European Commission

#HorizonEU

THE EU RESEARCH & INNOVATION PROGRAMME

2021 – 2027

Horizon Europe Cluster 5 Info Day

3 February 2022

Research and Innovation

EUROPEAN UNION

CLUSTER 5 Climate, Energy & Mobility

INFO DAY 2022 - 3 February 2022

WELCOME

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THE EU RESEARCH & INNOVATION PROGRAMME 2021 - 2027

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3. Ask your question or vote for an existing one

European Commission

CLUSTER 5 Climate, Energy, Mobility

Virtual INFO DAY 2022
3 February 2022

Parallel sessions – 11:20 – 13:00

Destination 2 A competitive and sustainable European battery value chain; Communities & Cities

Destination 5 Zero-emission road transport

Follow the streaming link: **https://europa.eu/!UmC7FF**

Destination 3 - Energy systems, grids and storage

Destination 5 - Aviation

Destination 2 - Communities & Cities

Follow the streaming link: https://europa.eu/!UmC7FF

European Commission

CLUSTER 5 Climate, Energy, Mobility

Virtual INFO DAY 2022 – 3 February 2022

Destination 2

A competitive and sustainable European battery value chain

Destination 5

Zero-emission road transport

11:20 – 13:00

European Commission

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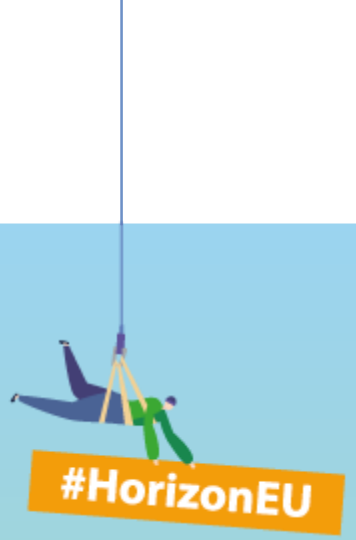
CLUSTER 5

CLIMATE

ENERGY

MOBILITY



HORIZON EUROPE

INFO DAYS 2021

BATTERIES WORK PROGRAMME 2022

HORIZON-CL5-2022-D2-01

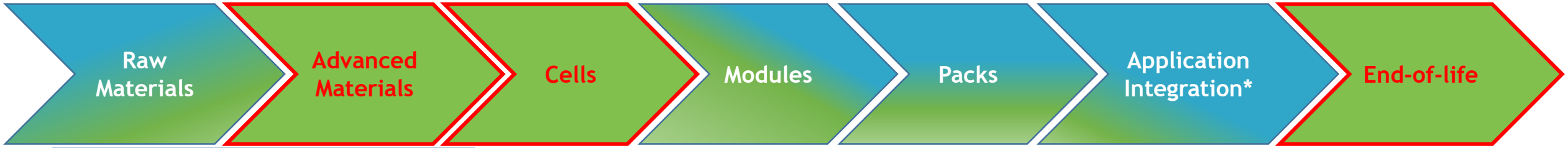
Johan BLONDELLE

Policy Officer, DG RTD.C.2

Future and Urban Mobility Systems

2021 – 2027

Batt4EU – covering the full value chain



- Active material and related components (battery-grade raw materials, cathodes, anodes, binders, electrolytes (particularly solid-state future electrolytes), the processes and equipment to manufacture them, and novel methods for accelerated discovery and engineering of materials and interfaces)
- Other materials (separators, casing, mechanical components,…)

- Cell design
- Advanced technologies for manufacturing
- Specialised equipment for new manufacturing technologies…
- Assembly technologies
- …

- Decarbonised transport
- Stationary energy storage.

