

earpa

RECHARGE



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- During the Q&As (if time allows): please post your questions in the chat. If you would like to speak, please raise your hand (by clicking on « ... » in « Participants »).
- □ The slides will be shared with participants after the meeting.
- □ If you encounter any technical issue, please send a message in the chat.





Agenda

Partnership

<u> </u>	
TIME	ITEM
13:30-13:40	1. Welcome & Introduction: the BATT4EU Partnership
13.40-14.00	2. Introduction of the Horizon Europe battery calls for 2022
14:00-14:10	3. Introduction of the BEPA match-making tool
14:10-15:25	 4. Pitching session – Part 1 Several members of European battery associations and initiatives will present their project idea or concept for a specific Horizon Europe call (5mn per speaker). Pitches – 60mn' Q&A session – 15mn'
15:25-15:40	5. Coffee Break
15:40-15:50	6. Reminder about the match-making tool
15:50-16:45	 7. Pitching session – Part 2 Several members of European battery associations and initiatives will present their project idea or concept for a specific Horizon Europe call (5mn per speaker). Pitches – 40mn' Q&A session – 15mn'
16:45-17:00	8. Closing remarks
	Co-funded by



Welcome & Introduction: the BATT4EU Partnership





Reminder: what is the BATT4EU Partnership?

Launched officially on June 23rd 2021

A co-programmed Partnership under Horizon Europe which gathers – on the public side – **the European Commission**, and - on the private-side – **the Batteries European Partnerships Association (BEPA)** bringing together all the European battery stakeholders interested to get involved in Horizon Europe.





Calls are open to <u>all</u> (to BEPA members and to non-members)



Reminder: scope of the BATT4EU Partnership



2021 Batt4EU calls

(Not including joint call with 2Zero)



7 calls: €160 million total budget



61 proposals submitted. Funding requested: € 430 million



22 proposals under consideration, expected granted amount: € 155 million



Grant agreements expected to be signed in June 2022



2022 Batt4EU calls

Overview



10 calls opening



€133 million total budget



Calls are closing 6 September 2022 (17:00:00 Brussels time)





Introduction of the Horizon Europe battery calls for 2022





Simon Perraud, CEA-LITEN Franz Geyer, BMW

HORIZON-CL5-2022-D2-01-01: Sustainable processing and refining of battery grade graphite



Expected EU contribution per project: 5 m€



Type of Action: Innovation Action



TRL: **6-7**



In few words: Decreased dependency on imported battery-grade graphite by developing European natural and synthetic graphite



- Decreased dependency on imported battery-grade graphite, decreased risk for the European 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

For synthetic graphite:

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

For natural graphite:

Advanced refining, improved yield and lower environmental impact





HORIZON-CL5-2022-D2-01-02: Interface and electron monitoring for the engineering of new and emerging battery technologies



Expected EU contribution per project: 5 m€



Type of Action: Research and Innovation Action



TRL: **3-4**



In few words: New methods and models for studying interfaces

Projects are expected to contribute to the Battery 2030+ large scale initiative





- New methods for studying electrode/electrolyte interfaces for liquid-based electrolytes and batteries and studying sold-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-D2-01-03: Furthering the development of a materials acceleration platform for sustainable batteries (combining AI, big data, autonomous synthesis robotics, high throughput testing)



Expected EU contribution per project: 20 m€



Type of Action: Research and Innovation Action





TRI : 3-4

In few words: **Development of a** materials acceleration platform for sustainable batteries.

Projects are expected to contribute to the Battery 2030+ large scale initiative





- 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-D2-01-04: Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design



Expected EU contribution per project: **7-8 m€**



Type of Action: Innovation Action



TRL:



In few words: Machine development and plant site integration to facilitate giga-scale factories

Machine development part is targeting TRL6, integration part TRL 7





- □ 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-D2-01-05: Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications



Expected EU contribution per project: 5 m€



Type of Action: Research and Innovation Action



TRL: 5



In few words: High-performance and safe-by-design battery system technologies for mobility





- 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-D2-01-06: Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells)



Expected EU contribution per project: 5 m€



Type of Action: Research and Innovation Action



TRI : 2-4



In few words: Embedding smart functionalities into single cells for monitoring and self-healing

