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

Proposed Approach

Aceleron have developed a range of lithium ion battery products that can be maintained at the cell level – we want to take this to the next stage and develop higher performing safe-by-design products in the transport sector – initial thinking is to do this via developing a dynamic BMS as well as incorporating a safe shutoff functionality

We are looking for partners that are working in battery powered transport applications and possibly in the testing of the batteries and BMS developers.

Organisational Capabilities

Aceleron has the battery design and manufacturing capabilities for such batteries as well as some testing facilities. We are an SME based in the UK.

Experience

We have launched several Li battery products from design to market (and achieving UN38.3 certification) including in the e-mobility sector. Amongst others we currently we have an on-going project with Toyota to deliver batteries for tuk-tuk type scooters in Africa.

We have experience working across many grant funding areas including Horizon2020 projects and have worked very closely with UCL, NPL, Toyota, Samsung as well as many others.

Administrative Information

We are looking to be a partner, however in the right consortium we could take on the Coordinator responsibilities.

Michael Downey
Michael@aceleronenergy.com
(+44) 07800933465
UK
PIC: 911221590

HORIZON-CL5-2022-D2-01-09 Physics and data-based battery management for optimised battery utilisation

Proposed Approach

Aceleron have developed a range of lithium ion battery products that can be maintained at the cell level – We would like to develop data driven methods of battery maintenance and preventative maintenance with batteries in use by developing a connected and dynamic BMS system. This would create a data stream that is able to monitor the use of the battery and predict the likelihood of any fault as well as which cell may be faulty.

We would be looking for partners in BMS development, data science, battery testing and battery enabled applications.

Organisational Capabilities

Aceleron has the battery design and manufacturing capabilities for such batteries as well as some testing facilities. We also have a data science team with knowledge on the current data streams and how to use them.
We are an SME based in the UK.

Experience

We have launched several Li battery products from design to market (and achieving UN38.3 certification) across multiple applications from e-mobility to stationary commercial power. Amongst others we currently we have an on-going project with Toyota to deliver batteries for tuk-tuk type scooters in Africa and a project to design and build a 2nd life battery manufacturing lab within a shipping container.

We have experience working across many grant funding areas including Horizon2020 projects and have worked very closely with UCL, NPL, Toyota, Samsung as well as many others.

Administrative Information

We are looking to be a partner, however in the right consortium we could take on the Coordinator responsibilities.

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BATT4EU
Batteries European Partnership

A co-programmed partnership under Horizon Europe

2022 Horizon Europe calls on batteries
Introduction

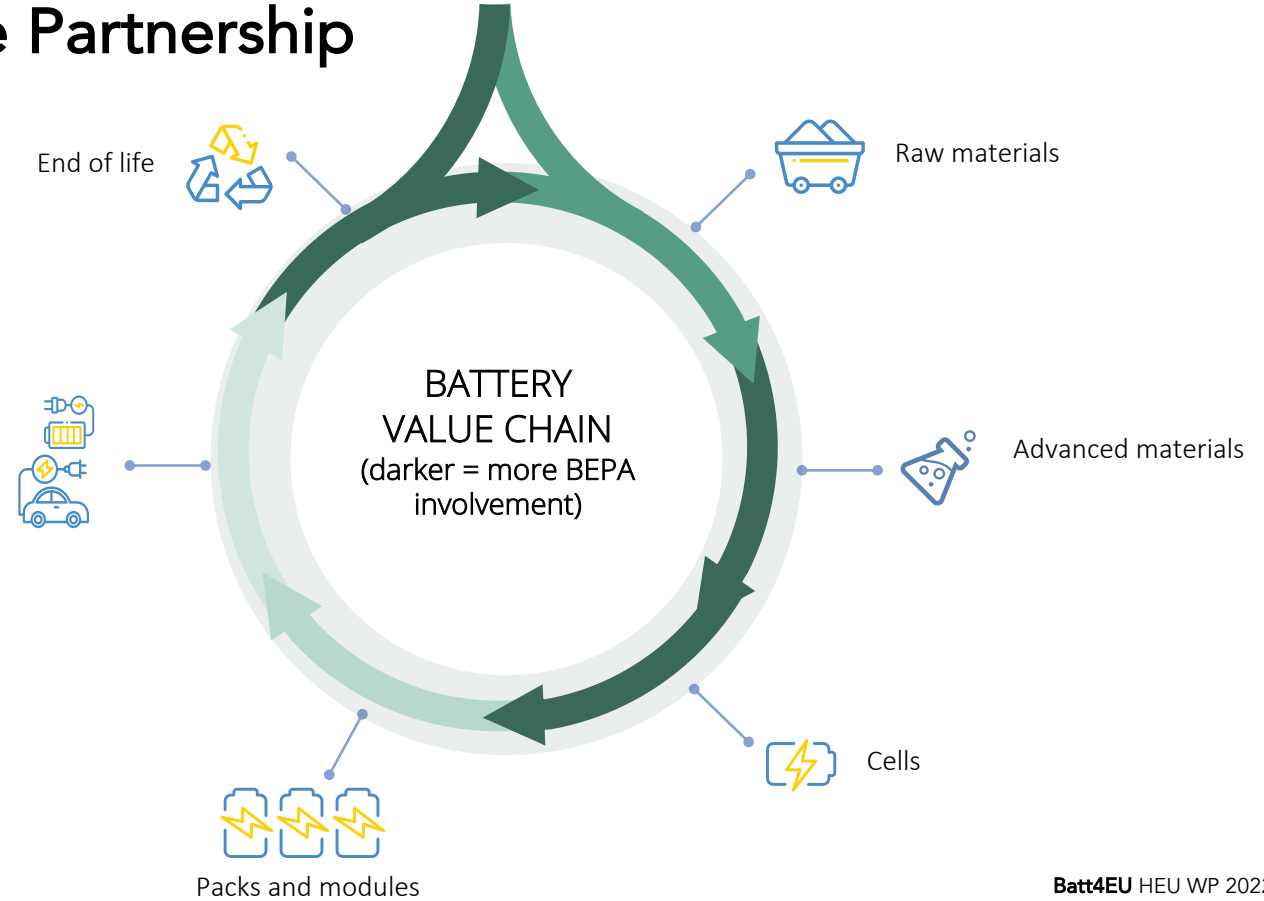
@bepa_eu

Wouter IJzermans
BEPA Executive Director

February 2022

BEPA
Batteries European Partnership Association

Focus of the Partnership



Partnerships dedicated to applications will lead the downstream R&I segments activities

2022 calls on batteries

Short overview

- 10 calls linked to the Batteries Partnership
- 133 million of total funding
- Developed by private members of BEPA, the European Commission and Member States
- Calls are open for all
- Always, always, always check the call text on the funding portal

Sustainable processing and refining of battery grade graphite

HORIZON-CL5-2022-D2-01-01 – Innovation Action - TRL 6-7 – 10M€ budget – 5M € per project

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 an synthetic graphite:
  - Improve performance characteristics, reduce the 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 form natural gas pyrolysis
  - Reduction of process discharge and emissions

Projects are expected to contribute towards European Raw Materials Alliance objectives

Sustainable processing and refining of battery grade graphite

HORIZON-CL5-2022-D2-01-01 – Innovation Action - TRL 6-7 – 10M€ budget – 5M € per project

EXPECTED OUTCOMES

- 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

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

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

HORIZON-CL5-2022-D2-01-02 – Research and Innovation Action - TRL 3-4 – 10M€ budget – 5M € per project

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 cell, 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

Projects are expected to contribute to the Battery 2030+ large scale initiative. The proposal should cover this contribution.

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

HORIZON-CL5-2022-D2-01-02 – Research and Innovation Action - TRL 3-4 – 10M€ budget – 5M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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

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

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) - TRL 3-4 – 20M€ budget – 20M € per project

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

Projects are expected to contribute to the Battery 2030+ large scale initiative. The proposal should cover this contribution.

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

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) - TRL 3-4 – 20M€ budget – 20M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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.

