Europe's hardest working innovation accelerator

General & Introductory Training
Cluster 5: Climate, Energy and Mobility
Horizon Europe Strategic Plan 2021-24 & Work Programme for ENERGY (Cluster 5+)

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07/04/2020

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1 Company Presentation

About us

- Strategic innovation partnering
- 10 years of EU Projects experience
- Multi-disciplinary staff
- We customize our offer and approach

R2M in Numbers

3.9M€ *Turnover 2020*	**70 employees** *45% Women* *- 25% PhDs*	**Top 3 SME in H202** *65 projects → 15.5M€*	**+278M€** *Funds raised*

Our Branches

Italy
R2M Solution S.r.l.
Via F.lli Cuzio 42
27100 Pavia, Italy
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France
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VAT: ES B87348470

United Kingdom
R2M Solution ltd.
Flat 4, 74 Holland Park
London, W11 3SL
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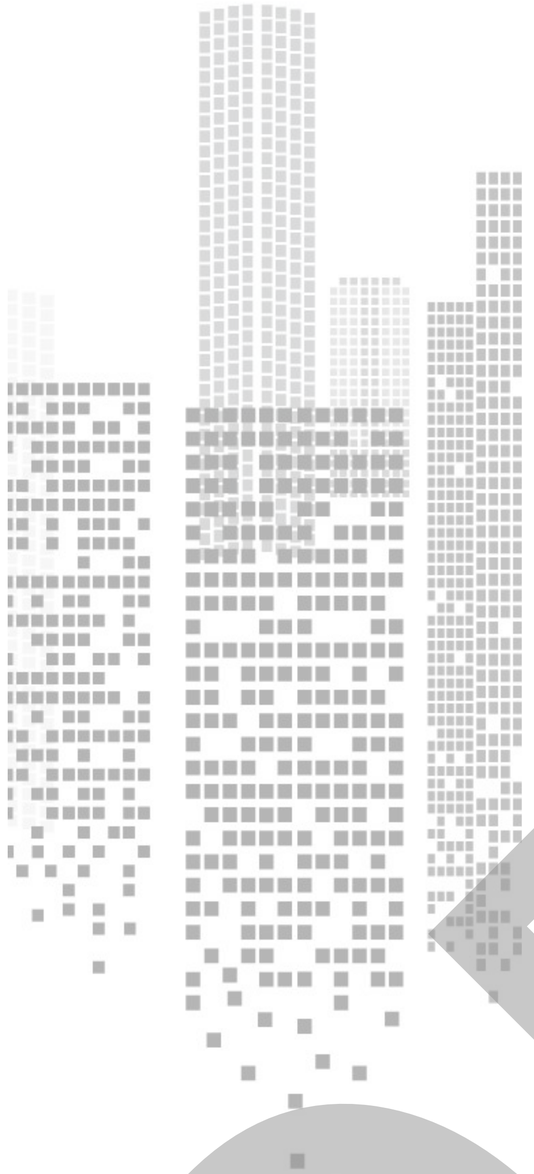
Ongoing projects

Completed projects



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Session #2: Horizon Europe Call & Proposal Documents

Work Programme and Call Documents

Horizon Europe supports research and innovation through Work Programmes, which set out funding opportunities for research and innovation activities.

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

Horizon Europe Admissibility

Same general admissibility conditions

- Applications must be submitted before the call deadline, electronically via the Funding & Tenders Portal
- Applications must be complete, readable, accessible and printable, and include a plan for the exploitation and dissemination of results, unless provided otherwise in the specific call conditions.

Proposal page limit

Substantial reduction in maximum length:

- RIAs and IAs type of actions: limit for a full application is 45 pages
- CSAs: limit is 30 pages
- First stage proposals: limit is 10 pages
- EIC Pathfinder: limit is 17 pages
- Exceptions, if any, would be specified in the call text.

Horizon Europe Eligibility

Consortium composition (collaborative projects)

- at least one independent legal entity established in a Member State, and
- at least two other independent legal entities each established either in a different Member State or an Associated Country.

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)

Who is 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*

Who is eligible for funding?

Associated Countries

For the purposes of the eligibility conditions, applicants established in Horizon 2020 Associated Countries or in other third countries negotiating association to Horizon Europe will be treated as entities established in an Associated Country, if the Horizon Europe association agreement with the third country concerned applies at the time of signature of the grant agreement.

Specific situation of UK

- The UK is expected to soon become an associated country to Horizon Europe. UK entities can take part in the first calls for proposals of Horizon Europe
- The UK is associating to the full Horizon Europe programme with the only exception of the EIC Fund (which is the loan/equity instrument of the EIC).

Activities eligible for funding

Eligible activities are the ones described in the call conditions

Activities must **focus exclusively on civil applications** and **must not**:

- aim at human cloning for reproductive purposes;
- intend to modify the genetic heritage of human beings which could make such changes heritable (except for research relating to cancer treatment of the gonads, which may be financed);
- intend to create human embryos solely for the purpose of research, or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer;
- lead to the destruction of human embryos.

Activities eligible for funding – Type of actions

Research and innovation action (RIA)

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

Innovation action (IA)

Activities to produce plans and arrangements or designs for new, altered or improved products, processes or services.

Coordination and support actions (CSA)

Activities that contribute to the objectives of Horizon Europe. This excludes R&I activities, except for 'Widening participation and spreading excellence'

Programme co-fund actions (CoFund)

A programme of activities established or implemented by legal entities managing or funding R&I programmes, other than EU funding bodies.