Projects are expected to contribute to the Battery 2030+ large scale initiative





- □ 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-D2-01-07: Digitalisation of battery testing, from cell to system level, including lifetime assessment



Expected EU contribution per project: 5 m€



Type of Action: Research and Innovation Action



TRL: **5-6**



In few words: Novel methods and tool to accelerate and improve battery testing





- 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



HORIZON-CL5-2022-D2-01-08: Coordination of large-scale initiative on future battery technologies



Expected EU contribution per project: 3 m€



Type of Action: Coordination and Support Action



TRL: -



In few words: Coordination of the Battery2030+ network and its contributions to the wider battery landscape



Expected outcomes:

- 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-D2-01-09: Physics and data-based battery management for optimised battery utilisation



Expected EU contribution per project: 5 m€



Type of Action: Research and Innovation Action



TRL: 4



In few words: Innovative physics- and data-based approaches to BMS, both at software and hardware levels



- 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





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 EU contribution per project: 5 m€



Type of Action: Research and Innovation Action







In few words: Best-in-world innovations to streamline collection and reversed logistics for battery recycling





- 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 the recycling industry, by applying bestin-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.









Wouter IJzermans BEPA Executive Director

Book 1:1 meeting and find your project partners until 10 August!

Objective of the platform: provide a place where all battery stakeholders interested to participate in a Battery Horizon Europe call (for 2021) can meet to create relevant collaborations.

How to use the platform:

- **Step 1:** Create your profile
- **Step 2:** Explain what you are looking for / what you can offer
- **Step 3:** Find relevant collaborators and book meetings





How to register and create your profile

Register to the BEPA match-making platform via this link.

Deadline to use the platform and book some meetings: 1 May 2022.



Describe your expertise and explain what you are looking for

- 1. Possibility to **describe your expertise** via: type of organisation, area of activity, short description.
- 2. Select the 2021 BATT4EU calls you are interested in.
- 3. Fill in a "Project Cooperation" or a "Request" in the market place.

PROJECT COOPERATION Look for a Consortium on battery topic X I would like to find a Consortium for the call 0000. My company and I can provide expertise specific- ally on the following topics: X, Y, Z. Call Sustainable processin, refining and recycling of raw materials (HORIZON-CL5-2021-D2-01-01) Fype	Elisabetta Frisaldi BEPA Bruxelles, Belgium Edit my profile View my profile	You've successfully signed up for the BEPA Horizon Europe Battery Calls Matchmaking Event 2022! Thanks for signing up. You are going to the BEPA Horizon Europe Battery Calls Matchmaking Event 2022 You'll receive an email confirmation shortly.
Partner seeking for consortium/coordinator		
July 02, 20:		
↓ ★ [*]		Co-funded by

Find relevant collaborators and book one-to-one meetings

e Battery Calls Matchmaking Event	Hom Participants Marke	tplace Agenda Meetings 🚺 Messag
	You are signed in as an organiser. Logout	
Participants Person Organization		Relevance
17 Participants found	Mirella BERRY CCI Occitanie BLAGNAC, FRANCE	Request meeting
	Dominique SCHEIDER Industry strategy transportation EMEA at Ro	Request meeting
	CLERMONT FERRAND FRANCE	





Find relevant collaborators and book one-to-one meetings

Batteries European

Partnership

NWS

Contact us if you need help!

Need help to use the platform?

Contact the BEPA Office: w.ijzermans@bepassociation.eu







Pitching session 1





Pitch 1

Jamie Smith, Senior Research Scientist LiNa Energy

HORIZON-CL5-2022-D2-01-02: Interface and electron monitoring for the engineering of new and emerging battery technologies

LiNa Energy







is commercializing high performance solid-state sodium batteries which are more sustainable, safer and lower cost than lithium-ion





Grant Projects – progress to date

Collaboration to date

Grants

- Strong track record with UK grant authorities
- Awarded £2.5m in grant income from Faraday, BEIS, APC and DfT - £1.5m to be delivered in 2022

European Union

- European Union identified as key early market for LiNa Energy
- 7 Taking advice on subsidiary within the EU

Collaboration ask

WORIZON-CL5-2022-D2-01-02 – Project Partner

- Interface and electron monitoring for the engineering of new and emerging battery technologies
- Proof-of-concept Multiphysics model with laboratory validation
- Can provide cells as a project partner for modelling activities:
 - Modelling electrode/electrolyte interfaces
 - 3D electrode behaviour at nanoscale
 - Key knowledge sharing

Theory on NaMCI within the literature but not experimented on in detail!