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

HORIZON-CL5-2022-D2-01-04 –Innovation Action - TRL 6-7– 15M€ budget – 7-8M € per project

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 equipment 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 (Link to LiPLANET Network)

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

HORIZON-CL5-2022-D2-01-04 – Innovation Action - TRL 6-7 – 15M€ budget – 7-8M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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

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

HORIZON-CL5-2022-D2-01-05 –Research and Innovation Action - TRL 5– 15M€ budget – 5M € per project

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

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

HORIZON-CL5-2022-D2-01-05 –Research and Innovation Action - TRL 5– 15M€ budget – 5M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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

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

HORIZON-CL5-2022-D2-01-06 –Research and Innovation Action - TRL 2-4– 15M€ budget – 5M € per project

SCOPE

- Embed sensors and self-healing functionalities into single cells, to detect defects and trigger selfrepair 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…)

The proposal should also cover the contribution and collaboration to the BATTERY 2030+ large scale initiative

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

HORIZON-CL5-2022-D2-01-06 –Research and Innovation Action - TRL 2-4– 15M€ budget – 5M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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.

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

HORIZON-CL5-2022-D2-01-07 –Research and Innovation Action - TRL 5-6– 15M€ budget – 5M € per project

SCOPE

- Novel methods and tools to accelerate and improve battery testing
- Multi-scale approach, from cells to systems (excluding 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

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

HORIZON-CL5-2022-D2-01-07 –Research and Innovation Action - TRL 5-6– 15M€ budget – 5M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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

Coordination of large-scale initiative on future battery technologies

HORIZON-CL5-2022-D2-01-08–Coordination and Support Action - TRL N/A - 3M€ budget

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 and establish a 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 and driven by relevant actors in the field

Coordination of large-scale initiative on future battery technologies

HORIZON-CL5-2022-D2-01-08–Coordination and Support Action - TRL N/A - 3M€ budget

EXPECTED OUTCOMES

To contribute to all of the following

- 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

Physics and data-based battery management for optimised battery utilisation

HORIZON-CL5-2022-D2-01-09 –Research and Innovation Action - TRL 4 – 15M€ budget – 5M € per project

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

The selected projects are invited to participate to BRIDGE activities

Physics and data-based battery management for optimised battery utilisation

HORIZON-CL5-2022-D2-01-09 –Research and Innovation Action - TRL 4 – 15M€ budget – 5M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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

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

HORIZON-CL5-2022-D2-01-10 –Research and Innovation Action - TRL 5-7 – 15M€ budget – 5M € per project

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 and 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 and of standardised battery labelling system
- Research on batteries sorting and dismantling technologies
- Identify all potential risks and develop safe processes and safety procedures

The selected projects are invited to participate to BRIDGE activities

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

HORIZON-CL5-2022-D2-01-10 –Research and Innovation Action - TRL 5-7 – 15M€ budget – 5M € per project

EXPECTED OUTCOMES

To contribute to all of the following

- 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.

Why joining the Partnership?

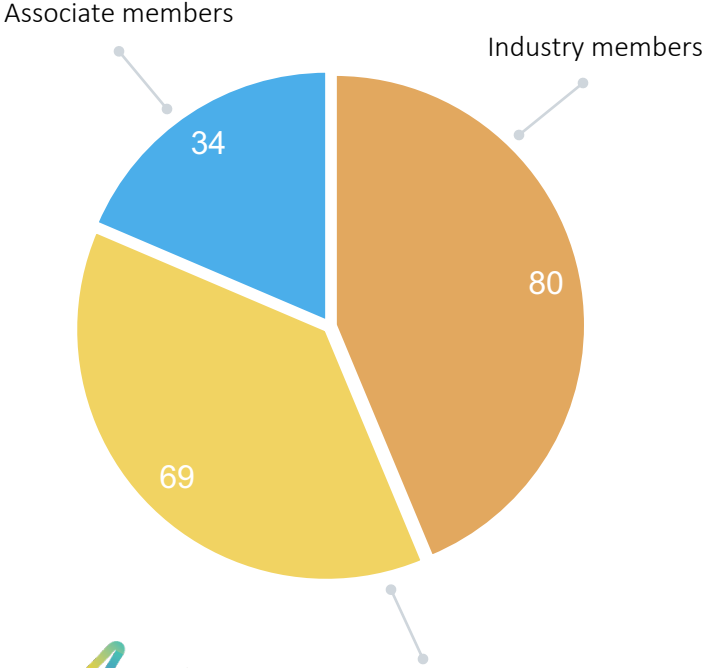
Being involved in BEPA provides the following benefits:

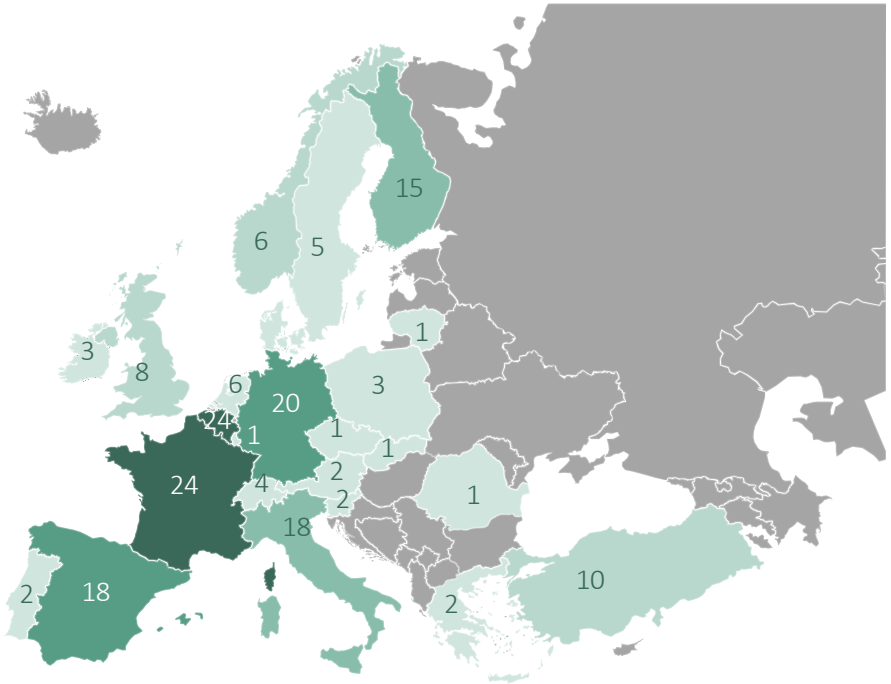
- **provide recommendations for calls for proposals** supported within the specific parts of the Horizon Europe Work Programmes related to batteries
- **get first hand information on the strategic R&I roadmap** and prioritise of research topics
- get **access to impactful research findings** generated in Europe (in Horizon Europe projects)
- be part of **a strong industrial network** with a focus on innovation
- overview and **understanding of the entire value chain** and the impacts of innovations in all sectors
- understand the impact of **innovations in cross cutting topics** (e.g. digitalization and sustainability)
- understand the different **levels of technology readiness** (what's in the pipeline!)
- **strong connections to other European Partnerships** which influence the battery industry;
- understand the requirements and conditions that will be / is created by **European regulations**.

Why joining the Partnership?

Join a wide network of stakeholders

183 members as of 7-12-2021





Next up: Matchmaking/brokerage

31 March 2022 13:30 – 17:00

- **INTRODUCTION OF THE 2022 CALLS**
- **PROPOSAL PITCHES**
- **OPENING OF DIGITAL MATCHMAKING TOOL**

- **REGISTRATION DETAILS TO FOLLOW: Follow us on Twitter (@bepa_eu) or LinkedIn**
  https://www.linkedin.com/company/bepa-batteries-european-partnership-association

BATT4EU Batteries European Partnership

Thank you

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BATT4EU
Batteries European Partnership

