Selected calls, Cluster 5

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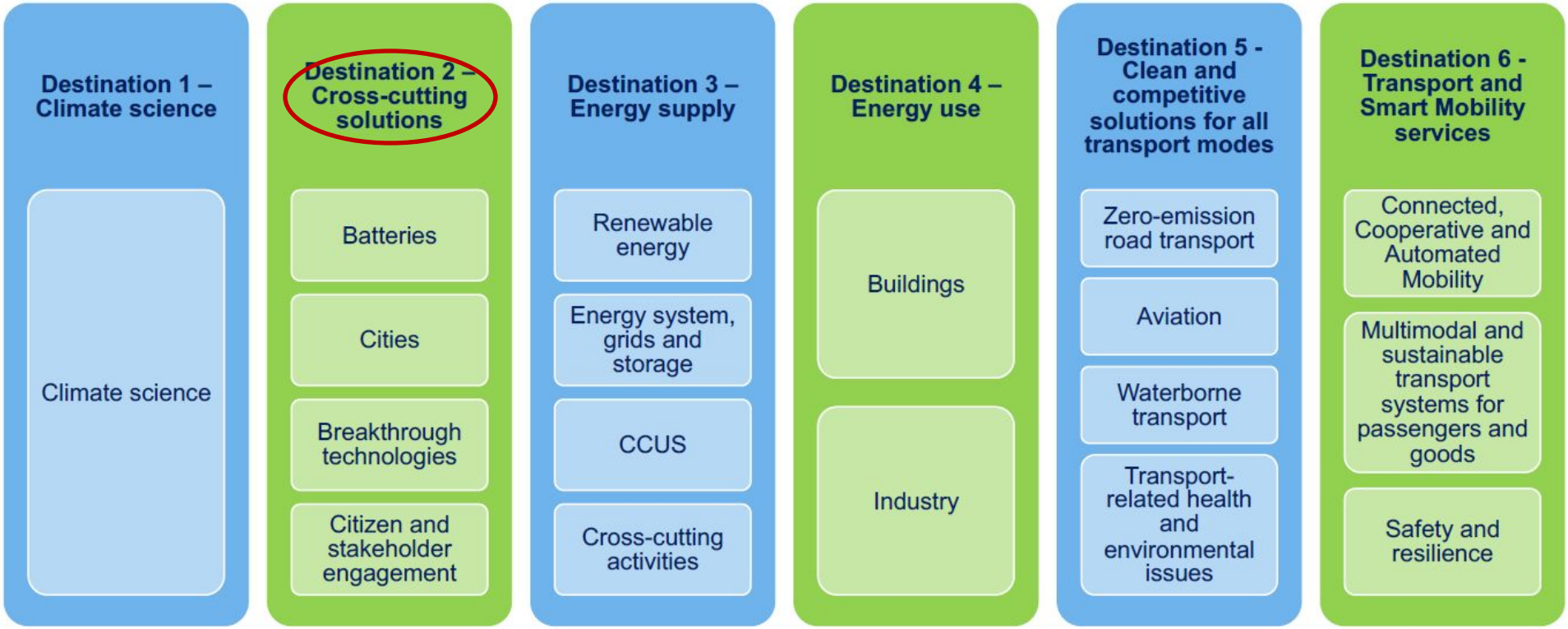
20th/22th july

Cluster 5 – WorkProgramme overview



D2-01-08 D3-03-02 D6-01-10

Selected Calls

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million)[1]	Number of projects expected to be funded
		2021	2022		
Deadline(s): 19 Oct 2021					
HORIZON-CL5-2021-D2-01-08	RIA	20.00		Around 2.50	8
HORIZON-CL5-2021-D6-01-10	RIA	12.00		3.50 to 4.00	3
Deadline(s): 23 Feb 2022					
HORIZON-CL5-2021-D3-03-02	RIA		33.00	Around 3.00	11

HORIZON-CL5-2021-D2-01-08:

Emerging technologies for a climate neutral Europe

Scope: The proposal is expected to **address one** of the following areas:

- Decarbonised, efficient, effective, and safe Transport;
- Fuel cells;
- Efficient energy generators;
- Energy distribution;
- Energy storage;
- Negative GHG emissions.

Cross-cutting solutions

The following areas **should not** be covered as they fall within either partnerships or other calls:

- ~~Material research;~~
- ~~Renewable energy technologies and renewable hydrogen production are addressed under HORIZON-CL5-2021-D3-03-02;~~
- ~~Batteries.~~

HORIZON-CL5-2021-D2-01-08:

Emerging technologies for a climate neutral Europe

Proposals may consider the following areas:

- Technologies providing the possibility of multi-fuel integration and/or the potential for the transversal;
- Intersectorial decarbonization;
- Concepts targeting hard-to-decarbonize sectors and energy-intensive applications, such as road/rail/maritime transport or energy generation though thermal power generators;
- Flexibility in terms of its scalability to different power/energy demands;
- Compatibility with local or distributed energy production layouts;
- Use of already available industrial processes and raw materials for easy TRL upgrading and final transfer to mass production.

HORIZON-CL5-2021-D2-01-08:

Emerging technologies for a climate neutral Europe

In developing its concept the proposal is expected to address the following related aspects:

- Lower environmental impact (e.g. on climate change, pollution and biodiversity) quantified based on Life Cycle Assessment (LCA) framework;
- Better resource efficiency (materials, geographical footprints, water, etc…) than current commercial technologies;
- Barriers to the deployment of such technologies, including issues related to social acceptance or resistance to new energy technologies, related socioeconomic and livelihood issues globally;
- Prospective life cycle approach to be done with the relevant information that can be gathered at such TRL level.