Pitch 2

Mariusz Walkowiak, *Director* Łukasiewicz Research Network - Institute of Non-Ferrous Metals Poznań Division

HORIZON-CL5-2022-D2-01-05: Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications









<u>Call</u>

HORIZON-CL5-2022-D2-01-05: Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications

Tentative title

Technologies for intrinsically safe e-bus batteries throughout the whole value chain

About us

Łukasiewicz Research Network (Poland)

- the third largest research network in Europe

Łukasiewicz-IMN (Institute on Non-Ferrous Metals)



- one of the largest Łukasiewicz institutes with considerable track record of European projects, covering such fields as chemical technology, metallurgy, recycling, energy storage (Poznan Division





Concept

- Key result: Demonstration of nex-generation battery with a broad portfolio of advanced safety features
- Focus on urban electric buses, e-bus company as end-user
- Demonstrating increased performances (energy density, power density, lifetime) and **<u>safety</u>** of battery systems
- Adaptation of battery system design to novel cell chemistries that will reach the market in the short-to-medium term (e.g., advanced lithiumion or **solid-state cells**)
- Addressing manufacturing, refurbishment, dismantling and recycling

Exemplary specific points of interest

- Identifying the right cell chemistry
- Self-healing materials
- · Early cell failure detection
- Thermal management (active and passive cooling)
- · Monitoring battery's state of health in real time
- Safe integration of the modules
- Innovative BMS and energy management software solutions
- Fire detection and suppression
- Electric isolation failure detection



• ...



Leader: Łukasiewicz-IMN

Confirmed industry partners: Solaris Bus&Coach, Impact Clean Power Technology

Partners sought:

- Research groups having innovative solutions enhancing battery safety
- Manufacturer(s) of solid-state/quasi solid-state lithium batteries, or other Li-ion technologies with proven enhanced safety characteristics (start-ups are welcomed !)
- Battery testing lab



CONTACT INFO:

Łukasiewicz Research Network – Institute of Non-Ferrous Metals www.imn.gliwice.pl

Poznan Division (Batteries) www.claio.poznan.pl

Contact person: mariusz.walkowiak@imn.lukasiewicz.gov.pl

PLEASE FEEL FREE TO CONTACT US

Pitch 3

Marion Bechtold, Innovation Manager, KU Leuven

HORIZON-CL5-2022-D2-01-05: Next generation technologies for high-performance and safe-by-design battery

systems for transport and mobile applications.









New Materials @ Bruges Campus Interfacial and surface engineering

Prof. dr. Veerle Vandeginste, dr. Marion Bechtold Veerle.Vandeginste@kuleuven.be


Degradable, flexible zinc-ion batteries



IR

Challenge with Li-ion batteries:

- Safety
- Lightweight
- Biocompatibility
- Flexibility
- Resources

Relevant call

HORIZON-CL5-2022-D2-01-05

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

Deadline: 6 September 2022

Solution:

New radical technologies combining abundant materials, low cost, easy processing and degradability or recyclability together with high energy density and long lifetime

Degradable, flexible zinc-ion batteries



Advantages of Zinc-ion batteries

- Higher energy density than Li
- Better security by non-combustible
- Low cost

Applications: mobile machinery, e-bikes, wearable devices, smart textiles, implantable medical devices, ...

Degradable, flexible zinc-ion batteries



Project aim:

Making fully non-hazardous eco-friendly battery system with improved mechanical and electrochemical performance

- Degradable bio-based polymer materials
- Easily recyclable metal particles

Focus on

- Interaction between electrolytes and electrodes (KU Leuven, BE)
- Degradability and life cycle assessment (KU Leuven, BE)
- Electrode development (CENIMAT, PT)
- Implementation (industrial partners)
- Looking for partners with expertise in
 - Modelling
 - Electrolytes
 - Machine learning

Pitch 4

Axel Schonecker, Chief Technology Officer E-Magy

HORIZON-CL5-2022-D2-01-05:Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications









E-MAGY AT A GLANCE

Supplier of nano-porous silicon for high-energy lithium-ion batteries

Team of 25+ engineers and PhD's in materials science, electrochemistry and engineering

Located near Amsterdam, The Netherlands

Founded in 2019; silicon crystallization experience since 2000

State-of-the art production line and battery test facilities in-house

14 **S**

Turning low-cost, abundantly available silicon into high-performance battery anode material



Interest

HORIZON-CL5-2022-D2-01-05:

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

Role

- Partner

Contributions

- Nano-porous silicon supply
- Application: silicon dominant (>80% Si) anodes
- Material application know-how (slurry preparation)
- Laboratory scale battery manufacturing and testing capabilities:
 - 128 channels coin cells
 - 16 channels single/double layer pouch cells





GET IN TOUCH



Axel Schönecker CTO

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Pitch 5

Mathieu Saraiva, *EU Correspondent* FAMN

HORIZON-CL5-2022-D2-01-05: Next generation

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







MERSEN IN BRIEF AND BATTERY MARKET



€850M 6,500 EMPLOYEES FRENCH HEADQUARTER

WORLD'S KEY PLAYER IN POWER MANAGEMENT SOLUTIONS :

- ELECTRICAL PROTECTION COMPONENTS (FUSES, PYROSWITCH)

- PASSIVE COMPONENTS (THERMAL MANAGEMENT, BUSBARS, CAPACITORS)



Mersen

MERSEN FOR SAFE AND HIGH-PERFORMANCE BATTERIES

- → Mersen is facing increase of cells and modules power density and new safety specifications
- → Our proposal : A robust cell's interconnexion solution, more efficient and safer.

Related activities :

- Safe and **optimized interconnexion designs**, allowing increasing power distribution
- Smart connexion of cells, including **fuse function and recyclability**
- **Modular distribution components**, compatible with large modules or cell-to-pack concepts
- Integration in the distribution of a compact **module fuse** to **secure battery pack during assembly, transportation, and operating life**



Laminated busbar from Mersen



Electrical protection : 340g

Electrical protection : 40g

Contact : Thomas FOUET / thomas.fouet@mersen.com



MERSEN FOR SMART AND MONITORED BATTERIES



Credit : Coventry university

 \rightarrow Smart cells monitoring means:

- → More data for smart energy management
- → But also more signals to manage from cells to BMS

How to distribute the monitoring inside the battery efficiently ?

Our proposal : A smart interconnexion solution, integrating signals distribution from cells to BMS and sensors.

Related activities :

- **Optimized electronic designs** and adapted technologies to address cells and battery monitoring with effective cost
- Sensors integration (temperature, stress, ...) directly on distribution component.





Pitch 6

Viera Pechancova, *Project Manager* & *Researcher,* Tomas Bata University in Zlín

HORIZON-CL5-2022-D2-01-05: Next generation technologies for Highperformance and safe-by-design battery systems for transport and mobile applications 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) HORIZON-CL5-2022-D2-01-08: Coordination of large-scale initiative on future battery technologies.







Tomas Bata University in Zlín, Czech republic



The design of **energy storage devices** at the Tomas Bata University (TBU) in Zlín, Czechia is carried out within the University Institute **centres** Centre for Technology Transfer (CTT) and Centre of Polymer Systems (CPS), which obtained the **HR Award HRS4R** granted by the EC to excellent research institutions. TBU has been actively developing energy storage devices in two main directions: supercapacitors and lithium-based batteries, i.e., LIBs and lithium-sulphur **batteries**. However, we examine also other scientific questions with connection to clean energy transition going far beyond technology solutions, including life-cycle









hr

HR EXCELLENCE IN RESEARCH















Research head Prof. Petr Sáha saha@utb.cz

Research & Project Management Viera Pechancova, PhD. pechancova@utb.cz

THE











Pitch 7

Fride Vullum-Bruer, Senior Research Scientist SINTEF HORIZON-CL5-2022-D2-01-01: Sustainable

processing and refining of battery grade graphite







Battery grade graphite from biomass

Motivation for an EU Project

- Most synthetic graphite production for the EV marked currently takes place in China
- Battery cell production is experiencing exponential growth in Europe with increasing materials demand
- Europe needs to become more selfsustained with battery grade graphite and the graphite must be produced sustainably





