, policy-related research

Waterborne transport

- Accelerate the development and prepare the deployment of **climate neutral and clean solutions** in the shipping sector, **reduce its environmental impact** (on biodiversity, noise, pollution and waste management), improve its **system efficiency**, leverage digital and EU satellite-navigation solutions and contribute to the **competitiveness** of the European waterborne sector
- **Issues:** climate neutral fuels, electrification, energy efficiency and drastically lower fuel consumption of vessels, port infrastructure, inland waterway vessels, automated shipping
- Implementing **co-programmed Partnership** “Zero Emission Waterborne Transport” (ZEWT)

Transport - Health and environment

- Devising more effective ways for **reducing emissions and their impacts** through improved scientific knowledge
- **Issues:** monitoring polluting emissions, noise and particle emissions, smog prevention



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

Connected, cooperative and automated mobility

- Accelerating the implementation of innovative connected, cooperative and automated mobility (CCAM) technologies and systems for **passengers and goods**
- **2023: 5 topics** (50 M€)
- **Issues:** on-board perception and decision-making technologies, safety validation, Physical and Digital Infrastructure, cyber-security, socio-economic and environmental impacts, coordination, demonstrators, occupant protection, Human behavioural model, fleet and traffic management systems, Artificial Intelligence
- Implementing **co-programmed Partnership** “Connected, Cooperative and Automated Mobility” (CCAM).

Multimodal and sustainable transport systems

- Further developing a **multimodal transport system** through sustainable and smart long-haul and urban freight transport and **logistics**, upgraded and resilient physical and digital **infrastructures** for smarter vehicles and operations, for optimised system-wide **network efficiency**
- **2023: 4 topics** (31 M€)
- **Issues:** multimodal freight transport nodes, greening the last mile, transport infrastructure (inland waterways), logistics networks integration and harmonisation, urban logistics and planning, smart enforcement, mobility services for the next decade, multimodal network and traffic management, construct, maintain and decommission transport infrastructure, resilient freight transport and logistics networks

Safety and resilience

- Drastically decreasing the number of **transport accidents, incidents and fatalities** towards the EU’s long-term goal of moving close to zero fatalities and serious injuries by 2050 even in road transportation (Vision Zero) and increase the **resilience** of transport systems
- **2023: 3 topics** (26.5 M€)
- **Issues:** safe lightweight vehicles, human-technology interaction, road safety in low and medium income countries in Africa, infection on large passenger ships, safe automation and human factors in aviation, vulnerable road users, resilient aircraft and increased survivability, containership fires



GREENET

The CL5 NCPs Network

GREENET in a nutshell

- Funded by Horizon Europe
- Launched on the 1st July 2022
- Closing in 2027
- The **aim** is to improve the professionalisation of the CL5 NCPs across Europe, **simplifying applicants' access to Horizon Europe calls and raising the average quality of submitted proposals:**
 - Raising the general standard of support to applicants by **enhancing the competences of the Cluster 5 NCPs.**
 - **Raising applicants' awareness on HE funding opportunities as well as their knowledge** by the provision of a **suite of tools** to better tackle the challenges posed by the CL5 of HE.
 - **Lowering the entry barriers** for newcomers and participants from widening countries.
 - Increasing the quality and inclusiveness of international consortiums **supporting matchmaking among the CL5 applicants.**



GREENET- The network of CL5 NCPs

TOOLBOX

Infographics, Guides & factsheets, videos

PARTNER SEARCH SYSTEM

Organisations' profiles' database for consortia preparation

STAKEHOLDER DIRECTORY

This tool should enable you to identify what the roles of the different R&I CL5-related organisations are and which are the ones that you should be engaging with.

EUROPEAN CL5 DOCUMENT REPOSITORY

Repository of roadmaps, strategies, white papers, position papers published by relevant organisations/associations/platforms from the CL5-related sectors

WORK IN PROGRESS



CONTACTS



GREENET



@NCP_GREENET



<https://horizoneuropencppportal.eu/cluster-5>





Next events

Horizon Europe info day - Cluster 5

COMING SOON

Horizon Europe info day - Cluster 5

Focusing on the twin green and digital transitions to achieve climate neutrality in Europe by 2050

 17 October 2023

 10:00 (GMT+02:00)

45 members are attending this event

Log in

Register now

Overview Programme

Invite 

I'm interested 

Share this event on:

 Twitter

 Facebook

 LinkedIn

 Copy link

Registration open: <https://research-innovation-community.ec.europa.eu/events/4MjD45QEP6eLsP9j3MCEOc/o>



#ECcluster5infoday2024

18 October 2023

GREENET Brokerage Event for HE Cluster 5 - 2024 calls

GREENET Brokerage Event

Horizon Europe Cluster 5 calls for proposals 2024

18TH OCTOBER 2023



HORIZON
EUROPE



THE EU RESEARCH & INNOVATION
PROGRAMME 2021 - 2027

#HorizonEU



Registration open: <https://greenet-brokerage-event-2024.b2match.io/>





Agenzia per la Promozione
della Ricerca Europea

Email: segreteria@apre.it

Tel. +39 06 48 93 9993

www.apre.it



Cluster 5 National Contact Points

cluster5@apre.it