PITCHING SESSION

Innovate UK

ktn

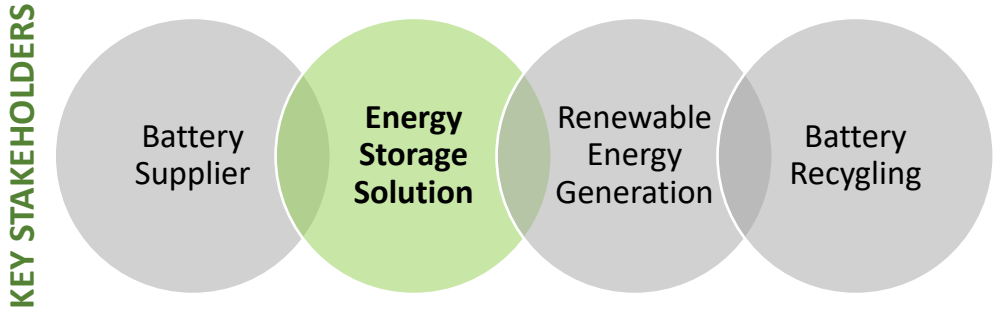
Pitch Running Order

Organisation	Country	Speaker
Alp Technology	UK	Federica Arcidiaco
Cellerate	UK	Richard Fields
Ceitec CTLab	Czech Republic	Michaela Skaroupkova
Cranfield University	UK	Daniel Auger
IMC	Czech Republic	Sabina Abbrent
Inelso	Turkey	Hacer Gediz Taski
Lucasiewicz	Poland	Marek Wasilewski
Lucasiewicz	Poland	Katarzyna Lota
MIVolt	UK	Sayan Sengupta
Novasell	Poland	Łukasz Radosiński
Sigma Lithium Ltd	UK	Gleb Ivanov
Warwick University	UK	Jennifer Wen
Waven	Poland	Łukasz Cejrowski

HORIZON-CL5-2022-D2-01-08 – Large scale battery initiatives

Proposed Approach

Create systemic change across the supply chain for the use, reuse and recycling of batteries



We are looking for battery users, clean energy generators and battery recyclers to create a network supporting the creation of a sustainable circular economy for batteries

Organisational Capabilities

We are an **SME** with a **multidisciplinary engineering team**. We also utilise an approach centered around **robust business models** and **operative efficiency**. We have been studying logistical implications of this revolution for years and are therefore well suited to coordinate the project as a whole.

Experience

Grant Experience & Success

Written more than 100 grants on a variety of topics with a number of collaborators. Have sat on review panels.

Networking with Corporate Giants, Thought Leaders & Key Universities

We have collaborated with key Universities and are speaking to large corporations to obtain investment and to involve them into our global supply chain initiative.

Experience Working with Individual Stakeholders of the Supply Chain

We have worked with battery suppliers, renewable energy providers and recycling facilities individually. Now we want to use that experience to connect the supply chain through a significant and ground-breaking collaborative effort.

Administrative Information

*We plan to **coordinate** the effort of driven stakeholders with a passion to innovate and make a disruptive impact.*

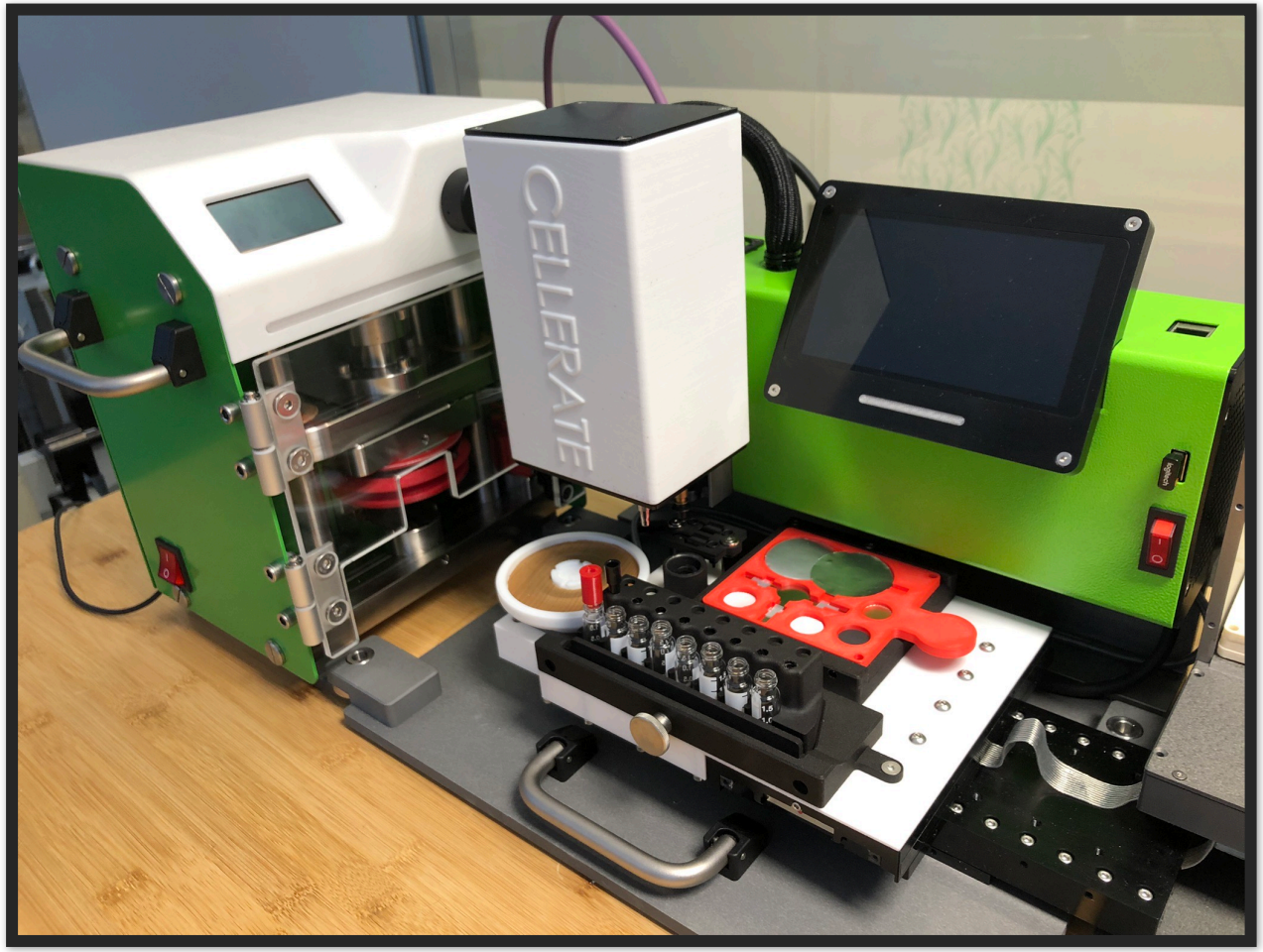
Contact:

Federica Arcidiaco
Operations Associate
hr@alp-technologies.com

London, United Kingdom

CELLERATE

- Battery R&D and QC is still based on tools developed over 30 years ago
- Cellerate is an SME developing **automated tools** to improve data quality and accelerate R&D
- Our first product is a **test cell assembler and sealer** that makes coin and pouch cells with high throughput, and images them to detect various defects
- We have a growing team of **robotics and software engineers** capable of designing advanced products
- We are looking to **partner with experts across battery R&D**, especially those facing advanced chemistry and processing problems, or who need to build significant quantities of high quality test cells.
- We also seek organisations looking to readily and precisely put sensors into battery test cells, as we believe **we can accelerate development of their technology**.



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LABMAN

KIT
Karlsruhe Institute of Technology

NDT Battery Inspection

Proposed Approach

We provide the multi-scale and multi-instrumental workflow of 3D analyses of batteries. X-ray computed tomography (CT) can nondestructively access inner features of whole battery samples in 3D giving information electrode's morphology, processes happening during charging/discharging, due to degradation, or detect defects. We can further image regions of interests in micrometre scale to analyse individual grains of material in electrodes.

We want to address Battery quality inspection.

We would like to cooperate on battery development and provide our expertise in non-destructive 3D analysis of batteries. As a research center of excellence we can participate on academic and also on industrial projects.

Organisational Capabilities

- 10 years experience in X-ray computed tomography and image processing
- Experience with scientific research and industrial cooperation
- Expert team
- 4 CT systems, from micro to nano CT

We are academic organization with the background of Brno University of Technology.

Experience

We have long experience in non-destructive analysis using CT with many papers published in high-rank scientific journals. We collaborated in various projects with both industrial and academic partners.

We cooperate with global developers of CT systems (Waygate Technologies, Thermo Fisher Scientific, Rigaku) and with academic institution around the world, i.e., Karolinska Institutet (Sweden), Institut Pasteur (France), Synchrotron Elettra (Italy), University of Leoben (Austria). We are authorized to perform a tests using CT by Czech Accreditation Institute according to CSN EN ISO/IEC 17025 standard.