Innovation and market deployment actions (IMDA)

Activities that embed an innovation action and other activities necessary to deploy an innovation on the market. (EIC)

Training and mobility actions (TMA)

Activities that aim to improve the skills, knowledge and career prospects of researchers, based on mobility between countries and, if relevant, between sectors or disciplines. (MSCA)

Pre-commercial procurement actions/ (PCP)

Activities that aim to help a buyers' group to strengthen the public procurement of research, development, validation and, possibly, the first deployment of new solutions

Public procurement of innovative solutions actions (PPI)

Activities that aim to strengthen the ability of a buyers' group to deploy innovative solutions early

Maximum funding rates

Other funding rates may be set out in the specific call conditions

Type of Action	Funding rate
Research and innovation action	100%
Innovation action	70% (except for non-profit legal entities, where a rate of up to 100% applies)
Coordination and support action	100%
Programme co-fund action	Between 30% and 70%
Innovation and market deployment	70% (except for non-profit legal entities, where a rate of up to 100% applies)
Training and mobility action	100%
Pre-commercial procurement action	100%
Public procurement of innovative solutions action	50%

Evaluation (award) criteria

Same criteria as in H2020

Same three award criteria: **'Excellence'**, **'Impact'** and **'Quality and efficiency of the implementation'**. Excellence only for ERC.

Adapted following lessons learnt

- ➔ The number of **'aspects to be taken into account'** have been **reduced**, ensuring that the same aspect is not assessed twice
- ➔ **Open Science** practices assessed as part of the scientific methodology in the excellence criterion
- ➔ **New approach to impact**: Key Impacts Pathways (KIPs)
- ➔ The assessment of the **quality of applicants** is assessed under 'implementation', rather than as a separate binary assessment of operational capacity
- ➔ Assessment of **management structures** has been removed.

Evaluation criteria (RIAs and IAs)

EXCELLENCE

- Clarity and pertinence of the **project's objectives**, and the extent to which the proposed work is ambitious, and goes beyond the state-of-the-art.
- Soundness of the proposed **methodology**, including the underlying concepts, models, assumptions, inter-disciplinary approaches, appropriate consideration of the **gender dimension** in research and innovation content, and the quality of **open science practices** including sharing and management of research outputs and engagement of citizens, civil society and end users where appropriate.

IMPACT

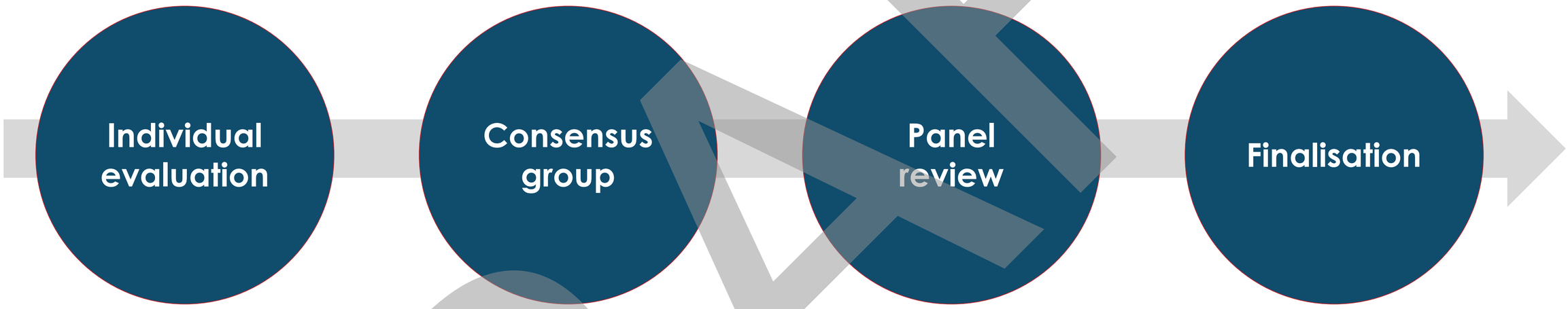
- Credibility of the **pathways** to achieve the expected **outcomes and impacts** specified in the work programme, and the likely scale and significance of the contributions due to the project.
- Suitability and quality of the **measures to maximize expected outcomes and impacts**, as set out in the dissemination and exploitation plan, including communication activities.

QUALITY AND EFFICIENCY OF THE IMPLEMENTATION

- Quality and effectiveness of the **work plan**, assessment of risks, and appropriateness of the effort assigned to work packages, and the resources overall.
- Capacity and role of each participant, and extent to which the **consortium** as a whole brings together the necessary expertise.

Proposals aspects are assessed to the extent that the proposed work is within the scope of the work programme topic

Standard evaluation process



Experts assess proposals **individually**. Minimum of three experts per proposal (but often more than three).

All individual experts discuss together to agree on a **common position**, including comments and scores for each proposal.