Benefits for industry and the EU

- Production of battery grade graphite from biocarbon feedstocks will reduce the carbon footprint and increase sustainability
- Help to foster the growth of the lithium-ion battery and EV industries in Europe
- Minimize reliability on Asian materials suppliers and decreased risk in the European battery supply chain
- Utilize untapped resources of biomass materials from the forestry and paper industries



Working title: SUPeRBAGG - Sustainable Production of Synthetic Battery Grade Graphite from Bio-based Precursors

- ✓ Vianode's graphite produced with pet coke will be used as baseline
- ✓ Biomass will be explored as raw material in several production steps:
 - Binder in the shaping process
 - Precursor for carbon coating
 - Replacement for pet coke as main carbon source for the graphite particles



Main activities

What are we particularly looking for? Industry partner on large scale production of graphite from biomass



Contact information

Fride Vullum-Bruer SINTEF Energy AS <u>fride.vullum.bruer@sintef.no</u> +47 98667654

Q&A TIME









Wouter IJzermans BEPA Executive Director

Book 1:1 meeting and find your project partners until 10 August!

Objective of the platform: provide a place where all battery stakeholders interested to participate in a Battery Horizon Europe call (for 2021) can meet to create relevant collaborations.

How to use the platform:

- **Step 1:** Create your profile
- **Step 2:** Explain what you are looking for / what you can offer
- **Step 3:** Find relevant collaborators and book meetings





How to register and create your profile

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Deadline to use the platform and book some meetings: 1 May 2022.



Describe your expertise and explain what you are looking for

- 1. Possibility to **describe your expertise** via: type of organisation, area of activity, short description.
- 2. Select the 2021 BATT4EU calls you are interested in.
- 3. Fill in a "Project Cooperation" or a "Request" in the market place.

PROJECT COOPERATION Look for a Consortium on battery topic X I would like to find a Consortium for the call 0000. My company and I can provide expertise specific- ally on the following topics: X, Y, Z. Call	Elisabetta Frisaldi BEPA Bruxelles, Belgium Edit my profile	You've successfully signed up for the BEPA Horizon Europe Battery Calls Matchmaking Event 2022! Thanks for signing up. You are going to the BEPA Horizon Europe Battery Calls Matchmaking Event 2022! You'll receive an email confirmation shortly.
Sustainable processing, refining and recycling of raw materials (HORIZON-CL5-2021-D2-01-01) Type Partner seeking for consortium/coordinator	View my profile	BEPA
:02, 50 yluL		
ių,‡		Co-funded by the European Union

Find relevant collaborators and book one-to-one meetings

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articipants			Relevance	\sim
PERSON ORGANIZATION				
17 Participants found	0	Mirella BERRY	Request meeting	D
	- V o	CCI Occitanie Blagnac, france		
Search Q		View full profile \rightarrow		
MATCHMAKING		Dominique SCHEIDER Industry strategy transportation EMEA at Ro	Request meeting	





Find relevant collaborators and book one-to-one meetings

BA

Partnership

Batteries European

You are signed in as an organiser. La	ogout
1:1 Meetings	
ALL ACCEPTED PENDING CANCELED	AVAILABILITY
The meetings and sessions schedule is displayed in the Europe/Brussels time zone (the current time is 10:	:12). Change 🖋
Received requests	
Stefan Wolf, Consultant	③ 14:30 - 14:45
Capucine Vannoorenberghe, Association Manager	 Friday, July 09 Online Video Meeting
MEETING INVITATION RECEIVED	S Cancel C Reschedule Accept
Sent requests	Activate Windows
	Go to Settings to activate windows.

Contact us if you need help!

Need help to use the platform?

Contact the BEPA Office: w.ijzermans@bepassociation.eu







Pitching session 2





Pitch 8

Sonia García, *Resercher* Tekniker

HORIZON-CL5-2022-D2-01-07: Digitalisation of battery testing, from cell to system level, including lifetime assessment









- Design of vanadium redox flow batteries
 - Electrical simulations
 - Hydraulic simulations





based on experimental tests

• Join to project related to the call HORIZON-CL5-2022-D2-01-07

General idea

- The idea is to develop a tool in Matlab-Simulink to calculate the LCOS and the system efficiency of VRFB (stationary storage) in a simple way choosing:
 - Materials of the cell
 - Current density/power
 - Hours of storage

. . . .