Administrative Information

Academic partner

Your contact details including:

Michaela Skaroupkova
ctlab@ceitec.vutbr.cz
+420 541 142 875
Czech Republic
Your organisation's PIC

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

Proposed Approach

The 'best' approach to battery management depends on the quality of information at any given point in time. Our vision is to develop an approach to battery management that exploits the best physics and data at all points throughout a product lifecycle.

We propose to develop an approach that evolves with data and models – we will start with the 'best known' models, use on-vehicle state-of-the-art parameter modelling techniques to extract useful information in a data volume that can feasibly the stored for later processing, and we will then use regression techniques and machine learning to identify trends, differential user patterns, and fault indicators that can be periodically added to the battery management system. All this will be done in a practicable way, with realization implementations an integral aim from 'day one'.

We are looking for pack manufacturers, BMS software/electronics developers and universities with skills in electrochemical modelling to complement our skills in estimation, reduced-order modelling and artificial intelligence.

Organisational Capabilities

We have over a decade's experience of vehicle electrification. In particular, we have substantial experience in developing :

- state estimation algorithms
- models for new battery technologies
- Rapid parameter estimation
- thermal modelling
- hybrid battery control allocation strategies.

We are an academic organisation (a university) and this work fits with our mission to conduct transformative industry-oriented work.

Experience

We have an experienced and internationally published Battery Systems team led by D. Auger and A . Fotouhi. Previous experience includes major UK projects (Future Vehicles, Revolutionary Electric Vehicle Battery, LiS:FAB) and European projects (ALISE, LISA). We have a strong track record of novel work, notably the world's first state of charge and state of health estimation algorithms for Li-S batteries. Previous partners include OXIS Energy, Airbus and LEITAT Technological Center. We also have close links with major automotive OEMs.

Administrative Information

We are planning to be a partner

Your contact details including:
Dr Daniel Auger, E: d.j.auger@cranfield.ac.uk,
T: +44 1234 758062, United Kingdom

PIC 999440762

HORIZON-CL5-2022-D2-01-05

INSTITUTE OF MACROMOLECULAR CHEMISTRY
CZECH ACADEMY OF SCIENCES

Proposed Approach

We can design, produce, test and characterize in detail polymer-based materials and organic/inorganic frameworks

We want to focus on new solid or gel electrolyte materials, their optimization and detailed characterization

We would like to form a partnership with groups able to assemble and test battery cells using our electrolyte materials, coordinate the project, suggest possible improvements for our materials

Organisational Capabilities

Our institute is focused on macromolecules, their synthesis, design and detailed characterization.

IMC is part of Czech Academy of Sciences, with over 200 scientists and students dealing with all possible aspects of macromolecules. Our departments provide mutual services and analyses thus covering a wide range of scientific skill and knowledge

Experience

Several departments at IMC focus on design of new materials and their characterization. We have a broad range of instrumentation techniques suitable for electrolyte analyses above all our department of NMR spectroscopy has long-term experience with characterization of wide range of liquid, gel and solid materials.

To mention a few, we have a long-term co-operation with Uppsala (Prof. Mindemark and Brandell) and Linköping (Prof. Gao) University in Sweden or Prof. Greenbaum from CUNY, USA working on energy materials.

Administrative Information

We would like to function as a partner in a project

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Prague, Czech Republic

Horizon Europe Clean Energy Webinar
Cluster 5 / Destination 3

Proposed Approach

As Inelso, we can handle :

- smart metering,
- data monitoring and controlling,
- machine learning, deep learning and AI based system/platform development,
- IoT,
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- smart metering,
- data monitoring and controlling
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Is your organisation academic, SME, big business, etc?

Inelso is the SME company which provides business intelligence for all business line.

Experience

More than 10 R&D Project were completed. SCADA system was installed at more than 1000 point of renewable energy such as solar plant, wind turbine etc. SCADA system was installed at more than 1000 point of distribution and transmission grid.

Include your ability to attract the ‘Big Names’ in the sector (e.g. leading academics, major thought leaders)

Agile Project Management, Major Contribution as Technology Provider, Demonstration Experience, Strong R&D team at master's and doctorate level.

Administrative Information

Are you planning on being the Coordinator or a Partner?

We would like to take a role as partner.

Your contact details including:

Hacer Gediz Taskin
hacer.gediz@inelsoenergy.com
Phone: +905078436874

What country are you from

Turkey

Your organisation’s PIC: 890706187

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

- participation as one of the research centers in the development of a strong knowledge data base in the broad field of battery technology (from cradle to grave) by providing knowledge and information in the field of raw materials processing, manufacturing of advanced chemical materials, design of battery cells and modules, energy storage technologies, battery systems, fuel cells, new types of electrochemical cells, including lithium and sodium cells and supercapacitors, power source technologies, including technologies for backup and special thermal batteries, improvement of battery recycling technologies - environmentally friendly and sustainable procedures for disassembly, recycling and refining, recovery of raw materials in a closed loop

Expected results:

1. Establish a knowledge base on battery technologies;
2. Contribute to a network for the exchange of information on battery technologies.

Organisational Capabilities

- R&D centre with a focus on chemical power sources
- R&D centres with a focus on advance material technologies, functional materials, power and composite materials
- Research and manufacturing experience since 1947
- Highly specialized equipment for advanced material technologies as well battery testing under international standards

Experience

participation in numerous international (H2020, EIT Raw Materials) projects in the field of raw materials processing, manufacturing of advanced chemical materials, recycling and refining, recovery of raw materials
as well
Chemical Power Sources Testing Laboratory - Accredited by Polish Centre for Accreditation since 1997; Quality Management System in conformity with PN-EN ISO/IEC 17025

Administrative Information

- Partner

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POLAND
PIC: 998501220

HORIZON-CL5-2022-D2-01-07
Digitalisation of battery testing, from cell to system level, including lifetime assessment
HORIZON-CL5-2022-D2-01-09
Physics and data-based battery management for optimised battery utilisation.

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

1. Providing input data based on cell and battery tests:
- for developing digitalisation of battery testing
- for developing algorithms for enabling proper operation of the BMS;
2. Validation of the developed methods in the Chemical Power Sources Testing Laboratory;

Expected results:

1. Improved battery design, for longer lifetime, and better reliability and safety;
2. 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.

Organisational Capabilities

- R&D centre with a focus on chemical power sources
- Research and manufacturing experience since 1947
- Highly specialized equipment for battery testing under international standards

Experience

Chemical Power Sources Testing Laboratory - Accredited by Polish Centre for Accreditation since 1997; Quality Management System in conformity with PN-EN ISO/IEC 17025

The Laboratory provides: electrical, mechanical, environmental, thermal stresses, safety tests, disassembly analyses, thermographic camera temp. measures and post-failure expert opinions

Administrative Information

- Partner

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Katarzyna Lota
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POLAND
PIC: 998501220

HORIZON-CL5-2022-D2-01-05 – Potentially, projects in single-phase immersion cooling technology with dielectric esters for high-performance and safe-by-design battery systems for transport and mobile applications.

MIVOLT® LIQUID IMMERSION COOLING

Proposed Approach

What is your understanding of the part of the problem you can solve? Using dielectric ester fluids for battery immersion cooling to enhance performance (ultra-fast charging rates, battery longevity, power density) and safety (thermal runaway propagation) of the battery system.

What part of the Scope do you want to address? Be specific. Thermal management of battery systems for high C-rate application with dielectric ester fluids. Potentially all aspects related to the fluid can be addressed by us.

If you are looking for partners, what type of partners are you looking for? OEMs (end-users) with applications in land, marine or air, and Tier 1 battery module and pack manufacturers/technology providers who are interested to work on immersion cooling technology.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project? Supplying eco-friendly dielectric ester fluid for battery immersion cooling, along with our capabilities in - (a) selection of correct materials based on material compatibility (b) fluid performance, (c) fluid life cycle and ageing, (d) battery abuse, (e) fluid maintenance and handling

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are) We are classed as a SME.

Experience

What previous, relevant, work or track record can you bring to the team? (a) We have successfully completed Project I-CoBat as part of Faraday Battery Challenge, (b) we are presently working on another Innovate UK funded ATI project 'InCEPTion' for E-VTOL application, (c) We have been recently awarded two other APC projects for automotive and two-wheeler segments. Apart from these we shall bring in - (d) our expertise of innovating dielectric ester fluids for more than 40 years, and (e) our learnings drawing on our experience in other development for over 3 years.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders) We are engaged with and presently collaborating with reputed universities, leading academics and industry leaders in our ongoing projects.

