



APRE

Agenzia per la Promozione
della Ricerca Europea

Overview of Horizon Europe opportunities

15/06/2021

Miriam de Angelis

APRE



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



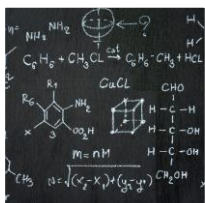
What is Horizon
Europe?



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, competitiveness and jobs



HE Rules for Participation



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

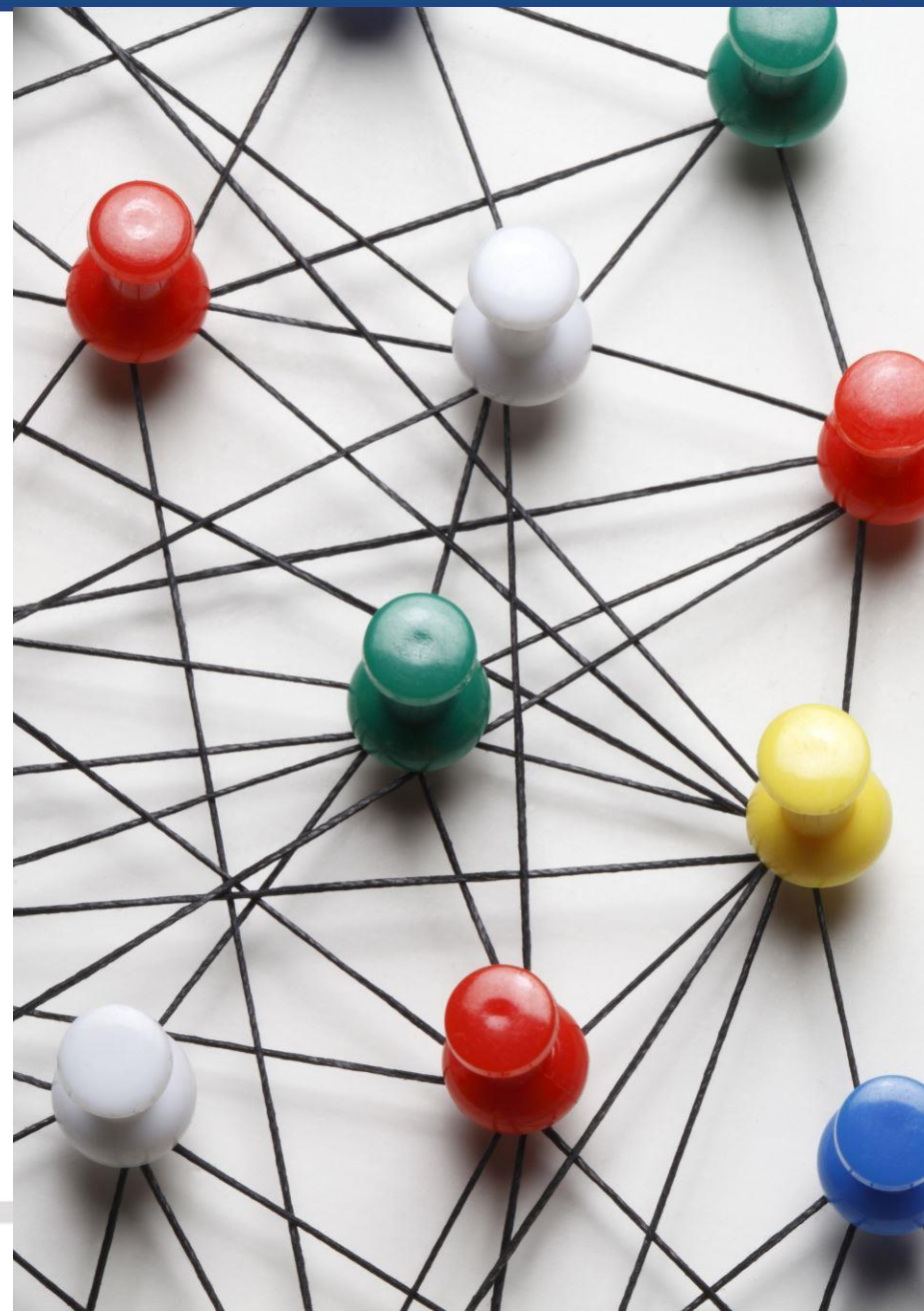


Minimum requirements

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 the work programme provides otherwise”

SPECIAL/ADDITIONAL CONDITIONS

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





HE Structure

HORIZON EUROPE

EURATOM

SPECIFIC PROGRAMME: EUROPEAN DEFENCE FUND

Exclusive focus on defence research & development

Research actions

Development actions

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*

Exclusive focus on civil applications

**Pillar I
EXCELLENT SCIENCE**



European Research Council

Marie Skłodowska-Curie

Research Infrastructures

**Pillar II
GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS**



Clusters

- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- **Climate, Energy & Mobility**
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre

**Pillar III
INNOVATIVE EUROPE**



European Innovation Council

European Innovation Ecosystems

European Institute of Innovation & Technology*

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

Widening participation & spreading excellence Reforming & Enhancing the European R&I system