SSH – Social Sciences & Humanities

HORIZON-CL5-2021-D2-01-08:

Emerging technologies for a climate neutral Europe

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

- Available **high-risk/high return** technologies for a transition to a net greenhouse gas neutral EU economy by 2050.
- Knowledge and scientific proofs of the **technological feasibility** of the concept.
- Environmental, social and economic benefits to contribute to R&I strategy and policy forecast.
- Establishing a solid long term dependable European innovation base.

HORIZON-CL5-2021-D2-01-08:

Emerging technologies for a climate neutral Europe

- Type of action: Research & Innovation Action (RIA)
- EU indicative budget: 20 M€
- EU contribution per project: estimated ~2.5 M€
- Deadline: 19 October 2021
- Special topic conditions: To achieve TRL 4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HORIZON-CL5-2021-D3-03-02:

Next generation of renewable energy technologies

Scope: The proposal is expected to address **high-risk/high return** technology developments for **game changing renewable energy technologies** including catalyst development, dedicated storage systems and integration of renewable energy technologies into a single energy generation system, heating & cooling systems, fuels production systems, hybrid electricity generation solutions between different renewable energy sources, direct utilization of renewable energy sources. … production of renewable hydrogen *directly* from renewable energy sources.

The following areas should **not be covered :** ~~Pure material research, *Conventional* hydrogen production and fuel cells, Batteries.~~

Address: lower environmental impact, better resource efficiency … than current commercial renewable technologies, … social acceptance … related socioeconomic and livelihood issues … regulatory frameworks.

HORIZON-CL5-2021-D3-03-02:

Next generation of renewable energy technologies

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

- Available **breakthrough** and **game changing** renewable energy technologies enabling a faster transition to a net-zero greenhouse gas emissions EU economy by 2050.
- Knowledge and scientific proofs of the **technological feasibility** of the concept including the environmental, social and economic benefits to contribute to R&I strategy and policy forecast.
- Establishing a solid long term dependable European innovation base.

HORIZON-CL5-2021-D3-03-02:

Next generation of renewable energy technologies

- Type of action: Research & Innovation Action (RIA)
- EU indicative budget: 33 M€
- EU contribution per project: estimated ~3 M€
- Deadline: 23 February 2022
- Special topic conditions: To achieve TRL 3-4


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HORIZON-CL5-2021-D6-01-10:

Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic System

Scope: Actions should address the **activities on either A or B:**

A) Testing safe lightweight vehicles

B) Safe human-technology interaction in the future traffic system. Proposals should clearly indicate which area they are covering.

Area A –Testing safe lightweight vehicles

… **10% lighter vehicles** …, without reduction of **safety** when crashing with a heavier crash counterpart …. circular use of materials … related **manufacturing concepts** (including casting and 3D printing of complex shapes) … Advanced **testing on crash**, toughness, fracture and fatigue of new materials and concepts ... smart integration of these concepts…

The proposed actions should analyse the crash scenarios … and a mixed traffic situation where **automated and semi-automated** vehicles and normal "manually driven" vehicles share the road.

A significant number of crash tests is expected to be performed for validating the different scenarios.

HORIZON-CL5-2021-D6-01-10:

Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic system

Area B –Safe human-technology interaction in the future traffic system

Avoid info overload to driver or unprotected road user with impacts on road safety.

Human machine interfaces (HMI) with adaptive characteristics continue to be developed and new functionalities are continuously added, yet the impacts of those systems on the behaviour of drivers and other road users are not sufficiently known.

These adaptive HMI systems can support a wide range of traffic users and could be included in scenarios based on the mixed traffic and accidentology where needed. As such the applications are not limited to higher levels of vehicle automation. Therefore, they need to consider a wide variation of human capabilities and reactions as well as long-term mental and physical capacities (including disabilities and disorders) and instantaneous limitations in capabilities (collapse, illness, drowsiness, etc.).

HORIZON-CL5-2021-D6-01-10:

Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic system

In particular, the following aspects should be considered by future research:

- intuitive, understandable, non-distracting and reliable adaptive interfaces for HMI in road vehicles minimising training needs for safe usage.
- concepts of external interfaces, also considering the characteristics (for instance speed, direction) that are possible to interpret and understand by all road users.
- Understand long-term effects (physical and mental), potential risks and possible benefits for road users exposed to and actively using adaptive HMI technologies, and propose means to improve or maintain road user performance in terms of safety.
- Development of safety validation methods for new adaptive HMI technologies.

~~…. specific issues of the interaction of highly automated vehicles with their occupants and other road users are covered in topic HORIZON-CL5-2022-D6-01-02.~~

Social innovation …. when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

HORIZON-CL5-2021-D6-01-10:

Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic system

Expected Outcome: Project results are expected to contribute to the following :

For Area A:

- Safer but also lighter and circular vehicle **structures**.
- Advanced vehicle concepts with higher compatibility between vehicles of different sizes and masses in dissimilar crashes.
- Advanced structural designs tolerant to a wider set of crash angles.
- Demonstration of a minimum number of **crash tests** designed to validate virtual testing for a large number of different scenarios
- Improved **safety** in future mixed traffic scenarios including an increasing number of automated vehicles

For Area B:

- Reduced driver distraction as an important factor in road crashes.
- **Intuitive and unobtrusive information** of drivers and other road users …
- Safer mobility for all road users including the ones with impaired mental and/or physical capacity.
- Availability of human-centric adaptive interfaces and positive stimulation and utilisation of human abilities by new human-technology interfaces.
- Improved **validation** methods for HMI.

HORIZON-CL5-2021-D6-01-10:

Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic system

- Type of action: Research & Innovation Action (RIA)
- EU indicative budget: 12 M€
- EU contribution per project: between ~3.5 and 4 M€
- Deadline: 19 October 2021
- Special topic conditions: To achieve TRL 5-6

Technology Readiness Level

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