**For applications sectors with a dedicated partnership, this dedicated partnership will take the lead on the downstream R&I segments activities specific to this sector*

- Re-use
- Collecting, sorting, dismantling and recycling
- Secondary raw materials
- …

Appropriate balance between short-to-medium term and long-term R&I activities

- enhancement of close-to-market Li-ion technologies (TRL 5-8)
- new promising and longer-term breakthrough technological solutions (TRL 2-4)

Battery Topics 2022

- All battery topics fall under Partnership Batt4EU
- Private side represented by Batteries European Partnership Association (BEPA), https://bepassociation.eu/
- Topic creation:
  - Co-creation group inside Commission
  - Collaboration European Technology & Innovation Platform (ETIP) Batteries Europe + Battery 2030+
  - Full inter-service consultation process + Member States consultation
  - Jointly agreed Strategic Research & Innovation Agenda
- No need to be a member of BEPA – calls are fully open
- NB: topic presentation not exhaustive – please refer to full call text!

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

HORIZON-CL5-2022-D2-01-01

Sustainable processing, refining and recycling of raw materials

Scope

Enabling European graphite production with vertical integration into European battery production

- Development of solutions for **combined use** of natural and synthetic graphite
- For both natural and synthetic graphite:
  - Improve performance characteristics, reduce environmental impact
- For **synthetic graphite**:
  - Develop other available European options like **biobased anode carbon** and **by-products from anode material** as raw material
  - Processes for production from **natural gas pyrolysis**
  - Reduction of **process discharge and emissions**

European Commission

HORIZON-CL5-2022-D2-01-01

Sustainable processing, refining and recycling of raw materials

Expected outcome

- **Decreased dependency** on imported battery grade graphite, decreased risk for supply chain
- Graphite **competitively** produced and refined in Europe in **sustainable** and **socially acceptable** way
- Leverage potential for **fast charging**
- Reduced **carbon and environmental emissions** from anode material supply chain

Synthetic:

- **System prototype demonstration** of high-performance battery grade graphite, improved yield and lower environmental footprint
- Longer-term: develop **biocarbon alternatives**

Natural:

- **Advanced refining**, improved yield and lower environmental impact

European Commission

HORIZON-CL5-2022-D2-01-01

Sustainable processing, refining and recycling of raw materials

ACTION TYPE	Innovation Action (IA)
TECHNOLOGY READINESS LEVEL (TRL)	6-7
BUDGET OF TOPIC	10 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	2
OTHER REMARKS	Projects are expected to contribute to European Raw Materials Alliance objectives.

European Commission

HORIZON-CL5-2022-D2-01-02

Interface and electron monitoring for the engineering of new and emerging battery technologies

Scope

- Support the development of novel **experimental and computational** techniques targeting the time and length scales of **interface reactions** in a battery cell including electron and ion localisation, mobility and transfer reactions
- Development of novel analytical techniques, supported by modelling and simulation, able to **follow interface, electron and ion dynamics** in battery materials and battery cells, and carefully selecting controlled **model systems** to implement those novel techniques
- Give advice and new insights on how to increase the **life time and safety** of new emerging technologies

European Commission

HORIZON-CL5-2022-D2-01-02

Interface and electron monitoring for the engineering of new and emerging battery technologies

Expected outcome

To contribute to all of the bullets below:

- New methods for studying electrode/electrolyte interfaces for **liquid-based** electrolytes and batteries and for studying **solid-state and buried interfaces**.
- Models for explaining the **degradation** of battery interfaces.
- Deeper understanding of the **formation and evolution of battery interfaces**, leading to new insights on how to increase the lifetime and safety of new and emerging battery technologies, and therefore contributing to the long-term competitiveness of the European battery industry.