Fusion

Fission

Joint Research Center

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



Cluster 5 - overview

Legal base

Implementation

Climate Science and Solutions

Energy Supply

Energy Systems and Grids

Buildings and Industrial
Facilities in Energy Transition

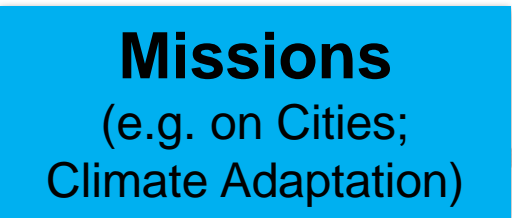
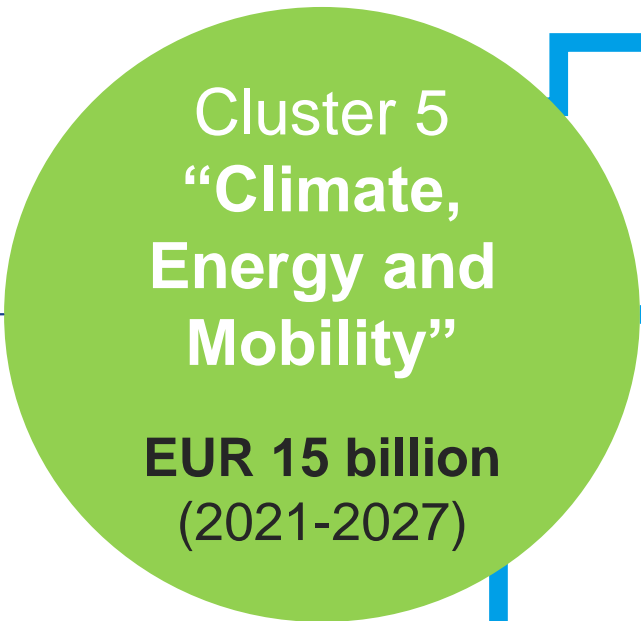
Communities and Cities

Industrial Competitiveness in
Transport

Clean, Safe and Accessible
Transport and Mobility

Smart Mobility

Energy Storage





The Cluster 5 Work Programme



EN

Horizon Europe

Work Programme 2021-2022

8. *Climate, Energy and Mobility*

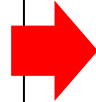
(European Commission Decision C(2021)9128 of 15 December 2021)

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 2021-22]

Table of contents

| | |
|--|----|
| Introduction | 15 |
| Destination – Climate sciences and responses for the transformation towards climate neutrality | 21 |
| Call - Climate sciences and responses | 23 |
| Conditions for the Call | 23 |
| HORIZON-CL5-2021-D1-01-01: Improved understanding of greenhouse gas fluxes and radiative forcers, including carbon dioxide removal technologies | 24 |
| HORIZON-CL5-2021-D1-01-02: Modelling the role of the circular economy for climate change mitigation | 26 |
| HORIZON-CL5-2021-D1-01-03: Maximising the impact and synergy of European climate change research and innovation | 28 |
| HORIZON-CL5-2021-D1-01-04: Enhanced integrated assessment in pursuit of global climate goals | 32 |
| HORIZON-CL5-2021-D1-01-05: Better understanding of the interactions between climate change impacts and risks, mitigation and adaptation options | 34 |
| HORIZON-CL5-2021-D1-01-06: Supporting and standardising climate services | 37 |
| HORIZON-CL5-2021-D1-01-07: Improved economic methods for decision-making on climate and environmental policies | 39 |
| HORIZON-CL5-2021-D1-01-08: Restoration of natural wetlands, peatlands and floodplains as a strategy for fast mitigation benefits; pathways, trade-offs and co-benefits | 41 |
| HORIZON-CL5-2021-D1-01-09: The contribution of forest management to climate action: pathways, trade-offs and co-benefits | 43 |
| Call - Climate sciences and responses | 45 |
| Conditions for the Call | 46 |
| HORIZON-CL5-2022-D1-01-01-two-stage: Carbon Dioxide Removal (CDR) approaches | 47 |
| HORIZON-CL5-2022-D1-01-02-two-stage: Socio-economic risks of climate change in Europe | 49 |
| HORIZON-CL5-2022-D1-01-03-two-stage: Social science for land-use strategies in the context of climate change and biodiversity challenges | 52 |
| Call - Climate sciences and responses | 54 |