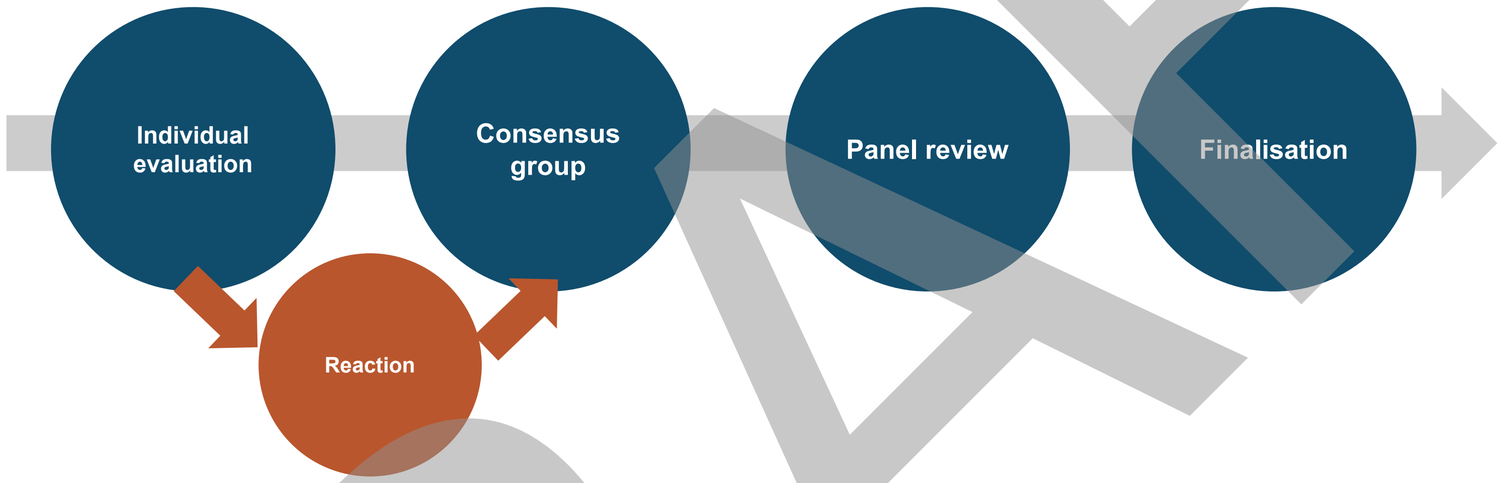
The panel of experts reach an **agreement** on the scores and comments for all proposals within a call, checking **consistency across the evaluations**.

if necessary, resolve cases where evaluators were unable to agree.

Rank the proposals with the same score

The Commission/Agency reviews the results of the experts' evaluation and puts together the **final ranking list**.

Piloting new processes based on lessons learnt



Right-to-react (Rebuttal)

- ➔ Objective is to increase transparency, to correct any factual or major misunderstandings by experts at an early stage, and provide more detailed feedback to applicants.
- ➔ Applicants will send their reactions to draft experts comments
- ➔ Experts will take applicants' reaction into account before finalising their final assessment.

Piloting new processes based on lessons learnt

Blind evaluation (in 1st stage)

- There is no evidence that the current proposal evaluation system is systematically biased.
- There are understandable concerns that evaluation experts may be swayed – perhaps unconsciously – in favour of proposals from well-known organisations in countries with better performing R&I systems.
- 'Blind' evaluation is a way to remove any real or perceived effect of such reputational bias.
- Experts evaluate without knowing the identity of participants.
- The work programme will include an additional admissibility criterion: applicants can not be disclosed in the narrative part of the proposal.

Ethics review

Same criteria as in H2020

For all activities funded, ethics is an **integral part** of research from beginning to end, and **ethical compliance** is essential to achieve real research excellence. An ethics review process is carried out systematically in all Horizon Europe proposals, based on a **self-assessment** included in the proposal.

Ethical research conduct implies the application of fundamental ethical principles and legislation in all possible domains of research. This includes the adherence to the highest standards of **research integrity** as described in the **European Code of Conduct for Research Integrity**.

Adapted following lessons learnt

- ➔ Focus mainly on complex/serious cases
- ➔ Reduce number of ethics requirements in funded projects.

Security scrutiny

New in Horizon Europe

Security issues will be checked **systematically** in all Horizon Europe proposals (in H2020 only proposals submitted to topics flagged as 'security-sensitive' were checked). The checks are based on a **self-assessment** included in the proposal. The focus is on:

- Whether the proposal uses or generates **EU classified information**
- Potential of **misuse** of results (that could be channeled into crime or terrorism)
- Whether activities involve information or materials subject to **national security restrictions**

The checks based on the self-assessment may trigger an in-depth security scrutiny.

Application form (proposal template -> Link)


Horizon Europe Programme

Standard Proposal Template (RIA, IA)

Application forms (Part A)
Project proposal – Technical description (Part B)

Version 1.0
10 March 2021

Disclaimer
This document is aimed at informing potential applicants for Horizon Europe funding. It serves only as an example. The actual Web forms and templates, provided in the online submission system under the Funding and Tenders Portal, might differ from this example.

Same structure

The proposal contains two parts:

- **Part A** (web-based forms) is generated by the IT system. It is based on the information entered by the participants through the submission system in the Funding & Tenders Portal.
- **Part B** is the narrative part that includes three sections that each correspond to an evaluation criterion. Part B needs to be uploaded as a PDF document following the templates downloaded by the applicants in the submission system for the specific call or topic.

New features in the Horizon Europe proposal

NEW FIELDS IN PART A

- Researchers table – needed to follow up researchers careers (HE indicator)
- Role of participating organisation
- Self-declaration on gender equality plan

FIELDS MOVED FROM PART B TO PART A

- Ethics self-assessment
- Security questionnaire (**NEW! in all HE proposals**)
- Information on participants' previous activities related to the call

NEW IN PART B

- Glossary of terms.
- Consistency on the use of terminology is ensured in all project phases (from WP to proposal and reporting)
- Extensive explanations on what exactly should be included in each section.

Key principles

- Your proposed work must be within the scope of a work programme topic
- You need to demonstrate that your idea is ambitious and goes beyond the state of the art
- Your scientific methodology must take into account interdisciplinary, gender dimension and open science practices. It must not significantly harm the environment
- You should show how your project could contribute to the outcomes and impacts described in the work programme (the pathway to impact)
- You should describe the planned measures to maximise the impact of your project ('plan for the dissemination and exploitation including communication activities')
- You should demonstrate the quality of your work plan, resources and participants

Policy and horizontal considerations

- ➔ Open Science across the programme
- ➔ Gender dimension in R&I content
- ➔ Pathway to impact
- ➔ Measures to maximise impact
- ➔ Do no significant harm principle (DNSH)

These aspects must normally be considered in all Horizon Europe calls (unless explicitly mentioned in the topic description).