HORIZON-CL5-2022-D2-01-02

Interface and electron monitoring for the engineering of new and emerging battery technologies

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	3-4
BUDGET OF TOPIC	10 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	2
OTHER REMARKS	The proposal should also cover the contribution and collaboration to the BATTERY 2030+ large scale initiative

European Commission

HORIZON-CL5-2022-D2-01-03

Furthering the development of a materials acceleration platform for sustainable batteries (combining AI, big data, autonomous synthesis robotics, high throughput testing)

Scope

- **Infrastructure tools** for secure remote data access, data analysis and predictive modelling: Findable, Accessible, Interoperable, Reusable data infrastructure
- **Automated high throughput characterisation** and integrated **experimental and computational** workflows: using standardised battery cells and protocols to perform screening of new materials
- **Autonomous synthesis robotics and orchestration** software: partially autonomous systems with standard synthesis routes + AI-based orchestration and optimization software
- **Inverse design and AI-assisted scale-bridging models** for multiple time- and length-scale processes: covering atomistic and mesoscopic processes, incorporating sensing
  data to estimate state of system + diagnosis and prediction

HORIZON-CL5-2022-D2-01-03

Furthering the development of a materials acceleration platform for sustainable batteries (combining AI, big data, autonomous synthesis robotics, high throughput testing)

Expected outcome

To contribute to all of the bullets below:

- Develop new tools and methods for significantly **accelerating** the development and optimisation of **battery materials and interfaces**.
- Demonstrate a **fully autonomous battery-MAP** capable of integrating computational modelling, materials synthesis and characterisation of both **Li-ion and beyond Li-ion** chemistries.
- **Scale-bridging, multi-scale battery interface models** capable of integrating data from embedded sensors in the discovery and prediction process.
- Community wide state-of-the-art **collaborative environment** to access data and utilise automated workflows for integrated simulations and experiments on heterogeneous sites.
- **Demonstrate a robotic system** that is capable of material synthesis for inorganic, organic or hybrid compounds.
- Deploy **predictive hybrid physics- and data-driven models** for the spatio-temporal evolution of battery interfaces and **demonstrate inverse design** of a battery material/interface.

HORIZON-CL5-2022-D2-01-03

Furthering the development of a materials acceleration platform for sustainable batteries (combining AI, big data, autonomous synthesis robotics, high throughput testing)

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	3-4
BUDGET OF TOPIC	20 M€
EXPECTED EU CONTRIBUTION PER PROJECT	20 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	1
OTHER REMARKS	The proposal should also cover the contribution and collaboration to the BATTERY 2030+ large scale initiative

European Commission

HORIZON-CL5-2022-D2-01-04

Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design

Scope

Machine Development: TRL 3→6

- Locally developed and built equipment
- Minimise **energy consumption**, eliminate air and water **pollution**
- High productivity levels, **intelligent QC systems + Industry 4.0**

Plant site integration and optimisation: TRL 6→7

- Reduction/utilisation of **low-carbon, low-emission energies**
- **Horizontal integration** of EU supply chain for battery process equiment into giga-scale battery cell production

- **Linking** industrial manufacturing, equipment manufacturers, material and other sectors
  → sector coupling, ecological impact
- Stimulate and intensify collaboration between **pilot line operators (LiPLANET)**

European Commission

HORIZON-CL5-2022-D2-01-04

Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design

Expected outcome

To contribute to all of the bullets below:

- **Strengthening** Europe's battery cell industrial manufacturing value chain
- Development of **new battery cell manufacturing machinery**, with priority on minimising energy needed for cells production, enhancement of plant efficiency rates and integration of intelligent control processes
- Enabling **deeper collaboration** between (i) process equipment companies (ii) industrial-scale cell manufacturing, (iii) material, energy and other supply chain sectors benefitting from **sector coupling**
- To stimulate and intensify the collaboration between **pilot line operators**, industrial-scale academia, cell manufacturing companies and European equipment companies

HORIZON-CL5-2022-D2-01-04

Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design

ACTION TYPE	Innovation Action (IA)
TECHNOLOGY READINESS LEVEL (TRL)	6-7
BUDGET OF TOPIC	15 M€
EXPECTED EU CONTRIBUTION PER PROJECT	7-8 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	2
OTHER REMARKS	Link to LiPLANET Network