| | |
|---|-----|
| HORIZON-CL5-2022-D1-02-03: Improvement of Integrated Assessment Models in support of climate policies | 60 |
| HORIZON-CL5-2022-D1-02-04: Supporting the formulation of adaptation strategies through improved climate predictions in Europe and beyond | 63 |
| HORIZON-CL5-2022-D1-02-05: Let nature help do the job: Rewilding landscapes for carbon sequestration, climate adaptation and biodiversity support | 65 |
| Destination – Cross-sectoral solutions for the climate transition | 69 |
| Call - Cross-sectoral solutions for the climate transition | 73 |
| Conditions for the Call | 73 |
| A competitive and sustainable European battery value chain | 74 |
| HORIZON-CL5-2021-D2-01-01: Sustainable processing, refining and recycling of raw materials (Batteries Partnership) | 75 |
| HORIZON-CL5-2021-D2-01-02: Advanced high-performance Generation 3b (high capacity / high voltage) Li-ion batteries supporting electro mobility and other applications (Batteries Partnership) | 77 |
| HORIZON-CL5-2021-D2-01-03: Advanced high-performance Generation 4a, 4b (solid-state) Li-ion batteries supporting electro mobility and other applications (Batteries Partnership) | 79 |
| HORIZON-CL5-2021-D2-01-04: Environmentally sustainable processing techniques applied to large scale electrode and cell component manufacturing for Li ion batteries (Batteries Partnership) | 81 |
| HORIZON-CL5-2021-D2-01-05: Manufacturing technology development for solid-state batteries (SSB, Generations 4a - 4b batteries) (Batteries Partnership) | 83 |
| HORIZON-CL5-2021-D2-01-06: Sustainable, safe and efficient recycling processes (Batteries Partnership) | 85 |
| HORIZON-CL5-2021-D2-01-07: Support for establishment of R&I ecosystem, developing strategic forward-looking orientations to ensure future skills development, knowledge and technological leadership for accelerated disruptive technology exploration and uptake (Batteries Partnership) | 87 |
| Emerging breakthrough technologies and climate solutions | 89 |
| HORIZON-CL5-2021-D2-01-08: Emerging technologies for a climate neutral Europe | 89 |
| HORIZON-CL5-2021-D2-01-09: Methane cracking to usable hydrogen and carbon | 91 |
| HORIZON-CL5-2021-D2-01-10: Technologies for non- CO2 greenhouse gases removal | 92 |
| HORIZON-CL5-2021-D2-01-11: Direct atmospheric carbon capture and conversion | 93 |
| Citizens and stakeholder engagement | 95 |
| HORIZON-CL5-2021-D2-01-12: Fostering a just transition in Europe | 95 |
| HORIZON-CL5-2021-D2-01-13: Strengthening Social Sciences and Humanities (SSH) energy and mobility disciplines | 97 |
| Accelerating the climate transition in difficult contexts: | 99 |
| Fostering cooperation between Horizon Europe cluster 5 | 100 |

- Destinations are groups of Calls for proposals
- Calls for proposals are groups of Topics

HORIZON-CL6-2021-BIODIV-01-13: Breeding for resilience: focus on root-based traits

| Specific conditions | |
|---|--|
| <i>Expected EU contribution per project</i> | The Commission estimates that an EU contribution of around EUR 8.00 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 16.00 million. |
| <i>Type of Action</i> | Research and Innovation Actions |

Expected Outcome: In line with the objectives of the biodiversity and farm to fork strategies, a successful proposal will support the transition to more sustainable practices in agriculture by reducing the need for external inputs and supporting biodiversity in agroecosystems.

The project results are expected to contribute to all of the following expected outcomes:

- A better understanding of root-based traits (including the capacity to establish beneficial interactions with soil biota) and their genotypic variability as well as increased insight into the (adaptive) phenotypic plasticity of roots;
- Enhanced capacities for root phenotyping under controlled and on-field conditions;
- The delivery of strategies for breeding for below-ground traits capitalising on more effective interactions between plants and microorganisms in the rhizosphere;
- An increased use and valorisation of genetic resources (in situ and ex situ) for root based traits.

On the longer term projects will contribute to: the development of crops (annual and perennial) and forest trees that are more tolerant to abiotic stress conditions, require less external inputs (e.g. fertilisers and pesticides) and show an increased capacity for carbon sequestration, thereby contributing to adaptation of agriculture and forestry to climate change.

Scope: With increasing effects of climate change and a shift towards low(er) input production systems, there is the need for crops that are capable of capturing resources more efficiently and are resilient to abiotic stresses.

The root system and its interaction with soil biota is crucial for nutrient and water acquisition as well as for the capacity of plants to adapt to changing environments and to be more tolerant against pests and diseases. Phenotypic plasticity is key for plants to respond to varying soil conditions and highly dynamic distribution of soil resources. The size and architecture of the root system also determine the allocation of carbon in the soil. Breeding for root traits is therefore a promising strategy to increase plant stress resilience while also enhancing soil carbon sequestration.

Proposals should:

- Identify root traits that increase resource efficiency of plants in different environments, taking into account beneficial plant – microbe interactions and the restitution of plant-fixed carbon to the soil;
- Increase our knowledge on the (molecular and biochemical) plasticity of root responses and their metabolic mechanisms to environmental cues;
- Improve existing and/or develop new root phenotyping tools (including image analysis protocols) to be used in controlled and on-field conditions, thereby overcoming the root data bottleneck;
- Develop strategies to implement “root breeding”, i.e. select for desirable root characteristics and exploit the genetic variation in root traits.

