

June 9 - 2022

RE: Investors and civil society call for prioritizing climate and energy security in the 2023-24 Horizon Europe Work Programme

Dear Commissioner Gabriel,
Dear Director-General Paquet,

Research and Innovation (“R&I”) has been at the heart of the European project and collaboration since 1984. Horizon Europe is the EU’s flagship R&I funding programme and with its budget of €95.5 billion, it remains a critical yet scarce resource to tackle climate change, and to respond to the changing geopolitical situation.

The 35 % of Horizon Europe that has been earmarked for climate objectives is more necessary than ever. The undersigned organisations urge the Commission to:

1. Support your proposal to increase the transparency of this 35% commitment

Some of the signatories have corresponded with you on this point at the early stages of Horizon Europe’s setting up.

The European Court of Auditors has cast doubt on the appropriateness of the European Commission’s methodology for accounting for climate-related spending ([Special Report 09/2022](#)). Confidence must be restored: people need to know that a commitment to spend money is not just rhetoric. One of the areas of the EU budget subject to a specific climate spending target was Horizon 2020, where out of a sample of 24 projects the ECA found that “that the climate coefficients used for nine [...] were not reasonable, as they had a weaker link to climate action than claimed.”

Transparency is critical to allow researchers and innovators to plan for upcoming calls and make their proposals more competitive.

We propose to add a set of indicators to the Horizon Europe Dashboard that can help assess real-time, as a time-series, how much of the budget of Horizon Europe has been committed, how much has been paid and if the commitments are targeting the climate objectives or other earmarked ambitions. Horizon Europe’s Dashboard should also report the financial envelope for the programme and the indicative distributions under the sub-headings, and track any changes to these figures.

2. Prioritize and include new topics in the 2023-24 work programme, making sure we support the research and develop the technologies we need for energy security and climate neutrality

The next generation of climate technologies can also address Europe’s energy security. As a group, we wish to highlight specific calls for your priority consideration in the 2023-24 work programme that can deliver on these two goals. Looking at the drafts for the current work programme, the undersigned identified which calls they see as the most

ambitious ones for decarbonisation and energy security. [This prioritization list can be found in Annex A to this letter.](#)

We also identified technological gaps in the draft work programme 2023/24 we believe are not sufficiently covered to enable us to transition to a fossil-free union. This list was developed by some of the co-signatories, and by conducting interviews with 15 EU cleantech investment funds from the [Cleantech for Europe coalition](#), which pointed out the gaps they are seeing in the technology stacks they invest in. [The list of gaps is attached to this letter in Annex B.](#)

Finally, Flow Batteries Europe, is pleased to provide a specific recommendation on how they see [HEU supporting the development of cost-effective high performance long term storage systems](#) which is described in detail in Annex C.

Europe has a history of success in scientific endeavors. We must apply the same commitment to addressing climate change and ensuring Europe's energy security. We remain engaged and interested to discuss any of the attached recommendations in further depth.

Your sincerely,



ANNEX A: Recommended Priority Calls from Climate R&I Perspective

Organization	Most prioritized call 1	Most prioritized call 2	Most prioritized call 3
Good Food Institute	HORIZON-CL6-2024-FARM2FORK: Microbiome for flavour and texture in the organoleptic dietary shift	HORIZON-CL6-2023-FARM2FORK: Cultured meat and seafood – state of play and future prospects in the EU	HORIZON-CL6-2023-FARM2FORK: Valorisation of ecosystem services provided by legume crops
Ocean Energy Europe	HORIZON-CL5: D3-1-23. Demonstration of sustainable tidal energy farms	HORIZON-CL5: D3-1-25. Demonstration of sustainable wave energy farms	HORIZON-CL5: D3-1-26. Critical technologies for the future ocean energy farms
Future Cleantech Architects	HORIZON-CL5: D3-2-17. Development of novel long-term electricity storage technologies	HORIZON-CL5: D3-2-18. Demonstration of innovative seasonal heat and/or cooling storage technologies	HORIZON-CL5: D2-1-7. Hybrid electric energy storage solutions for grid support and charging infrastructure
Environmental coalition of standards	HORIZON-CL4-2023-TWIN-TRANSITION-01-36: Modeling of EU industry decarbonisation (Processes4Planet partnership) (RIA)	HORIZON-CL4-2024-TWIN-TRANSITION-01-41: Breakthroughs to improve process industry resource efficiency (Processes4Planet partnership) (RIA)	HORIZON-CL4-2023-TWIN-TRANSITION-01-37: Hubs for circularity for near zero emissions regions applying industrial symbiosis and cooperative approach to heavy industrialized clusters and surrounding ecosystems (Processes4Planet partnership) (IA)
Transport and Environment	D2-1-3. Advanced materials and cells development enabling large scale production of Gen4 solid-state batteries for mobility applications	D2-1-4. Sustainable high-throughput production processes for stable lithium metal anodes for next generation batteries	D2-1-10. Advanced sustainable and safe pre-processing technologies for End-of-Life (EoL) battery recycling