Expected outcome

- This tool will help to:
 - Reduce the trial-and-error processes
 - Develop a competitive battery from the beginning of the design (technical and economical point of view)
 - Compare LCOS with other stationary energy storage technologies
 - Reduce investment and operational costs of battery systems
 - Shorter time-to-market

Pitch 9

Imran Ghoni, Founding Director Batteryminers

BATTERYMINERS 🕖

HORIZON-CL5-2022-D2-01-10: Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling







BATTERYMINERS 🛷

The market opportunity is significant, and the time is now

Starting with 10k mt in 2023, UK recycling demand is forecast to grow at a CAGR of 57% over the next 15+ years

Year	End of Life EV Batteries
2025	15,000 mt
2030	40,000 mt
2035	100,000 mt
2040	350,000mt


Seed Round - £300k



Batteryminers Recycling Process



*Areas of IP Development



Pitch 10

Cesar Prados, Chief Technology Officer Circunomics

CL5-2022-D2-01-10: Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling









circunomics

IoT platform for circular battery lifecycle management

HORIZON-CL5-2022-D2-01-10

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

2022

Streamlined End-of-Life processes need a holistic platform that connects the industries.



End-to-end solution for managing the lifecycle through data and predictive analytics.



Circular Twin

- Performance & Technical Data
- Material Data
- Sustainability & CO₂ Data
- Battery Passport Integration
- Based on Hybrid Modelling



Circular Analytics

- MANAGEMENT DASHBOARD
- Second Life Decision-Making & Match-Making
- State of Health Prediction
- Use Case Simulations
- Raw Material Valuation
- CO₂ Footprint Mitigation



- Second Life Trading
- Recycling Tendering
- Take-Back Management
- Logistics Tendering

Optimizing the EoL value chain via an intelligent platform.

Battery Specifications Battery Analytics Choose Module	2nd Life Applications	State of Health	Documents	State of Health
Module 1 *		72 %	Elename	86%
Creese 2nd Life Applications Home Storage Standard Cycling	Choose State of Health	80 %	Filename	00/0
Grid Balancing	70 %	65 %		
Chasse Power 150 W			Certificates	
terregree core		UN38.3	View document	
			Piename	View document
DeD.Act Western	2 3 4 5 6	7 8 9		
20% 80%	aishe i kasinan ilika ia	a ha dha da dha		
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What our solution offers regarding HORIZON-CL5-2022-D2-01-10:

Battery passports	Use Case Decision-Making	Predictive EoL Planning
Standardized battery labelling system for tracking & tracing along the value chain.	Diagnostics & analytics to find the ideal afterlife use case (second life or recycling).	Reverse logistics with foresight due to analytics & asset management dashboard.
Integrated Marketplace	State of Health & Raw Material Insights	Asset Management & Reporting
Seamlessly manage take- back, logistics, and re- marketing of used batteries.	Increasing the efficiency in sorting & dismantling processes through data availability.	Holistic asset dashboard for lifecycle management & EU compliance.

Which partners we are looking for regarding HORIZON-CL5-2022-D2-01-10:

Research

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Battery diagnostics

Energy storage

Thermal runaway

Discharge technology

Dismantling technology

Industry

- Energy storage
 - Dismantling technology
 - Logistics/transportation containers
 - Automotive/mobility

Looking forward to connect.

Cesar Prados Co-Founder & CTO, Circunomics T. +49 6131 63624 63 cesar.prados@circunomics.com



Pitch 11

Luis de Prada, *Research Programme Manager* EUCAR(European Council for Automotive R&D)







Relevant research areas for the Batt4EU Partnership 2022 calls

- Next-gen battery system technologies for electrification of road transport → improved performances (energy density, power density, lifetime) and safety → use cases in road transport (cars, vans, trucks and busses).
- Increased quality, reliability and life (QRL) of the battery systems following the <u>EUCAR</u> <u>future battery requirements document</u>.
- Battery and battery management system development
 - Analysis of customer expectations and real world user behaviour for battery development
 - Increasing the energy storage density of BEV
 - Improvement of battery safety: access, handling and transport of batteries



Relevant research areas for the Batt4EU Partnership 2022 calls

- Developing advance models for more reliable digital testing of batteries
 assess
 performance, lifetime and safety for road transport and decrease development
 times and costs
- Support second life of road vehicle batteries and/or increasing rates for recycling and recovery.
- Develop efficient recovering and recycling processes to ensure quality materials, cells and systems.
- Development of safe and efficient dismantling processes along EoL management chain and innovations to increase circularity in the battery supply chain.