Specific calls may include other aspects to take into account.

Open Science across the programme

Open Science

Open science is an approach based on open cooperative work and systematic sharing of knowledge and tools as early and widely as possible in the process. Including active engagement of society

Mandatory immediate Open Access to publications: beneficiaries must retain sufficient IPRs to comply with open access requirements;

Data sharing as 'open as possible, as closed as necessary': mandatory Data Management Plan for FAIR (Findable, Accessible, Interoperable, Reusable) research data

- ➔ Work Programmes may incentivize or oblige to adhere to **open science practices** such as involvement of citizens, or to use the **European Open Science Cloud**
- ➔ Assessment of open science practices through the **excellence award criteria** for proposal evaluation. Under **quality of participants** previous experience on open sciences practices will be evaluated positively.
- ➔ Dedicated support to **open science policy actions**
- ➔ **Open Research Europe** publishing platform

Gender dimension in R&I content

Gender Dimension

Addressing the gender dimension in research and innovation entails taking into account sex and gender in the whole research & innovation process.

The integration of the gender dimension into R&I content is mandatory, unless it is explicitly mentioned in the topic description

Why is gender dimension important?

- Why do we observe differences between women and men in infection levels and mortality rates in the COVID-19 pandemic?
- Does it make sense to study cardiovascular diseases only on male animals and on men, or osteoporosis only on women?
- Does it make sense to design car safety equipment only on the basis of male body standards?
- Is it responsible to develop AI products that spread gender and racial biases due to a lack of diversity in the data used in training AI applications?
- Is it normal that household travel surveys, and thus mobility analysis and transport planning, underrate trips performed as part of caring work?
- Did you know that pheromones given off by men experimenters, but not women, induce a stress response in laboratory mice sufficient to trigger pain relief?
- And did you know that climate change is affecting sex determination in a number of marine species and that certain populations are now at risk of extinction?

Describing the impact of your proposal

Project's pathway towards impact

…by thinking about the specific contribution the project can make to the expected outcomes and impacts set out in the Work Programme.

SPECIFIC NEEDS

What are the specific needs that triggered this project?

➔ **Example 1**

Most airports use process flow-oriented models based on static mathematical values limiting the optimal management of passenger flow and hampering the accurate use of the available resources to the actual demand of passengers.

➔ **Example 2**

Electronic components need to get smaller and lighter to match the expectations of the end-users. At the same time there is a problem of sourcing of raw materials that has an environmental impact.

EXPECTED RESULTS

What do you expect to generate by the end of the project?

➔ **Example 1**

Successful large-scale demonstrator: Trial with 3 airports of an advanced forecasting system for proactive airport passenger flow management.

Algorithmic model:
Novel algorithmic model for proactive airport passenger flow management.

➔ **Example 2**

Publication of a **scientific discovery on transparent electronics.**

New product: More sustainable electronic circuits.

Three PhD students trained.

D & E & C MEASURES

What dissemination, exploitation and communication measures will you apply to the results?

➔ **Example 1**

Exploitation: Patenting the algorithmic model.

Dissemination towards the scientific community and airports: Scientific publication with the results of the large-scale demonstration.

Communication towards citizens: An event in a shopping mall to show how the outcomes of the action are relevant to our everyday lives.

➔ **Example 2**

Exploitation of the new product: Patenting the new product; Licencing to major electronic companies.

Dissemination towards the scientific community and industry: Participating at conferences; Developing a platform of material compositions for industry; Participation at EC project portfolios to disseminate the results as part of a group and maximise the visibility vis-à- vis companies.

Describing the impact of your proposal

TARGET GROUPS

Who will use or further up-take the results of the project? Who will benefit from the results of the project?

➔ **Example 1**

9 European airports:
Schiphol, Brussels airport, etc.

The European Union aviation safety agency.

Air passengers (indirect).

➔ **Example 2**

End-users: consumers of electronic devices.

Major electronic companies: Samsung, Apple, etc.

Scientific community (field of transparent electronics).

OUTCOMES

What change do you expect to see after successful dissemination and exploitation of project results to the target group(s)?

➔ **Example 1**

Uptake by airports: 9 European airports adopt the advanced forecasting system demonstrated during the project.

➔ **Example 2**

High use of the scientific discovery published (measured with the relative rate of citation index of project publications).

A major electronic company (Samsung or Apple) exploits/uses the new product in their manufacturing.

D & E & C MEASURES

What are the expected wider scientific, economic and societal effects of the project contributing to the expected impacts outlined in the respective destination in the work programme?

➔ **Example 1**

Scientific: New breakthrough scientific discovery on passenger forecast modelling.

Economic: Increased airport efficiency Size: 15% increase of maximum passenger capacity in European airports, leading to a 28% reduction in infrastructure expansion costs.

➔ **Example 2**

Scientific: New breakthrough scientific discovery on transparent electronics.

Economic/Technological: A new market for touch enabled electronic devices.

Societal: Lower climate impact of electronics manufacturing (including through material sourcing and waste management).