Transport and Environment	D3-1-14. Demonstration of synthetic renewable fuel technologies for aviation and shipping (2023)	D3-3-2: CCU for the production of fuels	D3-1-18. Development of next generation synthetic renewable fuel technologies (2024) 140
Environmental coalition of standards	HORIZON-CL4-2023-TWIN-TRANSITION-01-36: Modeling of EU industry decarbonisation (Processes4Planet partnership) (RIA)	HORIZON-CL4-2024-TWIN-TRANSITION-01-41: Breakthroughs to improve process industry resource efficiency (Processes4Planet partnership) (RIA)	HORIZON-CL4-2023-TWIN-TRANSITION-01-37: Hubs for circularity for near zero emissions regions applying industrial symbiosis and cooperative approach to heavy industrialized clusters and surrounding ecosystems (Processes4Planet partnership) (IA)
Flow Batteries Europe	D2-1-6. BMS and battery system design for stationary energy storage systems (ESS) to improve interoperability and facilitate the integration of 2nd life of batteries, if applicable	D2-1-13. Non-Li Sustainable Batteries with European Supply Chains for Stationary Storage	D2-1-14. Computer-aided design and development of materials for next-generation redox flow batteries

ANNEX B: Topics to be considered for the 2023-24 Work Programme

- **Electricity/ energy**
 - Electricity to liquid fuels, a critical technology overlapping several challenges
 - Tidal and wave energy
 - *Business model play* Demand response and dispatch
 - *Business model play* Deployment of renewables (alignment of interest between owner and tenant, financing option, etc..)
 - Long-duration Energy Storage in all forms (intra-day, - intra-day (>8h), multi-day and seasonal)
 - Technologies to upgrade our electricity grid, including software for mapping and flexibility, and hardware such as high temperature superconductor (HTS)
 - Innovations in energy efficiency households, communities and businesses
 - Energy citizenship: financial, legal and social innovations that help build local community support to energy efficiency and renewable energy projects

- **Manufacturing / industry**
 - Decarbonization of semi-conductor production
 - Production of net zero ammonia and commodity chemicals
 - CO₂-to-X : converting captured CO₂ into valuable chemicals
 - Circularity of materials in industrial settings
 - Low-clinker cement and other low-carbon cement pathways, excluding CCUS
 - CO₂-negative cement
 - Substitution of concrete
 - Recycling/reuse of cement/concrete
 - Electrification of process heating (cross-industry)
 - Green steel (electrolysis technologies, electrowinning, hydrogen DRI,)
 - Decarbonization of chemicals including through: Mechanical recycling and Chemical recycling
 - Direct air capture of CO₂
 - Frugal innovation for the manufacturing of resilient, durable and energy efficient products.

- **Agriculture**
 - Natural carbon sinks: ocean based solution (e.g: phytoplankton, kelp forest), soil microbial treatments to sequester further carbon
 - Soil carbon measurement and verification technologies, enabling business models
 - Tackle the emissions arising from manure & bovines in general (e.g.: asparagopsis might be forbidden)
 - Low GHG fertilizers
 - Low carbon rice culture
 - Improvement in cultures resilience and yield without depleting soil (e.g.: microbial treatment)