Administrative Information

Are you planning on being the Coordinator or a Partner? We intend to be a partner on suitable projects related to battery immersion cooling.

Your contact details including:
Name, email and phone number
What country are you from
Your organisation's PIC

Sayan Sengupta
SayanSengupta@mimaterials.com
+44 7715 090 235
Company HQ in Manchester, UK

Proposed Approach

ISSUE – EVs BATTERY MAY CAUSE FIRE, many have tried to prevent this from happening, but no one has succeeded.

WHEN OTHERS FAIL,
NOVASELL THRIVES

The composite coating technology developed by us significantly reduces the negative effects of a battery fire, prevents their progression and facilitates rescue action. Our technology guarantees proper heat dissipation, heat and flame isolation, initial gas permeability and pressure release, novel self-healing properties and increased mechanical resistance.

We are looking for: technical knowledge concerning failure mode analysis of specific solutions in EV in order to prepare technology demonstrator, technical knowledge in the design of battery casing and battery packs for EV solutions, business development and distribution

Organisational Capabilities

We are SME under M+MInwestyn Ltd. A leading applicator of PFP in Poland.

- **Fire retardant, self-sealing, anti-fragmentation synthetic composite (rapid application)**
- **Know-how concerning fire engineering**
- **Expierenced team of fire safety engineers and R&D**
- **Fire and formulation lab**

Experience

- **Over 7 y. experience in design and implementation of passive fire protection systems for steel**
- **Formulation, testing of fire retardant paints**
- **R&D laboratory facilities including:**
  - **materials and formulation analysis (FTIR, LD, SEM, Viscosimetry)**
  - **High Power Computing Lab (Ansys Fluent)**
  - **corrosive, environmental chambers for formulation testing**
  - **full scale furnaces for fire tests (EN 13381:8)**

An experienced team including 6 PhDs: M. Mamzerowski (CEO, fire safety engineer), Ł.Radosiński PhD. (CTO, opto and nanotechnology), M. Borusiński PhD. (ballistic specialist), A. Porębska PhD. (formulation and toxicology expert), M. Wajsprych PhD. (chemical technology and engineering), A. Mrozowski PhD. (BD) , Paweł Sonnak Msc. (automotive engineer)

Administrative Information

Are you planning on being the Coordinator or a Partner?

Łukasz Radosiński
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+48 884 070 082
www.novasell.pl
Poland

Dendrite free metallic Li anode (3D Li)

SIGMA LITHIUM
Lithium Power For Batteries

Proposed Approach

Batteries with metallic Li anode are expected to double the energy density. However they are known to take charge very slow and may have safety issues because of dendrites formation

Oxford based Sigma Lithium Ltd has developed the technology of porous metallic Li anode with surface area of 5-10 times higher than that of standard Li anode. It is dendrite free and deliver at least 50% energy increase and 5-10 times power improvement against state-of-the-art Li-ion battery.

Looking for partners in integrating 3DLi anode in advanced Li-ion, Li-S and all-solid-state batteries

Organisational Capabilities

Sigma Lithium is running a pilot R&D facility for small batch manufacturing of proprietary 3D-Li anodes. We offer 3D metallic Li anode material for advanced valuation and integration into high power and high energy Li-ion and all-solid-state batteries.

Sigma Lithium is the Oxford start-up company, we are happy to provide both 3D-Li anode and services aimed at integration of 3D-Li into customer tailored electrochemical systems.

Experience

The technology has been successfully proven with the major multinational Li manufacture; Sigma team has over 20 years experince in Li-metal electrochemistry and in upscaling Li-S battery from coin to 10Ah pouch cells.

The technology was validate by the University of Cambridge, Department of Materials Science and Metallurgy.

Administrative Information

Planning to partner rather than being a coordinator.

Contact:
Gleb Ivanov, CEO, Sigma Lithium Ltd
gleb.ivanov@slithium.com; +44 7799 038332
Great Britain

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

Proposed Approach

What is your understanding of the part of the problem you can solve?

Supporting the development of safe battery systems through numerical modelling which will:

- help reducing number of trial and error experimental tests
- help optimizing the layout of modules and evaluating the effects of mitigation measures

What part of the Scope do you want to address?

Safety

If you are looking for partners, what type of partners are you looking for?

- Battery manufacturers
- Vehicle manufacturers
- Developers of battery thermal management systems
- Other organisations within the supply chains of the above

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- Modelling capabilities listed on the left
- Experimental facilities at WMG

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)

- Academic

Experience

What previous, relevant, work or track record can you bring to the team?

My team pioneered the development of an electrothermal model for the evolution of lithium-ion battery (LIB) from normal to abuse conditions until thermal runaway; and subsequently conducted numerical and experimental investigations on the use of phase change material to improve thermal management for LIB cell clusters. In the recently completed LibRIS project led by Jaguar Land Rover, my team developed models for thermal and mechanically induced thermal runaway as well as the resulting gases/spark ejections and fires. The models have been further used to evaluate mitigation measures and optimize LIB module design

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)

Able to attract some major players in the UK and Austria

Administrative Information

Are you planning on being the Coordinator or a Partner?

-No

Your contact details including:

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United Kingdom
University of Warwick
PIC *999976784*

WAVEN - RF Energy Rechargeable Batteries

Proposed Approach

What is your understanding of the part of the problem you can solve?
Waven consistently develops RF energy harvesting technologies to extend batteries runway and lifetime by self recharging function and deep discharge prevention thanks to the RF energy harvesting plug'n'play solution developed by Waven.

What part of the Scope do you want to address?
Self Healing and deep discharge prevention in batteries with use of the Waven's proprietary RF energy harvesting solution.

If you are looking for partners, what type of partners are you looking for?
Waven is looking for the partners with expertise in battery cell innovation and development for integration with Waven RF energy harvesting technologies.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?
Waven is build with strong cross-industry team where team members come from renewable energy industry, space enterprise, academic and research institutions and have experience in technology development, commercial product development and global industrial production implementations.

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)
Waven is an innovative SME with proprietary know-how in the area of RF energy harvesting.

Experience

What previous, relevant, work or track record can you bring to the team?
Waven brings unique and proprietary RF energy harvesting technology which allows for batteries discharging with surrounding radio frequency waves (Wi-Fi, GSM, etc). First models of Waven RF energy harvesting batteries recharge at 900 MHz and 2400 MHz primarily.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)
Waven technology can be used at the level of AA battery format and scaled with any combination of battery recharge with RF harvesting. We, at Waven, believe that RF energy harvesting will have wide range of applications where reliability and power security especially in low energy consumption applications is required.

Administrative Information

Are you planning on being the Coordinator or a Partner?
Waven is looking to become either partner for supplying the RF energy harvesting technology or as a Coordinator for projects with partners specialized in in battery cell innovation and development.

Your contact details including:
Łukasz Cejrowski
contact@wave-n.com
+31622907760
ul. W. Łokietka 5a, Toruń, Poland
Waven organisation's PIC: 890094117

PITCHING SESSION

Innovate UK

ktn

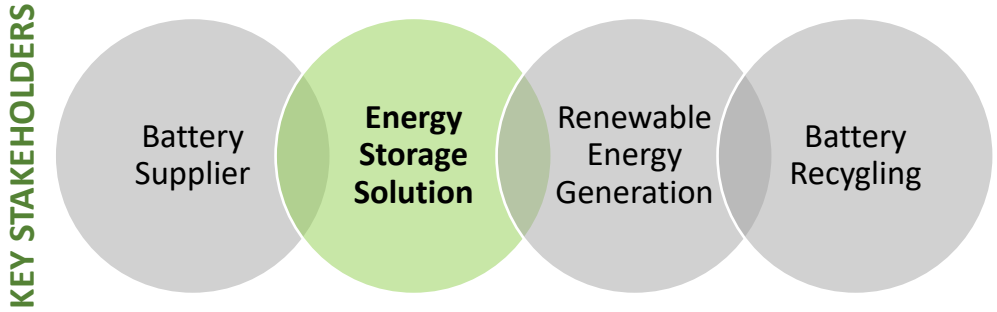
Pitch Running Order

Organisation	Country	Speaker
Alp Technology	UK	Federica Arcidiaco
Cellerate	UK	Richard Fields
Ceitec CTLab	Czech Republic	Michaela Skaroupkova
Cranfield University	UK	Daniel Auger
IMC	Czech Republic	Sabina Abbrent
Inelso	Turkey	Hacer Gediz Taski
Lucasiewicz	Poland	Marek Wasilewski
Lucasiewicz	Poland	Katarzyna Lota
MIVolt	UK	Sayan Sengupta
Novasell	Poland	Łukasz Radosiński
Sigma Lithium Ltd	UK	Gleb Ivanov
Warwick University	UK	Jennifer Wen
Waven	Poland	Łukasz Cejrowski

HORIZON-CL5-2022-D2-01-08 – Large scale battery initiatives

Proposed Approach

Create systemic change across the supply chain for the use, reuse and recycling of batteries



We are looking for battery users, clean energy generators and battery recyclers to create a network supporting the creation of a sustainable circular economy for batteries

Organisational Capabilities

We are an **SME** with a **multidisciplinary engineering team**. We also utilise an approach centered around **robust business models** and **operative efficiency**. We have been studying logistical implications of this revolution for years and are therefore well suited to coordinate the project as a whole.