Describing the impact of your proposal

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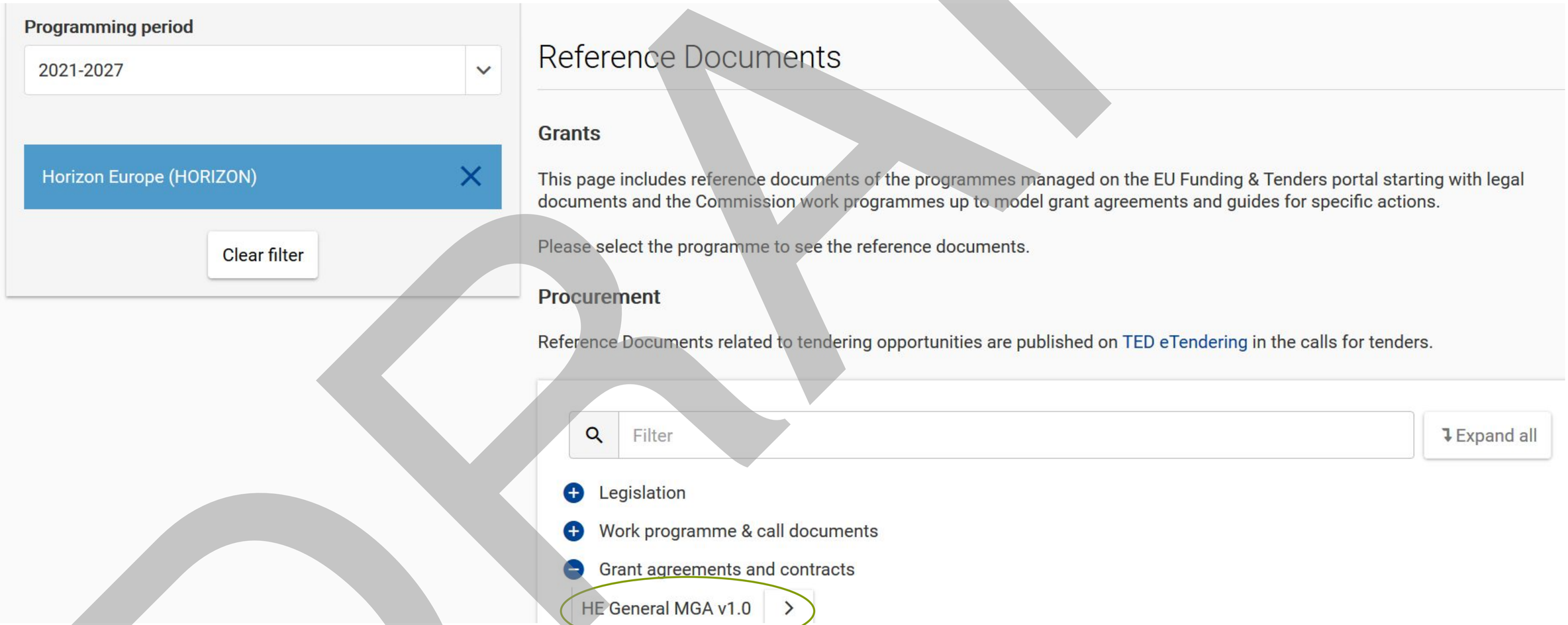
Horizon Europe General MGA

Version 1 published on 25 February 2021 on the Funding and Tenders Portal



Main changes at a glance (Details in this link)

Certificate

Systems and Process Audit (NEW)

Affiliated Entity

Change of terminology

Associated Partner

Third party specific status

Open Science

Enhanced practices

IPR & Exploitation

Horizon Results Platform

Personnel costs

Corporate daily rate

Internal Invoicing

Actual indirect costs

In-kind contributions against payment

No more specific Article

Indirect costs

Overall continuity with 25% flat-rate (with exceptions)

CFS Thresholds

Higher thresholds

Corporate MGA

Terminology, Data Sheet & Annex 5

2

Session 3: Focus on Pillar II: Energy in Horizon Europe (Cluster 5+)

Horizon Europe: Pillar 2 – Global Challenges and Industrial Competitiveness (€52.7 billion)

This pillar will strengthen the impact of research and innovation in **developing, supporting and implementing Union policies**, and support the **uptake of innovative solutions in industry and society to address global challenges.**

To maximise impact flexibility and synergies, research and innovation activities will be organised in five clusters, which individually and together will **incentivise interdisciplinary, cross-sectoral, cross-policy, cross-border and international cooperation**. Each cluster contributes towards several SDGs; and many SDGs are supported by more than one cluster.

The R&I activities will be implemented in and across the following Pillar 2 clusters:

- **Health (€7.7 billion)**
- **Inclusive and Secure Society (€2.8 billion)**
- **Digital and Industry (€15 billion)**
- **Climate, Energy and Mobility (€15 billion)**
- **Food and Natural Resources (€10 billion)**

Horizon Europe: Pillar 2 – Cluster 5 'Climate, Energy and Mobility' (Final Draft -> Link)

Fighting climate change by better understanding its causes, evolution, risks, impacts and opportunities, and by making the energy and transport sectors more climate and environment-friendly, more efficient and competitive, smarter, safer and more resilient.

Areas of intervention

- 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 transport and mobility
- Smart mobility
- Energy storage

Horizon Europe: Pillar 2 – Cluster 5 'Climate, Energy and Mobility'

Destination (Cluster 5 work programme)	Expected Impact (Strategic Plan)
1. Climate sciences and responses for the transformation towards climate neutrality	Transition to a climate-neutral and resilient society and economy enabled through advanced climate science, pathways and responses to climate change (mitigation and adaptation) and behavioural transformations.
2. Cross-sectoral solutions for the climate transition	Clean and sustainable transition of the energy and transport sectors towards climate neutrality facilitated by innovative cross cutting solutions.
3. Sustainable, secure and competitive energy supply	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.
4. Efficient, sustainable and inclusive energy use	Efficient and sustainable use of energy, accessible for all is ensured through a clean energy system and a just transition.
5. Clean and competitive solutions for all transport modes	Towards climate-neutral and environmental friendly mobility through clean solutions across all transport modes while increasing global competitiveness of the EU transport sector.
6. Safe Resilient Transport and Smart Mobility services for passengers and goods	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.