European Commission

HORIZON-CL5-2022-D2-01-05

Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications

Scope

- Adaptation of **battery system design** to novel cell chemistries for **short-to-medium term** (advanced Li-ion or solid-state)
- Enhance cell-to-system **volume ratio and/or weight ratio**
- New technologies (system materials, mechanical design, electrical architectures, thermal management…) for enhancing **performance and safety**
- **Manufacturability and recyclability** to be explicitly addressed, incl carbon footprint
- Develop and assess methodologies to ensure **safety** throughout full battery lifetime
- Focus on **battery system level**, incl mechanical, electrical and thermal aspects
- **Integration** into applications/vehicles **out of scope**, but prepare for use cases
- Outcomes to be applicable to one or several use cases for transport/mobile applications, **maximising impact**

European Commission

HORIZON-CL5-2022-D2-01-05

Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications

Expected outcome

To contribute to all of the bullets below:

- **Next-generation** battery system technologies for electrification of a broad range of **transport and mobile applications** (including road, waterborne, airborne, and rail transport, as well as non-road mobile machinery).
- Demonstrating **increased performances** (energy density, power density, lifetime) and **safety** of battery systems, to improve the competitiveness of the European battery industry in the transport market.
- **Novel design and process to reduce cost** of manufacturing, refurbishment, dismantling and recycling of battery systems.

HORIZON-CL5-2022-D2-01-05

Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	5
BUDGET OF TOPIC	15 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	2 (?)
OTHER REMARKS	

European Commission

HORIZON-CL5-2022-D2-01-06

Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells)

Scope

- Embed **sensors and self-healing functionalities** into single cells, to detect defects and trigger self-repair through BMS
  - Sensors capable of continuous long-term operation within cell
  - Self-healing to be triggered through external stimulus
- Adapted to detection of **critical degradation processes**, different chemistries
- **Demonstrate proof-of-concept** of coupling sensors and self-healing agents via BMS
- **Benefit** of integration to be demonstrated, compatible with **mass production**
- Estimate **quality, reliability and life** (QRL) over life span
- Demonstrate **advantage over alternatives** (replace, recycle, second use…)

HORIZON-CL5-2022-D2-01-06

Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells)

Expected outcome

To contribute to all of the bullets below:

- Increased **quality, reliability and life** (QRL) of the battery system by integrating both **sensing and self-healing** functionalities at the battery cell level.
- **Disruptive battery cell and battery management system technologies**, to support a competitive and sustainable battery manufacturing industry in Europe.

HORIZON-CL5-2022-D2-01-06

Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells)

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	2-4
BUDGET OF TOPIC	15 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	3
OTHER REMARKS	The proposal should also cover the contribution and collaboration to the BATTERY 2030+ large scale initiative

European Commission

HORIZON-CL5-2022-D2-01-07

Digitalisation of battery testing, from cell to system level, including lifetime assessment

Scope

- Novel methods and tools to **accelerate and improve battery testing**
- **Multi-scale** approach, from cells to systems (excl power converters)
- Propose and validate new concept based on
  - Intelligent design of **experiment**
  - Smart combination of **physical and virtual testing**
  - **Hardware in the loop**
  - Development and use of **advanced models for cells and systems** and relevant evolution in use conditions
- Particular attention to battery **lifetime, reliability and safety**, incl development of methods for testing of safety in usage and transport
- Ambition for **cross-sectorial** applications
- Focus on current or near-term (**advanced Li-ion**) but quickly adaptable to solid-state

European Commission

HORIZON-CL5-2022-D2-01-07

Digitalisation of battery testing, from cell to system level, including lifetime assessment

Expected outcome

To contribute to all of the bullets below:

- **Competitiveness** of the European battery industry **across the value chain** (from cell manufacturers to cell integrators);
- **Shorter time-to-market**;
- **Reduced time and/or cost** of battery development by at least 20% to 30%;
- Improved battery design, for **longer lifetime, and better reliability and safety**;
- Reduced **investment and operational costs** of battery systems.