Activities should be carried out in a range of agronomically relevant soil conditions.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Topic title

Type of Action

Specifies what kind of activities are to be performed

Expected outcomes

specifies the positive effects generated by the actions

Scope

specifies the focus and the boundaries of the potential action



Main types of action (Eligible activities)

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

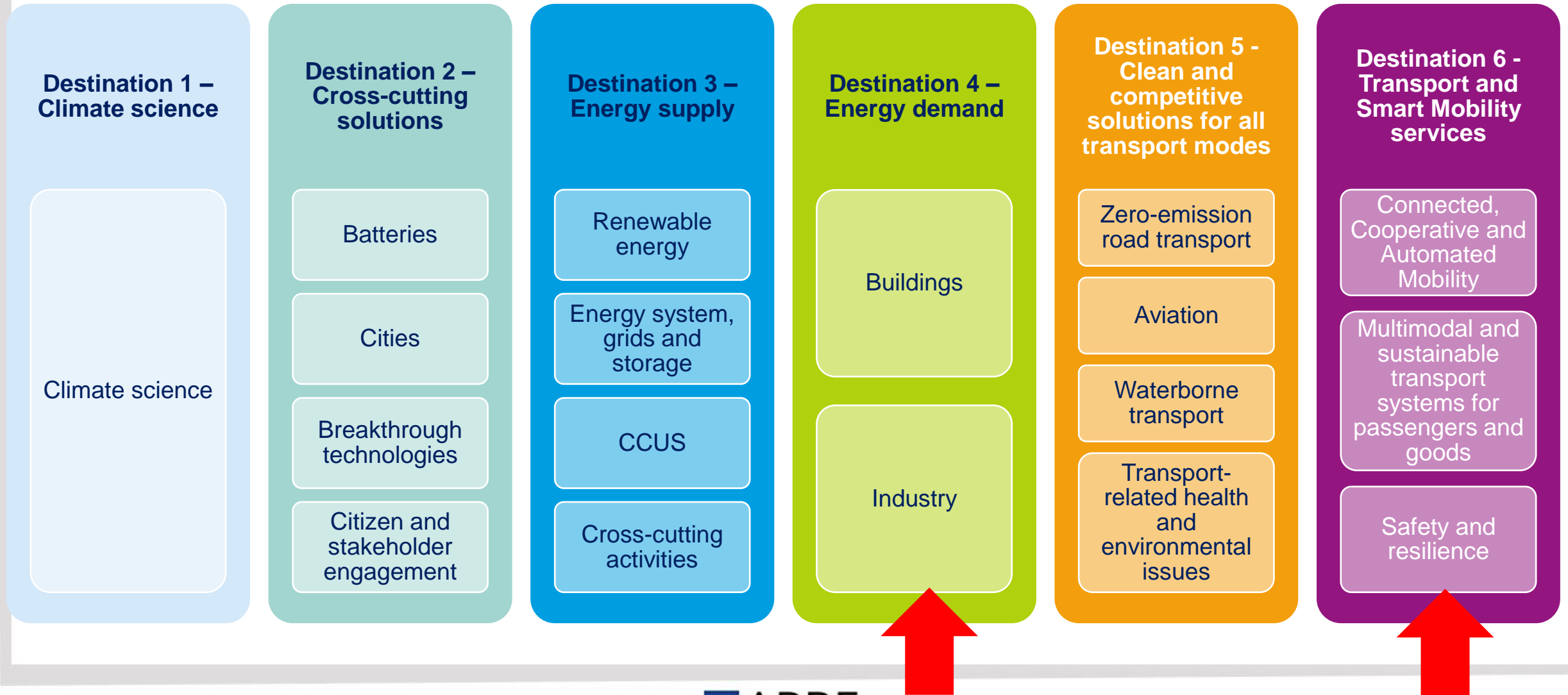


Open Funding opportunities

in Cluster 5



CL5 WP - Destination





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**
- **10 topics in 2022** (140 M€)
- **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
- **2 topics in 2022** (18 M€)
- **Issues:** heat upgrade technologies, industrial excess (waste) Heat-to-Power conversion



Topics of interest

| TOPIC CODE | TOPIC TITLE | OPENING DATE | DEADLINE | BUDGET PER GRANT Mil € | Number of projects expected to be funded |
|---------------------------|--|--------------|------------|---------------------------|--|
| HORIZON-CL5-2022-D4-01-01 | Demand response in energy-efficient residential buildings | 28/04/2022 | 06/09/2022 | 4 to 6 | 2 |
| HORIZON-CL5-2022-D4-01-02 | Renewable-intensive, energy positive homes | 28/04/2022 | 06/09/2022 | 4 to 6 | 2 |
| HORIZON-CL5-2022-D4-01-03 | Smarter buildings for better energy performance | 28/04/2022 | 06/09/2022 | 4 to 6 | 2 |
| HORIZON-CL5-2022-D4-02-01 | Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People) | 06/09/2022 | 24/01/2023 | 5 to 7 | 2 |
| HORIZON-CL5-2022-D4-02-02 | Solutions for the sustainable, resilient, inclusive and accessible regeneration of neighbourhoods enabling low carbon footprint lifestyles and businesses (Built4People) | 06/09/2022 | 24/01/2023 | 5 to 7.5 | 2 |
| HORIZON-CL5-2022-D4-02-03 | Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-emission cultural heritage: prevention, monitoring, management, maintenance, and renovation (Built4People) | 06/09/2022 | 24/01/2023 | 4 to 5 | 4 |
| HORIZON-CL5-2022-D4-02-04 | Smart-grid ready and smart-network ready buildings, acting as active utility nodes (Built4People) | 06/09/2022 | 24/01/2023 | 6 to 9.5 | 2 |
| HORIZON-CL5-2022-D4-02-05 | More sustainable buildings with reduced embodied energy / carbon, high life-cycle performance and reduced life-cycle costs (Built4People) | 06/09/2022 | 24/01/2023 | 6 to 9.5 | 2 |