Experience

Grant Experience & Success

Written more than 100 grants on a variety of topics with a number of collaborators. Have sat on review panels.

Networking with Corporate Giants, Thought Leaders & Key Universities

We have collaborated with key Universities and are speaking to large corporations to obtain investment and to involve them into our global supply chain initiative.

Experience Working with Individual Stakeholders of the Supply Chain

We have worked with battery suppliers, renewable energy providers and recycling facilities individually. Now we want to use that experience to connect the supply chain through a significant and ground-breaking collaborative effort.

Administrative Information

*We plan to **coordinate** the effort of driven stakeholders with a passion to innovate and make a disruptive impact.*

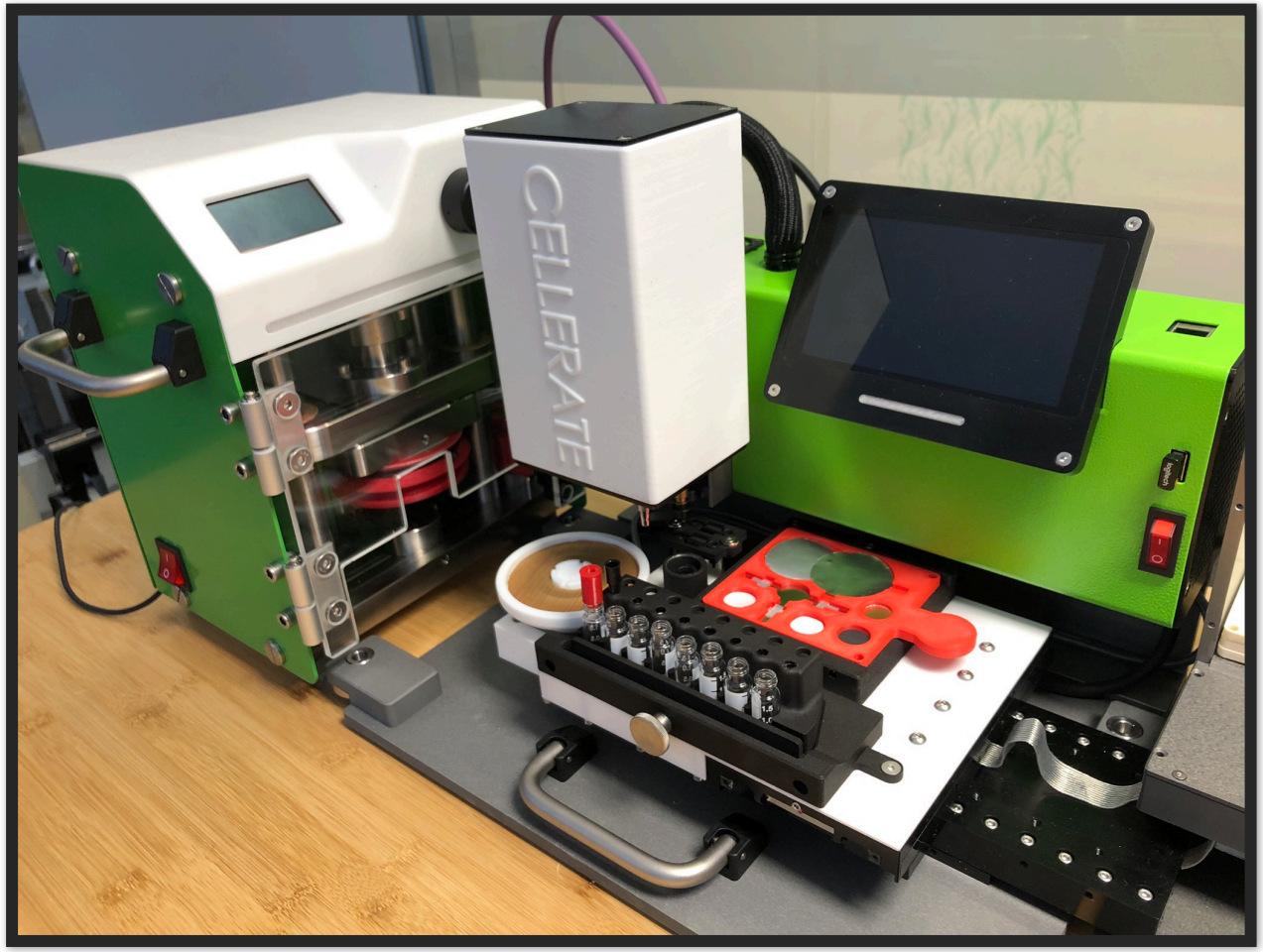
Contact:

Federica Arcidiaco
Operations Associate
hr@alp-technologies.com

London, United Kingdom

CELLERATE

- Battery R&D and QC is still based on tools developed over 30 years ago
- Cellerate is an SME developing **automated tools** to improve data quality and accelerate R&D
- Our first product is a **test cell assembler and sealer** that makes coin and pouch cells with high throughput, and images them to detect various defects
- We have a growing team of **robotics and software engineers** capable of designing advanced products
- We are looking to **partner with experts across battery R&D**, especially those facing advanced chemistry and processing problems, or who need to build significant quantities of high quality test cells.
- We also seek organisations looking to readily and precisely put sensors into battery test cells, as we believe **we can accelerate development of their technology**.



Dr Richard Fields
CEO, Cellerate Ltd.
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+44 (0) 7512 673307
United Kingdom
www.cellerate.co.uk

LABMAN

KIT
Karlsruhe Institute of Technology

NDT Battery Inspection

Proposed Approach

We provide the multi-scale and multi-instrumental workflow of 3D analyses of batteries. X-ray computed tomography (CT) can nondestructively access inner features of whole battery samples in 3D giving information electrode's morphology, processes happening during charging/discharging, due to degradation, or detect defects. We can further image regions of interests in micrometre scale to analyse individual grains of material in electrodes.

We want to address Battery quality inspection.

We would like to cooperate on battery development and provide our expertise in non-destructive 3D analysis of batteries. As a research center of excellence we can participate on academic and also on industrial projects.

Organisational Capabilities

- 10 years experience in X-ray computed tomography and image processing
- Experience with scientific research and industrial cooperation
- Expert team
- 4 CT systems, from micro to nano CT

We are academic organization with the background of Brno University of Technology.

Experience

We have long experience in non-destructive analysis using CT with many papers published in high-rank scientific journals. We collaborated in various projects with both industrial and academic partners.

We cooperate with global developers of CT systems (Waygate Technologies, Thermo Fisher Scientific, Rigaku) and with academic institution around the world, i.e., Karolinska Institutet (Sweden), Institut Pasteur (France), Synchrotron Elettra (Italy), University of Leoben (Austria). We are authorized to perform a tests using CT by Czech Accreditation Institute according to CSN EN ISO/IEC 17025 standard.

Administrative Information

Academic partner

Your contact details including:

Michaela Skaroupkova
ctlab@ceitec.vutbr.cz
+420 541 142 875
Czech Republic
Your organisation's PIC

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

Proposed Approach

The 'best' approach to battery management depends on the quality of information at any given point in time. Our vision is to develop an approach to battery management that exploits the best physics and data at all points throughout a product lifecycle.