European Commission

HORIZON-CL5-2022-D2-01-07

Digitalisation of battery testing, from cell to system level, including lifetime assessment

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	5-6
BUDGET OF TOPIC	15 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	3
OTHER REMARKS	

European Commission

HORIZON-CL5-2022-D2-01-08

Coordination of large-scale initiative on future battery technologies

Scope

- Coordinate **Battery 2030+** and its contributions to broader efforts in battery technologies
- Tackle **long-term research challenges** to result in game-changing impacts
- Long-term, coordinated and sustained effort at EU level through ambitious research agenda
- **Coordinate** research activities and stakeholders
- Facilitate **communication**, dialogue and cooperation on crosscutting topics
- Monitor progress and update **roadmap**
- Support **governance**
- Establish **knowledge base**
- **Promote and communicate** objectives and achievements
- Identify **training and education** needs, promote curricula
- Identify and coordinate **modelling and data sharing, standardisation, IP**
- **Networking and collaboration** with other activities, esp. ETIP Batteries Europe
- Driven by **relevant actors** in the field

European Commission

HORIZON-CL5-2022-D2-01-08

Coordination of large-scale initiative on future battery technologies

Expected outcome

To contribute to all of the bullets below:

- Fostering the **scientific, technological, economic and societal impact** of the initiative and paving the way to **industrial exploitation** of future battery technologies in key energy and transport application domains.
- Well-coordinated European research initiative on future battery technologies **gathering excellent scientists and innovators** as well as involving other relevant stakeholders and **linked** with relevant international, national and regional programmes.
- **Spreading of excellence** in future battery technologies across Europe, increased **awareness** of European activities and availability of European **curricula** in the field.
- Increased **synergies and collaboration** between the relevant research and innovation stakeholders in Europe as well as with major initiatives that already exist or are under preparation.

HORIZON-CL5-2022-D2-01-08

Coordination of large-scale initiative on future battery technologies

ACTION TYPE	Coordination and Support Action (CSA)
TECHNOLOGY READINESS LEVEL (TRL)	NA
BUDGET OF TOPIC	3 M€
EXPECTED EU CONTRIBUTION PER PROJECT	3 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	1
OTHER REMARKS	

European Commission

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

Scope

- Develop innovative physics- and data-based approaches, both at **software and hardware** levels to ensure **optimised and safe utilisation** during all modes of operation
- **Next-generation more powerful BMS**, acquiring/communicating/analysing large amount of data → Dynamic update of battery usage limitations + widen operating range
- **Open access to FAIR data** → degradation models + predictive maintenance and EOL management
- Develop technologies at HW + SW level, **validation through lab-scale prototype** at TRL 4
  - Physics-based battery models (e.g. ageing phenomena)
  - Adaptable battery models (using operation data)
  - Sensor-based solutions at system level
  - Advanced state estimators
  - Prediction of useful lifetime, failures, special situations
- **Transport or stationary** applications

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

Expected outcome

To contribute to all of the bullets below:

- New **physics and data-based approaches** for battery management, with the potential to enhance **performances, lifetime, reliability and safety** of battery systems for transport and stationary applications.
- New physics and data-based approaches for battery management facilitating **predictive maintenance, and/or knowledge-driven end-of-life management** of battery systems, and/or the development of more accurate **degradation models**.

European Commission

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	4
BUDGET OF TOPIC	15 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	3
OTHER REMARKS	The selected projects are invited to participate to BRIDGE activities when considered relevant.

European Commission

HORIZON-CL5-2022-D2-01-10

Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling

Scope

- Development of **standardised common diagnostics protocols and cut-off criteria** between product (2nd life application) and waste (recycling).
- Elaborate critical stage of diagnosis of batteries as a waste-prevention measure.
- **Automate the dismantling** of E-mobility and stationary batteries.
- Development of novel safe **dismantling processes and safety procedures**
- Development of technologies preventing or reducing **thermal runaway**.
- Design and demonstration of standardised and cost-efficient **storage and transportation containers**.
- Development of technologies for fast and efficient **discharge of used batteries**.
- Development of standardised **battery labelling system**.
- Research on batteries **sorting and dismantling** technologies.
- Identify all potential risks and develop **safe processes and safety procedures**.