HORIZON-CL5-2022-D4-01-01 Demand response in energy-efficient residential buildings

Scope: Address the potential of the residential sector for **Demand Response** (as a measure for reducing energy load in response to supply constraints, e.g. during periods of peak demand) with a view to support the energy transition at system level while respecting user privacy, comfort and ownership:

- Investigate innovative demand response solutions for the residential sector, including new control modes and asset optimisation techniques involving as many devices as possible.
- comply with the principle of privacy by design and with best practices on data protection.
- minimise the effort required to elicit user preferences, also investigating innovative approaches for user segmentation and engagement.
- Take due account the regulatory frameworks of the regions / countries in which the proposed solutions could be deployed
- Seek to the best consideration of social and economic enablers in the design of the innovative solutions.
- Demonstrate that the proposed solutions lead to reducing costs of small demand response
- Demonstrate that the proposed solutions are suitable for explicit demand response, or a combination of both explicit and implicit residential demand response.

Keywords: New control modes; privacy by design; data protection; elicit user preferences; regulatory frameworks; social and economic enablers; social innovation and citizen engagement.

Other elements: At least **three demonstration sites** located in different climatic regions

Type of action: Innovation Action

Technology Readiness Level: TRL 6-7 by the end of the project



Relevant initiative

- BRIDGE is a cooperation group involving 90 projects (58 ongoing) in the areas of Smart Grid, Energy Storage, Islands, and Digitalisation funded under the Horizon 2020 program over the last 6 years (2014-2020).
- BRIDGE wants to provide field experience, feedback and lessons learned from the participating projects to help overcome the barriers to effective innovation.
- It aims at gathering recommendations to maximize their impacts towards policy makers in view of removing barriers to innovation deployment.

| | TSO-DSO Cooperation | Energy Islands | Advanced tools | DC | Demand Response | Islands |
|-------------|---|---|--|---|---|---|
| 2020 - 2021 | 2020: 1 project, 22 M€  | 2020: 3 project, 17 M€   2021: 2 project, 11 M€   | 2020: 2 project, 8 M€  FlexPlan | 2020: 2 project, 14 M€   | 2020: 7 project, 56 M€        | 2020: 5 project, 36 M€      |



1.2 BRIDGE Working Groups

This cooperation group involves four different types of activities (Working Groups) addressing cross-cutting issues enlisted as follows:

Data Management

- **Communication Infrastructure**, embracing the technical and non-technical aspects of the communication infrastructure needed to exchange data and the related requirements
- **Cybersecurity and Data Privacy**, entailing data integrity, customer privacy and protection
- **Data Handling**, including the framework for data exchange and related roles and responsibilities, together with the technical issues supporting the exchange of data in a secure and interoperable manner, and the data analytics techniques for data processing.

Consumer and Citizen Engagement

- Segmenting, analysis of cultural, geographical and social dimensions,
- Value systems - Understanding Consumers
- Drivers for Engagement
- Effectiveness of Engagement Activities
- Identification of what triggers behavioural changes (e.g., via incentives)
- The Regulatory Innovation to Empower Consumers

Regulation

Regulatory aspects concerning integration and harmonisation aspects of market design:

- Harmonisation at the level of products and services, including the role of energy communities as service provider.
- Cross-border and regional cooperation.
- Integration of market -based and non-market-based flexibility mechanisms.
- Coordinated flexibility markets for system services.

Business Models

- Defining common language and frameworks around **business model description and valuation**
- Identifying and evaluating **existing and new or innovative business models** from the project demonstrations or use cases



HORIZON-CL5-2022-D4-01-02 Renewable-intensive, energy positive homes

Scope: The aim is to move beyond NZEB (nearly zero-energy buildings) for new constructions and to the extent possible, for renovations, and to streamline energy positive buildings, ensuring buildings can marry high energy performance with maximum flexibility and adaptability to a changing society in a cost-effective manner:

- Investigate and demonstrate approaches for the construction of new energy positive residential buildings (and /or the renovation of existing residential buildings), with a focus on multi-family, multi-storey buildings.
- Ensure that the cost of such buildings/apartments does not increase substantially compared to current local / regional practises.
- The demonstrations are expected to span a continuous interval of at least twelve months and to ensure measurement of (as-built) building performances. The relevant building professionals (e.g. architects, installers, workers, craftsmen, building managers) should be involved.
- Projects are expected to assess the sustainability of the proposed solutions in environmental, social and economic terms, considering among others the embodied carbon emissions from materials. The reuse and recycling of elements, components and materials of the proposed solutions at the end of life should be ensured.