Horizon Europe: Pillar 2 – Cluster 5 Partnerships

Institutional Partnerships

- Transforming Europe's rail system
- Integrated Air Traffic Management
- Clean Aviation
- Clean Hydrogen

Co-funded Partnerships

- Driving urban transitions to a sustainable future (DUT)
- Clean Energy Transition

Co-programmed Partnerships

- Built4People | People-centric sustainable built environment
- Towards zero-emission road transport (2ZERO)
- Batteries: Towards a competitive European industrial battery value chain for stationary applications and e-mobility
- Zero-emission waterborne transport
- Connected, Cooperative and Automated Mobility (CCAM)

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

Earth system science

➔ CSR 1 – CSR 3

Analysis of pathways leading to climate neutrality

➔ CSR 4 – CSR 9

Adaptation and climate services

➔ CSR 10 – CSR 12

Social science to tackle climate change

➔ CSR 13 – CSR 14

Climate-ecosystem interactions

➔ CSR 15 – CSR 17

Destination 2: Cross-sectoral solutions for the climate transition

Batteries

- Raw materials processing technologies
- Advanced materials
- Manufacturing processes
- Battery Systems
- Recycling technologies
- Cross-cutting

Cities and Communities

- Mobility services, urban mobility
- Positive Energy Districts
- Zero-pollution, nature-based solutions
- Digitalisation, urban platforms
- Social innovation, lifestyle changes

Destination 2: Cross-sectoral solutions for the climate transition

Emerging breakthrough technologies and climate solutions

- Emerging technologies for a climate neutral Europe
- Methane cracking to usable hydrogen and carbon
- Technologies for non-CO2 greenhouse gases removal
- Direct atmospheric carbon capture and conversion

Citizens and stakeholder engagement

- Fostering a just transition in Europe
- Strengthening Social Sciences and Humanities research communities in climate, energy and mobility disciplines
- Accelerating the climate transition in difficult contexts: transition super-labs (pilot)

Destination 2 in 2021- *Deadline 19-Oct-2021*

Section	Topic	Type of Action	Budget 2021	Deadline	Contribution per project
Batteries	CL5-2021-D2-01-01: Sustainable processing, refining and recycling of raw materials (battery partnership)	RIA	21	19-Oct-21	
"	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)	RIA	24	19-Oct-21	7
"	CL5-2021-D2-01-03: Advanced high-performance Generation 4a, 4b (solid-state) Li-ion batteries supporting electro mobility and other applications ((Batteries Partnership))	RIA	36	19-Oct-21	8
"	CL5-2021-D2-01-04: Emerging technologies for a climate neutral Europe	RIA	20	19-Oct-21	5
"	CL5-2021-D2-01-05: Manufacturing technology development for solid-state batteries (Generations 4a - 4b batteries)	RIA	24	19-Oct-21	5
"	CL5-2021-D2-01-06: Sustainable, safe and efficient recycling processes	RIA	30	19-Oct-21	9
"	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.	CSA	3	19-Oct-21	3
Breakthroug	CL5-2021-D2-01-08: Emerging technologies Technology for a climate neutral Europe cleaner transport and energy system	RIA	20	19-Oct-21	2,5
"	CL5-2021-D2-01-09: Methane cracking to usable hydrogen and carbon	RIA	15	19-Oct-21	2
"	CL5-2021-D2-01-10: Technologies for non-CO2 greenhouse gases removal	RIA		19-Oct-21	3
"	CL5-2021-D2-01-11: Direct atmospheric carbon capture and conversion	RIA		19-Oct-21	3
Citizen and stakeholder engagemen	CL5-2021-D2-01-12: Fostering a just transition in Europe	RIA	10	19-Oct-21	4
"	CL5-2021-D2-01-13: Strengthening Social Sciences and Humanities (SSH) research communities in climate, energy and mobility disciplines	CSA	3	19-Oct-21	3
"	CL5-2021-D2-01-14: Accelerating the climate transition in difficult contexts: transition super-labs (pilot)	CSA	2	19-Oct-21	3
"	CL5-2021-D2-01-15: Fostering cooperation between Horizon Europe cluster 5 National Contact Points (NCPs)	CSA	2	19-oct-21	2,5
"	CL5-2021-D2-01-16: Co-Funded Partnership: Driving Urban Transitions to a sustainable future (DUT)	co-funds	37	19-oct-21	

Destination 3: Sustainable, secure and competitive energy supply

Global Leadership in Renewable Energy

- Concentrated Solar Power, Photovoltaics
- Wind, Ocean, Hydropower, Geotermal
- Renewable fuels, bioenergy, synthetic fuels, solar fuels
- Combined heat and power, renewable heating and cooling

Energy systems, grids and storage

- Energy sector integration
- Electricity system reliability and resilience
- Transmission of energy
- Green digitalisation of the energy system – interoperability and data
- Storage development and integration

Destination 3: Sustainable, secure and competitive energy supply

Carbon capture, utilization and storage (CCUS)

- Integration of CCUS in hubs and clusters
- Decarbonising industry with CCUS
- Cost reduction of CO2 capture

Cross-cutting issues

- Support to the activities of the European Geological Services
- Support to the activities of the European Technology Platforms and technology areas of the SET-Plan