European Commission

HORIZON-CL5-2022-D2-01-10

Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling

Expected outcome

To contribute to all of the bullets below:

- Achieving the objectives of the **Circular Economy Action Plan** by enabling **second life** of batteries and increasing rates for **recycling and recovery**, in line with upcoming regulatory requirements.
- Revolutionise and re-fresh recycling industry, by applying best-in-world innovations based on **automatisation, efficiency and sustainability**.
- Create **new circular business models**, such as second life, to reduce the need for primary raw materials, and to maximize the use of battery cells reducing the cost per cycle.
- Develop a **community for actors** involved in the management of the recycling value chain for batteries (including second life) for **sharing best practices** (health and safety, transport, dismantling, refurbishing, recycling).
- **Improve safety**, through automatisation and reducing accidents.

European Commission

HORIZON-CL5-2022-D2-01-10

Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling

ACTION TYPE	Research & Innovation Action (RIA)
TECHNOLOGY READINESS LEVEL (TRL)	5-7
BUDGET OF TOPIC	15 M€
EXPECTED EU CONTRIBUTION PER PROJECT	5 M€
NUMBER OF PROJECTS EXPECTED TO BE FUNDED	3
OTHER REMARKS	The selected projects are invited to participate to BRIDGE activities when considered relevant. **https://www.h2020-bridge.eu/**

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Thank you!

HorizonEU

http://ec.europa.eu/horizon-europe

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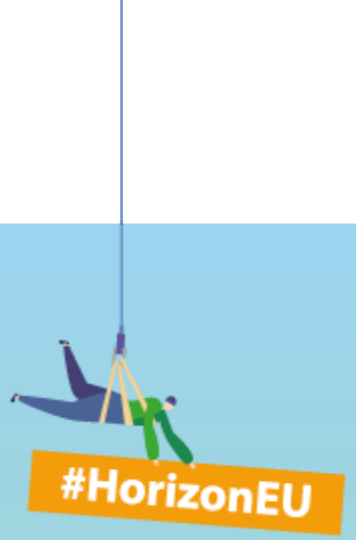
CLUSTER 5

CLIMATE

ENERGY

MOBILITY



HORIZON EUROPE

INFO DAYS 2021

DESTINATION 5 – 2ZERO

Guido SACCHETTO

Policy Officer, DG RTD Unit C2

2021 – 2027

HORIZON-CL5-2022-D5-01-08

Modular multi-powertrain zero-emission systems for HDV (BEV and FCEV) for efficient and economic operation (2ZERO)

Scope

- **Modular and flexible powertrain** approach for large HDV serving varying mission demands (range, power and re-charging/-fuelling requirements) within **one vehicle platform**.
- Open to either **pure BEV/FCEV or hydrogen FC range extended battery vehicles**, exploiting the scalability and modularity of the installed power units to allow cost efficient solutions.
- At least **2 different prototypes** covering **two different missions** under operational conditions: one mandatorily for long haul freight transport, while the additional prototype(s) open to **Vehicle Group 4, 5, 9, 10, 11 or 12 of VECTO, GVW of minimum 40 tons** under operational conditions comparable to the VECTO regional mission profile, and/or long distance coach(es).
- Applicants should go beyond activities of topic HORIZON-CL5-2021-DEST5-CCT-01-01, avoiding duplication of activities already performed under this topic, as well as of activities developed by ongoing Fuel Cell and Hydrogen Joint Undertaking projects.