Keywords: energy positive home; residential building; renovation of residential building; multi-family/multi-storey; integrated design and construction concepts and processes; affordable, high performance construction products; integration of energy production; smart management technologies; involvement of building professionals; social and economic sustainability.

Other elements: At least three demonstration sites located in different climatic regions for at least 12 months

Type of action: Innovation Action

Budget: 12 mln€: expected 2 projects, from 4 to 6 mln€

Technology Readiness Level: TRL 6-7 by the end of the project



Relevant projects



FleXible user-CEntric Energy poSitive houseS



Joanneum Research
Forschungsgesellschaft mbH



VTT Technical
Research Centre of
Finland Ltd



CENER National
Renewable Energy
Centre of Spain



VITO



Suite5



Prospex Institute



Cordium Cvba



Andalusian Energy
Agency - AEA



TRYCSA



ICLEI - Local
Governments for
Sustainability



CGSoft



Urb-atelier



AEE - Institute for
Sustainable
Technologies



BAR
Vermögensverwaltung
s GmbH



MuoviTech



Gebwell Oy



Basso Building
Systems Oy



Tom Allen Senera Oy



DualSun



Thomas Schwarzl IT



NETxAutomation
Software GmbH



Relevant projects

ARV



- ❏ The ARV consortium is composed by 35 partners from 8 countries: <https://greendeal-arv.eu/our-team/>
- ❏ ARV is a H2020 EU-funded project aiming at creating climate positive circular communities in Europe and increasing the building renovation rate in the continent.
- ❏ ARV is working on six large-scale demonstration projects of **climate positive circular communities** (CPCC) in six European cities, showcasing a range of innovations related to the whole value chain of the industry.



HORIZON-CL5-2022-D4-01-03: Smarter buildings for better energy performance

Scope: Improvement and cost-reduction of technologies to predict, assess, monitor and control in real time the energy performance of buildings, including energy efficiency, renewables, storage and their optimisation.

- Develop new or enhance existing solutions for interoperability of systems, including between building automation and control systems (BACS) and other technical building systems and devices (including IoT ones), as well as between buildings and the grid.
- ensure security and privacy by design in buildings.
- reduce costs of systems allowing the integration of energy efficiency, renewables, storage and their optimisation.
- On the basis of the above, demonstrate the potential for energy savings from energy management solutions based on smart technical building systems (predictive controllers, smart thermostats, active sensors, smart lighting, etc.).
- Assess the contribution of proposed solutions to the enhancement of smart readiness of buildings as rated by the smart readiness indicator under Directive 2010/31/EU.
- Demonstrate that the developed solutions are user-friendly and ensure the desired indoor environment quality and user satisfaction.
- Where possible, demonstrate that such solutions can build flexibly on services/products not originally intended for energy management (e.g. a smart home system).
- Seek to ensure from the design phase that the project is developed with a view to integrate its results/deliverables under a digital building logbook.

Keywords: interoperability; BACS; security and privacy by design; energy savings; energy management solutions; smart technical building systems; predictive controllers; smart devices; active sensors; smart readiness of buildings; user-friendliness; user satisfaction; digital building logbook.

Other elements: At least **three demonstration sites** located in different climatic regions. Liaison and synergies with the European Partnership on “People-centric sustainable built environment”

Type of action: Innovation Action

Budget: 12 mln€: expected 2 projects, from 4 to 6 mln€

Technology Readiness Level: TRL 8 by the end of the project



Relevant projects



- SmartBuilt4EU is setting up task forces that investigate the key issues and trends related to smart buildings and identify barriers, challenges and opportunities to support their take up: <https://smartbuilt4eu.eu/>



- Optimizing the Operational Performance of Small & Medium Sized Buildings: <https://www.autodan-project.eu/>



- Self Assessment Towards Optimization of Building Energy: <https://www.sato-project.eu/>



HORIZON-CL5-2022-D4-02-01: Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)

Scope: Deliver innovative designs, materials and solutions to improve resilience and climate proofing of the built environment in a cost-effective and reliable manner.

+ New and existing buildings; broad spectrum of natural risks; natural, easy to manage, evolutive materials against global warming; increased durability, resilience of building and infrastructures, incl. foundations; self-sensing and adaptable materials; social innovation and citizen engagement; interoperable tools for monitoring, detection and response to critical situations; protection of people; self-sustained temporary solutions (e.g. off-grid energy supply, water purification); application also to cultural heritage; cost-effectiveness

Other elements: at least 3 large-scale demonstrations of the solutions in diverse geographical areas, with various environmental, social, and economic condition; clustering with projects from HE Partnerships on “Driving urban transitions”; involvement of SSH experts, institutions; ambitious international outreach strategies

Type of action: Innovation Action, costs as lump sum

Specific conditions: The funding rate is up to 60% of the eligible costs, except for non-profit legal entities, where the funding rate is up to 100% of the total eligible costs.