We propose to develop an approach that evolves with data and models – we will start with the 'best known' models, use on-vehicle state-of-the-art parameter modelling techniques to extract useful information in a data volume that can feasibly the stored for later processing, and we will then use regression techniques and machine learning to identify trends, differential user patterns, and fault indicators that can be periodically added to the battery management system. All this will be done in a practicable way, with realization implementations an integral aim from 'day one'.

We are looking for pack manufacturers, BMS software/electronics developers and universities with skills in electrochemical modelling to complement our skills in estimation, reduced-order modelling and artificial intelligence.

Organisational Capabilities

We have over a decade's experience of vehicle electrification. In particular, we have substantial experience in developing :

- state estimation algorithms
- models for new battery technologies
- Rapid parameter estimation
- thermal modelling
- hybrid battery control allocation strategies.

We are an academic organisation (a university) and this work fits with our mission to conduct transformative industry-oriented work.

Experience

We have an experienced and internationally published Battery Systems team led by D. Auger and A . Fotouhi. Previous experience includes major UK projects (Future Vehicles, Revolutionary Electric Vehicle Battery, LiS:FAB) and European projects (ALISE, LISA). We have a strong track record of novel work, notably the world's first state of charge and state of health estimation algorithms for Li-S batteries. Previous partners include OXIS Energy, Airbus and LEITAT Technological Center. We also have close links with major automotive OEMs.

Administrative Information

We are planning to be a partner

Your contact details including:
Dr Daniel Auger, E: d.j.auger@cranfield.ac.uk,
T: +44 1234 758062, United Kingdom

PIC 999440762

HORIZON-CL5-2022-D2-01-05

INSTITUTE OF MACROMOLECULAR CHEMISTRY
CZECH ACADEMY OF SCIENCES

Proposed Approach

We can design, produce, test and characterize in detail polymer-based materials and organic/inorganic frameworks

We want to focus on new solid or gel electrolyte materials, their optimization and detailed characterization

We would like to form a partnership with groups able to assemble and test battery cells using our electrolyte materials, coordinate the project, suggest possible improvements for our materials

Organisational Capabilities

Our institute is focused on macromolecules, their synthesis, design and detailed characterization.

IMC is part of Czech Academy of Sciences, with over 200 scientists and students dealing with all possible aspects of macromolecules. Our departments provide mutual services and analyses thus covering a wide range of scientific skill and knowledge

Experience

Several departments at IMC focus on design of new materials and their characterization. We have a broad range of instrumentation techniques suitable for electrolyte analyses above all our department of NMR spectroscopy has long-term experience with characterization of wide range of liquid, gel and solid materials.

To mention a few, we have a long-term co-operation with Uppsala (Prof. Mindemark and Brandell) and Linköping (Prof. Gao) University in Sweden or Prof. Greenbaum from CUNY, USA working on energy materials.

Administrative Information

We would like to function as a partner in a project

Sabina Abbrent
abbrent@imc.cas.cz
+420 722 967 624
Prague, Czech Republic

Horizon Europe Clean Energy Webinar
Cluster 5 / Destination 3

Proposed Approach

As Inelso, we can handle :

- smart metering,
- data monitoring and controlling,
- machine learning, deep learning and AI based system/platform development,
- IoT,
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- smart metering,
- data monitoring and controlling
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Is your organisation academic, SME, big business, etc?

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Include your ability to attract the ‘Big Names’ in the sector (e.g. leading academics, major thought leaders)

Agile Project Management, Major Contribution as Technology Provider, Demonstration Experience, Strong R&D team at master's and doctorate level.

Administrative Information

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We would like to take a role as partner.

Your contact details including:

Hacer Gediz Taskin
hacer.gediz@inelsoenergy.com
Phone: +905078436874

What country are you from

Turkey

Your organisation’s PIC: 890706187

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

- participation as one of the research centers in the development of a strong knowledge data base in the broad field of battery technology (from cradle to grave) by providing knowledge and information in the field of raw materials processing, manufacturing of advanced chemical materials, design of battery cells and modules, energy storage technologies, battery systems, fuel cells, new types of electrochemical cells, including lithium and sodium cells and supercapacitors, power source technologies, including technologies for backup and special thermal batteries, improvement of battery recycling technologies - environmentally friendly and sustainable procedures for disassembly, recycling and refining, recovery of raw materials in a closed loop

Expected results:

1. Establish a knowledge base on battery technologies;
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Organisational Capabilities

- R&D centre with a focus on chemical power sources
- R&D centres with a focus on advance material technologies, functional materials, power and composite materials
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Administrative Information

- Partner

http://www.imn.gliwice.pl/index/en
Marek Wasilewski
marek.wasilewski@imn.lukasiewicz.gov.pl
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POLAND
PIC: 998501220

HORIZON-CL5-2022-D2-01-07
Digitalisation of battery testing, from cell to system level, including lifetime assessment
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The Laboratory provides: electrical, mechanical, environmental, thermal stresses, safety tests, disassembly analyses, thermographic camera temp. measures and post-failure expert opinions

Administrative Information

- Partner

http://www.imn.gliwice.pl/index/en
Katarzyna Lota
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POLAND
PIC: 998501220

HORIZON-CL5-2022-D2-01-05 – Potentially, projects in single-phase immersion cooling technology with dielectric esters for high-performance and safe-by-design battery systems for transport and mobile applications.

MIVOLT® LIQUID IMMERSION COOLING

Proposed Approach

What is your understanding of the part of the problem you can solve? Using dielectric ester fluids for battery immersion cooling to enhance performance (ultra-fast charging rates, battery longevity, power density) and safety (thermal runaway propagation) of the battery system.

What part of the Scope do you want to address? Be specific. Thermal management of battery systems for high C-rate application with dielectric ester fluids. Potentially all aspects related to the fluid can be addressed by us.

If you are looking for partners, what type of partners are you looking for? OEMs (end-users) with applications in land, marine or air, and Tier 1 battery module and pack manufacturers/technology providers who are interested to work on immersion cooling technology.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project? Supplying eco-friendly dielectric ester fluid for battery immersion cooling, along with our capabilities in - (a) selection of correct materials based on material compatibility (b) fluid performance, (c) fluid life cycle and ageing, (d) battery abuse, (e) fluid maintenance and handling

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are) We are classed as a SME.

Experience

What previous, relevant, work or track record can you bring to the team? (a) We have successfully completed Project I-CoBat as part of Faraday Battery Challenge, (b) we are presently working on another Innovate UK funded ATI project 'InCEPTion' for E-VTOL application, (c) We have been recently awarded two other APC projects for automotive and two-wheeler segments. Apart from these we shall bring in - (d) our expertise of innovating dielectric ester fluids for more than 40 years, and (e) our learnings drawing on our experience in other development for over 3 years.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders) We are engaged with and presently collaborating with reputed universities, leading academics and industry leaders in our ongoing projects.

Administrative Information

Are you planning on being the Coordinator or a Partner? We intend to be a partner on suitable projects related to battery immersion cooling.

Your contact details including:
Name, email and phone number
What country are you from
Your organisation's PIC

Sayan Sengupta
SayanSengupta@mimaterials.com
+44 7715 090 235
Company HQ in Manchester, UK

Proposed Approach

ISSUE – EVs BATTERY MAY CAUSE FIRE, many have tried to prevent this from happening, but no one has succeeded.

WHEN OTHERS FAIL,
NOVASELL THRIVES

The composite coating technology developed by us significantly reduces the negative effects of a battery fire, prevents their progression and facilitates rescue action. Our technology guarantees proper heat dissipation, heat and flame isolation, initial gas permeability and pressure release, novel self-healing properties and increased mechanical resistance.

We are looking for: technical knowledge concerning failure mode analysis of specific solutions in EV in order to prepare technology demonstrator, technical knowledge in the design of battery casing and battery packs for EV solutions, business development and distribution

Organisational Capabilities

We are SME under M+MInwestyn Ltd. A leading applicator of PFP in Poland.