- Technological development of cultivated meat and improving the taste and texture, and reduce cost of low carbon plant-based meat, egg, dairy, and seafood for human consumption
- **Transportation:**
 - Low carbon liquid fuels: e-fuels, fuels derived from algae or sugars
 - *Business model play*: Mode shift/ efficiency : from long haul truck to rail for instance, from private cars to public transportation
 - Solution to allow container ship & bulk carrier to switch to sustainable fuels
 - New maritime transport means, such as sail-based ships
 - Hydrogen based aviation and electric aviation
- **Building:**
 - Net zero constitutive/raw material
 - Sustainable heating and cooling technologies (efficiency and absence of refrigerant gas)
 - *Business model play*: accelerate adoption of cleantech in built environment
 - Modular off site construction
 - Timber-based construction
 - Industrialization of renovations

Annex C: Proposed support to develop cost effective high performance long-term energy storage systems

We are aware that this topic was foreseen for the WP25 in the Batt4EU Strategic Research and Innovation Agenda (Strategic Action 2, page 68). However, given the current political context, we think that long-duration storage technologies are critical to ensure the achievement of security of supply without jeopardising the goals of decarbonisation. Therefore, bringing this topic into the WP23-24 would be better.

On behalf of Flow Batteries Europe, you can find an example of how the call could look like. However, we would very much value the input of the European Commission and the experts from the Batt4EU partnership.

Expected EU contribution per project: The Commission estimates that an EU contribution of 10 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Indicative budget: The total indicative budget for the topic is EUR 20 million.

Type of action: Innovation Action

Technology readiness level: TRL 7-8 by project-end

The following are key evidence and outcomes:

Studies show that for a 100% renewable-based energy system, more long-duration storage options will be needed. However, currently these long-duration battery systems receive significantly less attention and funding both at private and public levels, which makes their scale-up difficult. And yet, scaling-up non-lithium ion battery production is crucial to achieve the necessary cost reductions for long-duration battery technologies to ensure their take-up at a level sufficient to achieve security of supply. Many of the long-duration batteries also have considerable sustainability and safety benefits.

A demonstration is needed to deliver a front-end engineering design of a large-scale post-lithium ion battery, which allows to extrapolate the design of commercial and other relevant arrangements to build and operate a Gigafactory of the said battery. The aim of this call is to demonstrate the said battery technology and its operation and provide a viable technology base for the construction of large-scale manufacturing facilities. This would allow to make the prototype batteries at a scale sufficient enough to achieve economy of scale and lead to cost reductions of producing the battery.

Credible projected storage costs of less than €0.05 /kWh/cycle based on a nominal 16-20-hour cycle time by 2030, where energy can remain stored in a cycle for several days to a few months;

Projected product cycling life of at least 5,000 cycles and 15 years, when in the battery's recommended use pattern,

Demonstration of system at scale, not less than 20 MW and 100 MWh whose complete system safety can be maintained across a wide range of ambient conditions operated in end-user conditions for more than 3,000 hours;

A clear route for a feasible, European-based supply chain;

A credible engineering design and cost analysis for the battery technology's Gigafactory in Europe;

A defined concept for demonstrable, highly sustainable, circular manufacturing for the selected battery type, with sustainability measured in terms of recognised economic, environmental, social and ethical metrics.

Scope: This topic is open to all post-lithium ion long-duration battery chemistries.

Projects must: develop and demonstrate an innovative post-lithium ion battery technology with energy density and power metrics suited to stationary energy storage applications, as well as independent scalability of power and capacity; and prove the battery system's sustainability and compatibility with a European supply chain.

In particular, projects must:

Develop and demonstrate sustainable and safe post-lithium ion battery solutions that can be deployed in a large share of the energy storage markets;

Develop a design for a Gigafactory of the technology that is being investigated, including engineering plan and cost analysis;

Show how cell and system design and material improvements optimise techno-economic performance by defining (i) technical and commercial targets, and (ii) quantified success criteria/KPIs by which progress toward achieving the targets will be evaluated during both development and validation phases of the project;

Demonstrate a credible commercial and technical path, from end-of-project outcomes to a stationary-energy-storage product, and which takes account of future manufacturing and recycling requirements.

Provide evidence of current and future sustainability, viable European supply chains and rigorous analyses of the complex sustainability and recyclability issues including compatibility with regulation, including recycling regulations.

BMS development is within scope where relevant, but should not be the main focus of the project.