Budget: 15 mln€: expected 2 projects, from 5 to 7 mln€

Technology Readiness Level: TRL 6-7 by the end of the project



Relevant initiatives



Climate ADAPT

SHARING ADAPTATION
KNOWLEDGE FOR A
CLIMATE-RESILIENT EUROPE

▣ The European Climate Adaptation Platform Climate-ADAPT is a partnership between the European Commission and the [European Environment Agency](https://climate-adapt.eea.europa.eu/eu-adaptation-policy/sector-policies/buildings): <https://climate-adapt.eea.europa.eu/eu-adaptation-policy/sector-policies/buildings>



Search Climate-ADAPT



Help ▾

News

Events

Newsletter

ABOUT ▾

EU POLICY ▾

COUNTRIES, TRANSNATIONAL REGIONS, CITIES ▾

KNOWLEDGE ▾

NETWORKS

Home ▸ [EU adaptation policy](#) ▸ [EU sector policies](#) ▸ **Buildings**

[Key messages](#) | [Impacts and vulnerabilities](#) | [Policy framework](#) | [Improving the knowledge base](#) | [Supporting investment and funding](#) | [Supporting the implementation](#) |

Buildings



Key messages

- Buildings can be vulnerable to climate change – which may impact both structural features of the building and indoor conditions of the building. An inability to properly regulate indoor

Content in Climate-ADAPT database

- » Publications and reports (62)
- » Information portals (26)
- » Indicators (2)
- » Guidance (8)
- » Tools (5)
- » Research and knowledge projects (78)
- » Adaptation options (11)



HORIZON-CL5-2022-D4-02-02: Solutions for the sustainable, resilient, inclusive and accessible regeneration of neighbourhoods enabling low carbon footprint lifestyles and businesses (Built4People)

Scope: Deliver innovative methods and solutions for the regeneration of neighbourhoods, with due consideration of, inter alia, energy efficiency, sustainability, resilience, health, inclusiveness and accessibility, based on participatory planning processes and innovative decision-making procedures and digital applications

+ local sources of raw materials; local energy generation and consumption at district level; optimising energy balancing at local level; micro-grids; demand response; involve all stakeholder groups, incl. elderly, people with disability; energy poverty; where relevant, energy circularity; where relevant, application to cultural heritage buildings; social innovation and digital tools

Other elements: at least 3 large-scale demonstrations of the solutions in diverse geographical areas, with various environmental, social, and economic condition; clustering with projects from HE Partnerships on “Driving urban transitions”; involvement of SSH experts, institutions

Type of action: Innovation Action

Specific conditions: The funding rate is up to 60% of the eligible costs, except for non-profit legal entities, where the funding rate is up to 100% of the total eligible costs.

Budget: 15 mln€: expected 2 projects, from 5 to 7.5 mln€

Technology Readiness Level: TRL 6-7 by the end of the project



Relevant projects



- ▮ **syn.ikia** aims at achieving sustainable plus energy neighbourhoods with more than 100% energy savings, 90% renewable energy generation triggered, 100% GHG emission reduction, and 10% life cycle costs reduction, compared to nZEB levels: <https://www.synikia.eu/>
- ▮ **T-Factor** is a Horizon 2020 project that seeks to unlock the transformative potential of temporary use in urban regeneration: <https://www.t-factor.eu/>



HORIZON-CL5-2022-D4-02-03: Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-emission cultural heritage: prevention, monitoring, management, maintenance, and renovation (Built4People)

Scope: Deliver technically and socially innovative, sustainable, energy and resource-efficient solutions for the cost-effective improvement and preservation of cultural heritage built environment along all relevant aspects: inclusiveness, accessibility, resilience, environmental and energy performance.

+ cultural heritage built environment; improvement and preservation; technically and socially innovative, sustainable, energy and resource efficient solutions; cost-effectiveness; whole life cycle; reduce maintenance and operational costs; digital technologies; renewable energy sources; involve relevant stakeholders; social innovation

Other elements: clustering with projects from HE Partnerships on “Driving urban transitions”; involvement of SSH experts, institutions

Type of action: Research and Innovation Action

Budget: 20 mln€: expected 4 projects, from 4 to 5 mln€

Technology Readiness Level: TRL 5 by the end of the project



Relevant project



- POCITYF is an EU-funded smart city project that will help historical cities to become greener, smarter and more livable while respecting their cultural heritage. By implementing and testing Positive Energy District in its cities, POCITYF will support Europe in the race to become the first Carbon Neutral Continent by 2050: <https://pocityf.eu/>



HORIZON-CL5-2022-D4-02-04: Smart-grid ready and smart-network ready buildings, acting as active utility nodes (Built4People)

Scope: Deliver building-to-grid integration solutions that are cost-effective, simple to use/install/maintain, and are applicable to both new and existing buildings.

+ electricity and other energy carriers; on-site energy storage/sources; big-data applications for real time management; predictive maintenance; smart readiness of buildings; digital models, BIM at building and district level; comfort and user satisfaction; viability of business models; large scale interoperable platforms with ESCOs, aggregators, DSOs, etc.