Destination 3 in 2021- *Deadline 26-Ago-2021*

Section	Topic	Type of Action	Budget 2021	Deadline	Contribution per project
RES	CL5-2021-D3-01-01: Demonstration of wave energy devices to increase experience in real sea condition	IA	15	26-ago-21	15
RES	CL5-2021-D3-01-02: Sustainability and educational aspects for renewable energy and fuel technologies	CSA	10	26-ago-21	2,5
RES	CL5-2021-D3-01-03: Market Uptake Measures of renewable energy systems	CSA	10	26-ago-21	2
Energy system and storage	CL5-2021-D3-01-04: Energy Sector Integration: Integrating and combining energy systems to a cost-optimised and flexible energy system of systems. IREC is considering to lead with IEA. f leading	IA	30	26-ago-21	10
Energy system and storage	CL5-2021-D3-01-05: Increasing energy system flexibility based on sector-integration services to consumers (that benefits system management by DSOs and TSOs)	IA	20	26-ago-21	10
Energy system and storage	CL5-2021-D3-01-06: Reliability and resilience of the grid: Measures for cybersecurity, vulnerabilities, failures, risks and privacy	IA	15	26-ago-21	8
Energy system and storage	CL5-2021-D3-01-07: Electricity system reliability and resilience by design: HVDC-based systems and solutions	RIA	15	26-ago-21	8
Energy system and storage	CL5-2021-D3-01-08: Demonstration of superconducting systems	IA	15	26-ago-21	15
Energy system and storage	CL5-2021-D3-01-09: Demonstration of advanced Power Electronics for application in the energy sector	IA	10	26-ago-21	5
Energy system and storage	CL5-2021-D3-01-10: Laying down the basis for the demonstration of a prototype Real Time Demonstrator of Multi-Vendor Multi-Terminal HVDC with Grid Forming Capability: Coordinated action	CSA	1	26-ago-21	1
Energy system and storage	CL5-2021-D3-01-11: Establish the grounds for a common European energy data space	IA	32	26-ago-21	8
Energy system and storage	CL5-2021-D3-01-12: Reinforcing digitalisation related know how of local energy ecosystems	CSA	4	26-ago-21	4
Energy system and storage	CL5-2021-D3-01-13: Interoperability community	CSA	5	26-ago-21	5
CCUS	CL5-2021-D3-01-14: Integration of CCUS in hubs and clusters, including knowledge sharing activities	CSA	2	26-ago-21	2
CCUS	CL5-2021-D3-01-15: Cost reduction of CO2 capture (new or improved technologies)	RIA	30	26-Aug-21	15
Cross-cutting	CL5-2021-D3-01-16: Support to the activities of the European Geological Services	CSA	20	26-Aug-21	20

Destination 4: Efficient, sustainable and inclusive energy use

Highly energy-efficient and climate neutral EU building stock

- Building Energy Efficiency: energy performance, smartness
- People-centric, cost-effective and sustainable renovation
- Solutions for an inclusive, resilient, sustainable and modern built environment

Industrial facilities in the energy transition

- Full-scale demonstration of heat upgrade technologies with supply temperature in the range 90-160°C
- Development and pilot demonstration of heat upgrade technologies with supply temperature in the range 150-250°C
- Development of high temperature thermal storage for industrial applications
- Industrial excess (waste) Heat-to-Power conversion based on organic Rankine cycles

Destination 4 in 2021- *Deadline 19-Oct-2021*

Section	Topic	Type of Action	Budget 2021	Deadline	Contribution per project
Buildings	CL5-2021-D4-01-01: Advanced energy performance assessment and certification	IA	10	19-Oct-21	3
Buildings	CL5-2021-D4-01-02: Industrialisation of deep renovation workflows for energy-efficient buildings	IA	16	19-Oct-21	8
Buildings	CL5-2021-D4-01-03: Advanced data-driven monitoring of building stock energy performance	IA	10	19-Oct-21	5
Industry	CL5-2021-D4-01-04: Full-scale demonstration of heat upgrade technologies with supply temperature in the range 90 - 160°C	IA	16	19-Oct-21	8
Industry	CL5-2021-D4-01-05: Industrial (Waste) Heat-to-Power conversion based on Organic Rankine Cycles	IA	14	19-Oct-21	14

Destination 5: Clean and competitive solutions for all transport modes

Zero-emission road transport

- Next-Gen vehicles and components
- Optimize EV charging
- LCA and design for sustainable circularity
- Road Transport R&I dissemination and implementation in Europe and around the World

Aviation

- Greenhouse gas aviation emissions reduction technologies towards climate neutrality by 2050
- Aviation Research Policy in support to EU policies
- Digital aviation technologies for new aviation business models

Destination 2: Cross-sectoral solutions for the climate transition

Waterborne Transport

- Digital Twin models to enable green ship operations
- Integration of new fuels
- Safe and efficient on-board storage and integration
- On-board energy saving solutions

Transport-related health and environmental issues

- Support for dissemination events in the field of Transport Research
- Strengthening health and environmental research in mobility disciplines