(More details are defined in the Topic text)

European Commission

HORIZON-CL5-2022-D5-01-08

Modular multi-powertrain zero-emission systems for HDV (BEV and FCEV) for efficient and economic operation (2ZERO)

Expected outcome

Projects' results are expected to contribute to **ALL of the expected outcomes:**

- Demonstration of the capability to cover **750 km real unrefuelled/unrecharged range** with high efficiency long haul HDV truck-trailer combinations.
- Demonstration of concepts over **at least 6 months in real world conditions** involving manufacturer(s), energy provider(s), electric and hydrogen infrastructure manufacturers/operators and end users from across Europe, covering **at least 500 km average daily operation** in real conditions – in line with drive and resting time regulation.
- **ZEV-specific, flexible, managerial tools** supporting the integration of zero tailpipe emissions vehicles into fleets and facilitating the assignment of tasks and routes (based on infrastructure, range, charging time, payload etc.).
- Contribute to **significant price reduction , leading toTCO equality** with 2020 engine-based solutions with production volume of >= 10.000 pieces/year

European Commission

HORIZON-CL5-2022-D5-01-08

Modular multi-powertrain zero-emission systems for HDV (BEV and FCEV) for efficient and economic operation (2ZERO)

Type of action: HORIZON Innovation Actions

EU contribution: EUR 15.00 to 20.00 million per project

Deadline: 26 April 2022 17:00:00 Brussels time

European Commission

HORIZON-CL5-2022-D5-01-09

Nextgen EV components: High efficiency and low cost electric motors for circularity and low use of rare resources (2ZERO)

Scope

Electrical machines are a fundamental part of zero emission powertrains for all vehicles classes, but the **target of this topic is the core market (with powertrains of 50-120kW continuous power).**

- Increase **primary efficiency**, in particular by widening the high efficiency area and compactness.
- Increase **high system voltages** offering new opportunities for readdressing the current versus voltage trade-offs.
- Guarantee the **heat rejection of high energy density motors** through multiphysics models in order to reach an optimal design (low use of rare resources, reduction in losses, high efficiency).
- **Novel manufacturing process** supporting increased integration, enabling, amongst other things, improved thermal control.
- Use as far as possible of **alternative architectures and materials** to the current rare earths-based magnets and configurations.

(More details are defined in the Topic text)

European Commission

HORIZON-CL5-2022-D5-01-09

Nextgen EV components: High efficiency and low cost electric motors for circularity and low use of rare resources (2ZERO)

Expected outcome

Projects' results are expected to contribute to **ALL of the expected outcomes**:

- **Lower cost, higher efficiency and power density electric motors for mass produced LDV**, with a design-to-X approach for easy dismantling and recyclability, and a reduced use of (rare) resources through development/application of alternative materials or advanced configurations.
- **Lower EV cost and improved range** for a wider market penetration.
- **Improved motor design and development processes**, considering a full product life-cycle assessment in a circular economy environment (mandatory recycling research on critical materials if these are used).
- European **job creation/retention** by developing a world-leading design and production base, including supplying SMEs.

European Commission

HORIZON-CL5-2022-D5-01-09

Nextgen EV components: High efficiency and low cost electric motors for circularity and low use of rare resources (2ZERO)

Type of action: **HORIZON Research and Innovation Actions**

EU contribution: **EUR 3.00 to 6.00 million per project;** If critical raw materials (CRM) are included in the design, the development of processes for the economic recycling of at least 60% of any rare materials needs to be included: only this additional work will justify the use of up to EUR 2 million of the expected EU contribution.