Other elements: clustering with projects from HE Partnerships on “Driving urban transitions”; projects expected to contribute to BRIDGE activities, w.r.t. data exchange and interoperability

Type of action: Innovation Action

Specific conditions: The funding rate is up to 60% of the eligible costs, except for non-profit legal entities, where the funding rate is up to 100% of the total eligible costs.

Budget: 18 mln€: expected 2 projects, from 6 to 9 mln€

Technology Readiness Level: TRL 7 by the end of the project

Relevant initiative: BRIDGE



HORIZON-CL5-2022-D4-02-05: More sustainable buildings with reduced embodied energy/ carbon, high life-cycle performance and reduced life-cycle costs (Built4People)

Scope: Demonstrate innovative design, construction and renovation methods, design and technology solutions that minimise the overall life-cycle environmental impact, reducing energy consumption and carbon footprint of the built environment across the life cycle, from construction to end of life thanks to, inter alia, applying circularity principles throughout the design and construction process, flexible use and lifecycle extension by design, design for deconstruction, disassembly and reassembly, integration of waste, reused, recycled, upcycled and bio-based materials and components, optimisation of design, construction and operation by means of digital tools.

+ minimise overall life-cycle environmental impact, energy consumption and carbon footprint; full building demonstrations; validated performance measurements; include local products and solutions; local reused or recycled construction products; secondary raw materials; advanced, market-ready prefabs; multifunctional materials and components; digital building logbook; digital tools, digital twins in the entire life cycle

Other elements: demonstrate solutions in diverse geographical areas, with various local environmental, social, and economic conditions; clustering with projects from HE Partnerships on “Driving urban transitions”

Type of action: Innovation Action

Specific conditions: The funding rate is up to 60% of the eligible costs, except for non-profit legal entities, where the funding rate is up to 100% of the total eligible costs.

Budget: 18 mln€: expected 2 projects, from 6 to 9 mln€

Technology Readiness Level: TRL 6-7 by the end of the project



Relevant initiative

<https://www.buildup.eu/en>



Home News & Events Practices Learn Explore Topics Skills Topic Of The Month

SEARCH

The Commission is in the process of updating some of the content on this website in light of the withdrawal of the United Kingdom from the European Union. If the site contains content that does not yet reflect the withdrawal of the United Kingdom, it is unintentional and will be addressed.

SPEAKER

LINK

SLAVICA ROBIĆ

Expert Talks - Slavica Robić & Louise Sunderland

Dr. sc. Slavica Robić, Assistant Director, REGEA



SPEAKER

LOUISE SUNDERLAND

Louise Sunderland, Senior Advisor, The Regulatory Assistance Project (RAP)



Expert Talks - Slavica Robić & Louise Sunderland

U-CERT & X-tendo final conference: enhanced and future-proof EPCs

Webinar - Towards Renewable Heating & Cooling: Replacement of Inefficient Systems in the Residential

Technical Article - Tool for Building Integrated Photovoltaics (BIPV) early design optimisation

Alleviating energy poverty in Europe's private-rented

Tweets by @EU_BUILDUP

- BU BUILD UP** @EU_BUILDUP
🏠 Large glass areas can significantly increase the #energydemands for cooling and #airconditioning in summer🔥
- 🏆 This competition invites to submit design concepts which include an optimum exploitation of the @Switch2Save_EU smart glass #technologies🤖
buildup.eu/en/news/how-ca...





Destination - 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**
- **5 topics in 2022** (88 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**
- **7 topics in 2022** (91 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
- **3 topics in 2022** (34 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



Open topics

| TOPIC CODE | TOPIC TITLE | OPENING DATE | DEADLINE | BUDGET PER GRANT Mil € | Number of projects expected to be funded |
|---------------------------|--|--------------|------------|---------------------------|--|
| HORIZON-CL5-2022-D6-02-06 | Smart and efficient ways to construct, maintain and decommission with zero emissions from transport infrastructure | 28/04/2022 | 06/09/2022 | Around 5 | 2 |



HORIZON-CL5-2022-D6-02-06: Smart and efficient ways to construct, maintain and decommission with zero emissions from transport infrastructure

Scope: Research should provide knowledge and technical solutions to limit transport emissions, both caused by transport infrastructure and to which transport infrastructure contributes, as the infrastructure related emissions are often unaccounted for. This is due to the long time between construction and decommissioning. Projects should cover the whole life cycle of transport infrastructure to which extent transport infrastructure design can influence and limit the overall emissions from construction, maintenance, operation and decommissioning of the infrastructure.

+ whole life cycle of transport infrastructures; modular, standard, prefab solutions; additive manufacturing techniques; smart and efficient energy management; energy harvesting; self-powered signalling; adaptive lighting systems; innovative tunnel ventilation;

Other elements: at least three demonstration pilots, considering different environments and phases of the infrastructure life cycle (design, construction, maintenance and decommissioning); proposal should build on previous results from projects on sensing, digitalisation, asset management, decision support and automation in the construction and maintenance of infrastructures

Type of action: Innovation Action

Budget: 10 mln€: expected 2 project, around 5 mln€ each

Technology Readiness Level: TRL 7 by the end of the project



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