Batt4EU Partnership 2022 calls relevant for EUCAR members

Call topic	Actio n	Size	Budget	TRL	Deadlin e
HORIZON-CL5-2022-D2-01-05: Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications	RIA	5 M€	15 M€	5	06 Sep 2022
HORIZON-CL5-2022-D2-01-06: Embedding smart functionalities into battery cells	RIA	5 M€	15 M€	2-4	06 Sep 2022
HORIZON-CL5-2022-D2-01-07: Digitalisation of battery testing, from cell to system level, including lifetime assessment	RIA	5 M€	15 M€	5-6	06 Sep 2022
HORIZON-CL5-2022-D2-01-09: Physics and data-based battery management for optimised battery utilisation	RIA	5 M€	15 M€	4	06 Sep 2022
HORIZON-CL5-2022-D2-01-10: Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling	RIA	3 M€	15 M€	5-7	06 Sep 2022



Pitch 12

Bernhard Stanje, *Research Programme Management* EARPA(European Automotive Research Partners Association)

Horizon-CL5-2022-D2-01-09: Physics and databased battery management for optimised battery utilisation







Overview Concept – Consortium Members





Pitch 13

Dimitrios Zarvalis, *Research Engineer* EARPA(European Automotive Research Partners Association)

Horizon-CL5-2022-D2-01-06: Embedding smart functionalities into battery cells (embedding sensing and selfhealing functionalities to monitor and self-repair battery cells)







Embedding smart functionalities into battery cells

The **target** of this topic is to embed sensors and self-healing functionalities into single battery cell, with sensors being capable to detect defective operation and trigger self-repairing functionalities via the Battery Management System (BMS).

- Smart functionalities with **sensing** developed to detect irreversible reactions, **c**apable of continuous, long term operation within the cell
- **Self-healing** functionalities designed to repair damage occurred within the cell which can be triggered by external stimulus
- Target: increased **quality**, **reliability** and **life** (QRL) of the battery system @ battery **cell level**
- Disruptive battery cell and battery management system technologies
- **Different battery chemistries** can be addressed with a focus on most **critical degradation** processes.
- Proof of concept of **coupling sensors and self-healing agents via BMS** should be demonstrated.
- The approach needs to be **adaptable to battery cells mass production processes** and not hinder subsequent recycling process; demonstrate he competitive advantage over alternative approaches like replacement or recycling or second-use
- Building upon the BATTERY 2030+ roadmap; TRL 2-4 by the end of the project
- Total available budget 15MEuros (5MEuros/project)



EARPA partners contribution

- 1. **CERTH** modelling and characterization, self-healing materials development
- 2. CEA : self-healing materials and sensors, BMS
- **3.** AVL : reference measurement devices, principle developments of new sensors for degradation (*photonic*-based, *ultrasonic-based*).
- 4. FhG-LBF : sensing (*impedance* based), principles to monitor usage and degradation.
- **5. CMT**: thermal management systems, contributing to modelling of cells, and battery packs, testing.
- 6. Eindhoven UNI: BMS strategies and technologies, proof of concept.
- 7. LAT: Predictive battery degradation modeling
- 8. UniFI: Finite-Element Analysis of cell/module/system (e.g. for integration of sensor in component and shock assessment).Data processing procedures for battery state (SOH, SOF, Temperature..) assessment using sensor data.





Q&A TIME



Closing remarks





Michael Lippert, BEPA President

Closing remarks

What are the next steps to take part in BEPA activities?

- Find project partners for your Horizon Europe proposals and/or create synergies via our match making platform until 1st May (via this link).
- □ Join BEPA now to get the latest information on the development of the HE 2023-24 Work Programme (*To apply for BEPA membership, follow this link*).
- □ **Register in BEPA Technical Working Groups** to identify, prioritise and draft the next battery R&I priorities and topics. (*To register in a TWG, follow this link*).





THANK YOU!

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BEPA website https://bepassociation.eu/



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