Deadline: **26 April 2022 17:00:00 Brussels time**

European Commission

HORIZON-CL5-2022-D5-01-10

New generation of full electric urban and peri-urban Bus Rapid Transit systems to strengthen climate-friendly mass transport (2ZERO)

Scope:

The focus of topic is on full electric Bus Rapid Transit (e-BRT) systems using **full size buses (M3).** Demonstration and testing in **real operation in 4-5 European cities and at least 1 city in a partner country** in a developing context (Africa or Latin American and Caribbean countries). Proposals shall address **ALL the following**:

- **Electrification combined with automation and connectivity enablers**, to optimize and validate the whole advanced BRT system.
- **Operational concepts**: increasing the capacity use rate; the average commercial speed; punctuality / regularity.
- **Synchronization** with other city transport modes; service quality whilst reducing CO2 emissions, and cost per km/passenger.
- **Replicability:** use of the e-BRT technology under environmental, infrastructure and social conditions different from the European ones.
- (More details are defined in the Topic text)

European Commission

HORIZON-CL5-2022-D5-01-10

New generation of full electric urban and peri-urban Bus Rapid Transit systems to strengthen climate-friendly mass transport (2ZERO)

Expected outcome

Projects' results are expected to contribute to **ALL of the expected outcomes:**

- Development of next generation **innovative effective public transport systems** through e-BRT.
- Efficient, **economically viable and flexible, integrated solutions of e-BRT** within existing mass transport networks (all modes) and with personal mobility solutions.
- **Innovative, integrated, infrastructure solutions** combining charging, bus-stops and dedicated bus lines, for both urban and peri-urban road networks.
- Development of **flexible bus transport, end-user solutions**, for both urban use in dense city centres and for less populated peri-urban environments.
- Development of an **international market** for European e-BRT systems, in particular, in countries with low offer of public transport with challenging conditions (climate, environment, poverty, etc.).
- **Reduction of greenhouse gas and pollutant emissions** as well as traffic congestion

European Commission

HORIZON-CL5-2022-D5-01-10

New generation of full electric urban and peri-urban Bus Rapid Transit systems to strengthen climate-friendly mass transport (2ZERO)

Type of action: **HORIZON Innovation Actions**

EU contribution: **EUR 25.00 million per project;**

Deadline: **26 April 2022 17:00:00 Brussels time**

European Commission

HORIZON-CL5-2022-D5-01-11

Stimulating Road Transport research and innovation dissemination and implementation in Europe and around the World

Scope:

The aim of this topic is to promote sustainable road transport in EU and at international level, contribute to the European Research Area, and EU strategies for future transport systems:

- **Organisation of events, conferences, workshops and dissemination activities** to foster innovation aspects of road transport research and innovation;
- Identification of support actions in particular in the fields of **education, training and skills** at European level and standardisation and business models – mainly at EU level;
- Foster **links between EU, national and regional programmes** for road transport research, supporting coordination of activities with Member States;
- Facilitate **exchange between Europe and emerging economies in particular within Africa, Asia and Latin America**;
- Identification of **barriers for the deployment** of R&I results and **pre-feasibility studies** (e.g. “Urban zero-emission mobility”, “Air quality and climate change”, “Road safety”;)
- Updating and coordinating **research agendas and roadmaps.**

European Commission

HORIZON-CL5-2022-D5-01-11

Stimulating Road Transport research and innovation dissemination and implementation in Europe and around the World

Expected outcome

Projects' results are expected to contribute to **ALL of the expected outcomes:**

- Strengthen and widely **promote research and innovation activities**, including among the **public/civil society**, via road transport dedicated events;
- **Identify, highlight and disseminate the contribution from road transport,** in particular on zero tailpipe emission solutions;
- Comprehensive **overview of international developments** on road transport research;
- **Cooperation with road transport related national and international organizations** and support of international EU activities in line with the UN Sustainable Development Goals;
- Contribute to **identifying and analyse research and innovation areas** for the future of road transport in the EU.

European Commission

HORIZON-CL5-2022-D5-01-11

Stimulating Road Transport research and innovation dissemination and implementation in Europe and around the World

Type of action: **HORIZON Coordination and Support Actions**
Cross-cutting Priorities: Africa, International Cooperation

EU contribution: **EUR 2.00 million per project;**

Deadline: **26 April 2022 17:00:00 Brussels time**

European Commission

Thank you!

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