Destination 5 in 2021- *Deadline 7-Sep-2021*

Section	Topic	Type of Action	Budget 2021	Deadline	Contribution per project
Zero emission road transport	CL5-2021-D5-01-01: Nextgen vehicles: Innovative zero emission BEV architectures for regional freight haulage	IA	45	7-sept-21	15
Zero emission road transport	CL5-2021-D5-01-02: Nextgen EV components: Integration of advanced power electronics and associated controls	RIA	20	7-sept-21	4
0	CL5-2021-D5-01-03: System approach to achieve optimised Smart EV Charging and V2X flexibility in mass-deployment conditions	RIA	25	7-sept-21	7
Zero emission road transport	CL5-2021-D5-01-04: LCA and design for sustainable circularity - holistic approach to the battery value chain and for zero-emission mobility solutions	CSA	4	7-sept-21	4
Aviation	CL5-2021-D5-01-05: Greenhouse gas aviation emissions reduction technologies towards climate neutrality by 2050	RIA	20	7-sept-21	2
Waterborne transport	CL5-2021-D5-01-06: Next generation digital aircraft transformation in design, manufacturing, integration and maintenance	RIA	25	7-sept-21	6
Waterborne transport	CL5-2021-D5-01-07: Enabling the safe and efficient on-board storage and integration within ships of large quantities of ammonia and hydrogen fuels (ZEWT Partnership)	IA	20	7-sept-21	10
Waterborne transport	CL5-2021-D5-01-08: Enabling the full integration of very high power fuel cells in ship design using co-generation and combined cycle solutions for increased efficiency with multiple fuels	RIA	15	7-sept-21	15
Waterborne transport	CL5-2021-D5-01-09: CSA identifying waterborne sustainable fuel deployment scenarios (ZEWT Partnership)	CSA	0,5	7-sept-21	0,5
Waterborne transport	CL5-2021-D5-01-10: Innovative on-board energy saving solutions (ZEWT Partnership)	RIA	20	7-sept-21	5
Waterborne transport	CL5-2021-D5-01-11: Hyper powered vessel battery charging system	IA	14	7-sept-21	7
Waterborne transport	CL5-2021-D5-01-12: Assessing and preventing methane slip from LNG engines in all conditions within both existing and new vessels	IA	7	7-sept-21	7
Waterborne transport	CL5-2021-D5-01-13: Digital Twin models to enable green ship operations	RIA	7	7-sept-21	7
Waterborne transport	CL5-2021-D5-01-14: Proving feasibility of large clean ammonia marine engine	IA	10	7-sept-21	10
Waterborne transport	CL5-2021-D5-01-15: Development and demonstration of cost affordable and adaptable retrofit solutions for tailpipe and brake polluting emissions	IA	10	7-sept-21	5
Waterborne transport	CL5-2021-D5-01-16: Assessment of noise and particle emissions of L category vehicles from real driving conditions	RIA	5	7-sept-21	5

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

Connected, Cooperative and Automated Mobility (CCAM)

- ➔ More powerful and reliable on-board perception and decision-making technologies

Multimodal and sustainable transport systems for passengers and goods

- ➔ More efficient multimodal freight transport nodes to increase flexibility, service visibility and reduce the average cost of freight transport

Safety and resilience - per mode and across all transport modes

- ➔ Safety in Urban Areas/ Road Transport Safety
- ➔ Waterborne Safety and Resilience
- ➔ Aviation Safety and Resilience

Destination 6 in 2021- *Deadline 19-Oct-2021*

Section	Topic	Type of Action	Budget 2021	Deadline
CCAM	CL5-2021-D6-01-01: More powerful and reliable on-board perception and decision-making technologies addressing complex environmental conditions	IA	15	19-oct-21
CCAM	CL5-2021-D6-01-02: Common approaches for the safety validation of CCAM systems	RIA	15	19-oct-21
CCAM	CL5-2021-D6-01-03: Physical and Digital Infrastructure (PDI), connectivity and cooperation enabling and supporting CCAM	IA	18	19-oct-21
CCAM	CL5-2021-D6-01-04: Cyber secure and resilient CCAM	RIA	12	19-oct-21
CCAM	CL5-2021-D6-01-05: Analysis of socio-economic and environmental impacts and assessment of societal, citizen and user aspects for needs based CCAM solutions	RIA	8	19-oct-21
Multimodal, Infrastructure, logistics	CL5-2021-D6-01-07: More efficient multimodal freight transport nodes to increase flexibility, service visibility and reduce the average cost of freight transport	IA	15	19-oct-21
Multimodal, Infrastructure, logistics	CL5-2021-D6-01-08: New delivery methods to green the last mile and optimise road transport	IA	15	19-oct-21
Multimodal, Infrastructure, logistics	CL5-2021-D6-01-09 Climate resilient and environmentally sustainable transport infrastructure	IA	18	19-oct-21
Safety	CL5-2021-D6-01-10: Testing Safe lightweight vehicles and improved safe human-technology interaction in the future traffic system	RIA	12	19-oct-21
Safety	CL5-2021-D6-01-11: Radical improvement of road safety in low and medium income countries in Africa	RIA	8	19-oct-21
Safety	CL5-2021-D6-01-12: Controlling infection on large passenger ships	RIA	8	19-oct-21
Safety	CL5-2021-D6-01-13: Safe automation and human factors in aviation – intelligent integration and assistance	IA	12	19-oct-21

Energy in the other Clusters

Cluster 4: Digital, Industry and Space

- TWIN-TRANSITION-01-14: Deploying industrial-urban symbiosis demonstrators for the utilisation of energy, water, industrial waste and by-products at regional scale (RIA)
- TWIN-TRANSITION-01-21: Design and optimisation of energy flexible industrial processes (IA)
- HUMAN-01-19: Testing innovative solutions on local communities'-demand (IA)
- RESILIENCE-01-16: Building and renovating by exploiting advanced materials for energy and resources efficient management (IA)
- RESILIENCE-01-32: Social and affordable housing district demonstrator (IA)

Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

- CircBio-01-01 Circular Cities and Regions initiative (CCRI)'s circular systemic solutions
- CL6-2021-BIODIV-01-17 Biodiversity, water, food, energy, transport, climate and health nexus in the context of transformative change
- COMMUNITIES-02-01-two-stage Smart solutions for smart rural communities: empowering rural communities and smart villages to innovate for societal change

Thank you

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