- **Fire retardant, self-sealing, anti-fragmentation synthetic composite (rapid application)**
- **Know-how concerning fire engineering**
- **Expierenced team of fire safety engineers and R&D**
- **Fire and formulation lab**

Experience

- **Over 7 y. experience in design and implementation of passive fire protection systems for steel**
- **Formulation, testing of fire retardant paints**
- **R&D laboratory facilities including:**
  - **materials and formulation analysis (FTIR, LD, SEM, Viscosimetry)**
  - **High Power Computing Lab (Ansys Fluent)**
  - **corrosive, environmental chambers for formulation testing**
  - **full scale furnaces for fire tests (EN 13381:8)**

An experienced team including 6 PhDs: M. Mamzerowski (CEO, fire safety engineer), Ł.Radosiński PhD. (CTO, opto and nanotechnology), M. Borusiński PhD. (ballistic specialist), A. Porębska PhD. (formulation and toxicology expert), M. Wajsprych PhD. (chemical technology and engineering), A. Mrozowski PhD. (BD) , Paweł Sonnak Msc. (automotive engineer)

Administrative Information

Are you planning on being the Coordinator or a Partner?

Łukasz Radosiński
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+48 884 070 082
www.novasell.pl
Poland

Dendrite free metallic Li anode (3D Li)

SIGMA LITHIUM
Lithium Power For Batteries

Proposed Approach

Batteries with metallic Li anode are expected to double the energy density. However they are known to take charge very slow and may have safety issues because of dendrites formation

Oxford based Sigma Lithium Ltd has developed the technology of porous metallic Li anode with surface area of 5-10 times higher than that of standard Li anode. It is dendrite free and deliver at least 50% energy increase and 5-10 times power improvement against state-of-the-art Li-ion battery.

Looking for partners in integrating 3DLi anode in advanced Li-ion, Li-S and all-solid-state batteries

Organisational Capabilities

Sigma Lithium is running a pilot R&D facility for small batch manufacturing of proprietary 3D-Li anodes. We offer 3D metallic Li anode material for advanced valuation and integration into high power and high energy Li-ion and all-solid-state batteries.

Sigma Lithium is the Oxford start-up company, we are happy to provide both 3D-Li anode and services aimed at integration of 3D-Li into customer tailored electrochemical systems.

Experience

The technology has been successfully proven with the major multinational Li manufacture; Sigma team has over 20 years experince in Li-metal electrochemistry and in upscaling Li-S battery from coin to 10Ah pouch cells.

The technology was validate by the University of Cambridge, Department of Materials Science and Metallurgy.

Administrative Information

Planning to partner rather than being a coordinator.

Contact:
Gleb Ivanov, CEO, Sigma Lithium Ltd
gleb.ivanov@slithium.com; +44 7799 038332
Great Britain

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

Proposed Approach

What is your understanding of the part of the problem you can solve?

Supporting the development of safe battery systems through numerical modelling which will:

- help reducing number of trial and error experimental tests
- help optimizing the layout of modules and evaluating the effects of mitigation measures

What part of the Scope do you want to address?

Safety

If you are looking for partners, what type of partners are you looking for?

- Battery manufacturers
- Vehicle manufacturers
- Developers of battery thermal management systems
- Other organisations within the supply chains of the above

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- Modelling capabilities listed on the left
- Experimental facilities at WMG

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)

- Academic

Experience

What previous, relevant, work or track record can you bring to the team?

My team pioneered the development of an electrothermal model for the evolution of lithium-ion battery (LIB) from normal to abuse conditions until thermal runaway; and subsequently conducted numerical and experimental investigations on the use of phase change material to improve thermal management for LIB cell clusters. In the recently completed LibRIS project led by Jaguar Land Rover, my team developed models for thermal and mechanically induced thermal runaway as well as the resulting gases/spark ejections and fires. The models have been further used to evaluate mitigation measures and optimize LIB module design

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)

Able to attract some major players in the UK and Austria

Administrative Information

Are you planning on being the Coordinator or a Partner?

-No

Your contact details including:

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(+)44 77 96707950
United Kingdom
University of Warwick
PIC *999976784*

WAVEN - RF Energy Rechargeable Batteries

Proposed Approach

What is your understanding of the part of the problem you can solve?
Waven consistently develops RF energy harvesting technologies to extend batteries runway and lifetime by self recharging function and deep discharge prevention thanks to the RF energy harvesting plug'n'play solution developed by Waven.

What part of the Scope do you want to address?
Self Healing and deep discharge prevention in batteries with use of the Waven's proprietary RF energy harvesting solution.

If you are looking for partners, what type of partners are you looking for?
Waven is looking for the partners with expertise in battery cell innovation and development for integration with Waven RF energy harvesting technologies.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?
Waven is build with strong cross-industry team where team members come from renewable energy industry, space enterprise, academic and research institutions and have experience in technology development, commercial product development and global industrial production implementations.

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)
Waven is an innovative SME with proprietary know-how in the area of RF energy harvesting.

Experience

What previous, relevant, work or track record can you bring to the team?
Waven brings unique and proprietary RF energy harvesting technology which allows for batteries discharging with surrounding radio frequency waves (Wi-Fi, GSM, etc). First models of Waven RF energy harvesting batteries recharge at 900 MHz and 2400 MHz primarily.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)
Waven technology can be used at the level of AA battery format and scaled with any combination of battery recharge with RF harvesting. We, at Waven, believe that RF energy harvesting will have wide range of applications where reliability and power security especially in low energy consumption applications is required.

Administrative Information

Are you planning on being the Coordinator or a Partner?
Waven is looking to become either partner for supplying the RF energy harvesting technology or as a Coordinator for projects with partners specialized in in battery cell innovation and development.

Your contact details including:
Łukasz Cejrowski
contact@wave-n.com
+31622907760
ul. W. Łokietka 5a, Toruń, Poland
Waven organisation's PIC: 890094117

PITCHING SESSION

Innovate UK

ktn

Pitch Running Order

Organisation	Country	Speaker
Alp Technology	UK	Federica Arcidiaco
Cellerate	UK	Richard Fields
Ceitec CTLab	Czech Republic	Michaela Skaroupkova
Cranfield University	UK	Daniel Auger
Inelso	Turkey	Hacer Gediz Taski
Lucasiewicz	Poland	Marek Wasilewski
Lucasiewicz	Poland	Katarzyna Lota
MIVolt	UK	Sayan Sengupta
Novasell	Poland	Łukasz Radosiński
Sigma Lithium Ltd	UK	Gleb Ivanov
Waven	Poland	Łukasz Cejrowski

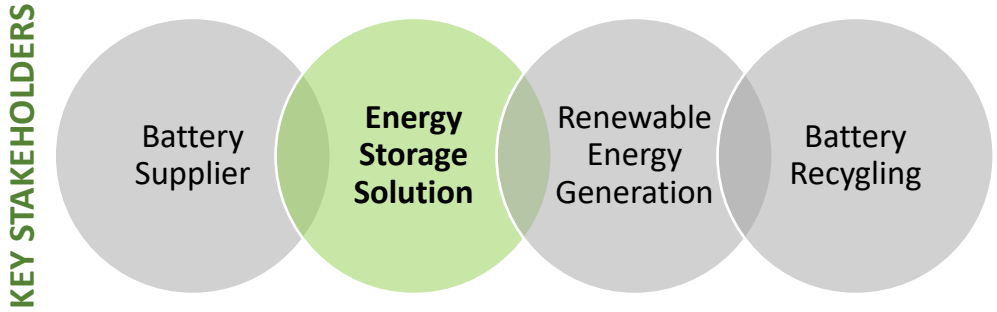
UKRI Innovate UK

ktn Global Alliance

HORIZON-CL5-2022-D2-01-08 – Large scale battery initiatives

Proposed Approach

Create systemic change across the supply chain for the use, reuse and recycling of batteries



We are looking for battery users, clean energy generators and battery recyclers to create a network supporting the creation of a sustainable circular economy for batteries

Organisational Capabilities

We are an **SME** with a **multidisciplinary engineering team**. We also utilise an approach centered around **robust business models** and **operative efficiency**. We have been studying logistical implications of this revolution for years and are therefore well suited to coordinate the project as a whole.

Experience

Grant Experience & Success

Written more than 100 grants on a variety of topics with a number of collaborators. Have sat on review panels.

Networking with Corporate Giants, Thought Leaders & Key Universities

We have collaborated with key Universities and are speaking to large corporations to obtain investment and to involve them into our global supply chain initiative.

Experience Working with Individual Stakeholders of the Supply Chain

We have worked with battery suppliers, renewable energy providers and recycling facilities individually. Now we want to use that experience to connect the supply chain through a significant and ground-breaking collaborative effort.

Administrative Information

*We plan to **coordinate** the effort of driven stakeholders with a passion to innovate and make a disruptive impact.*

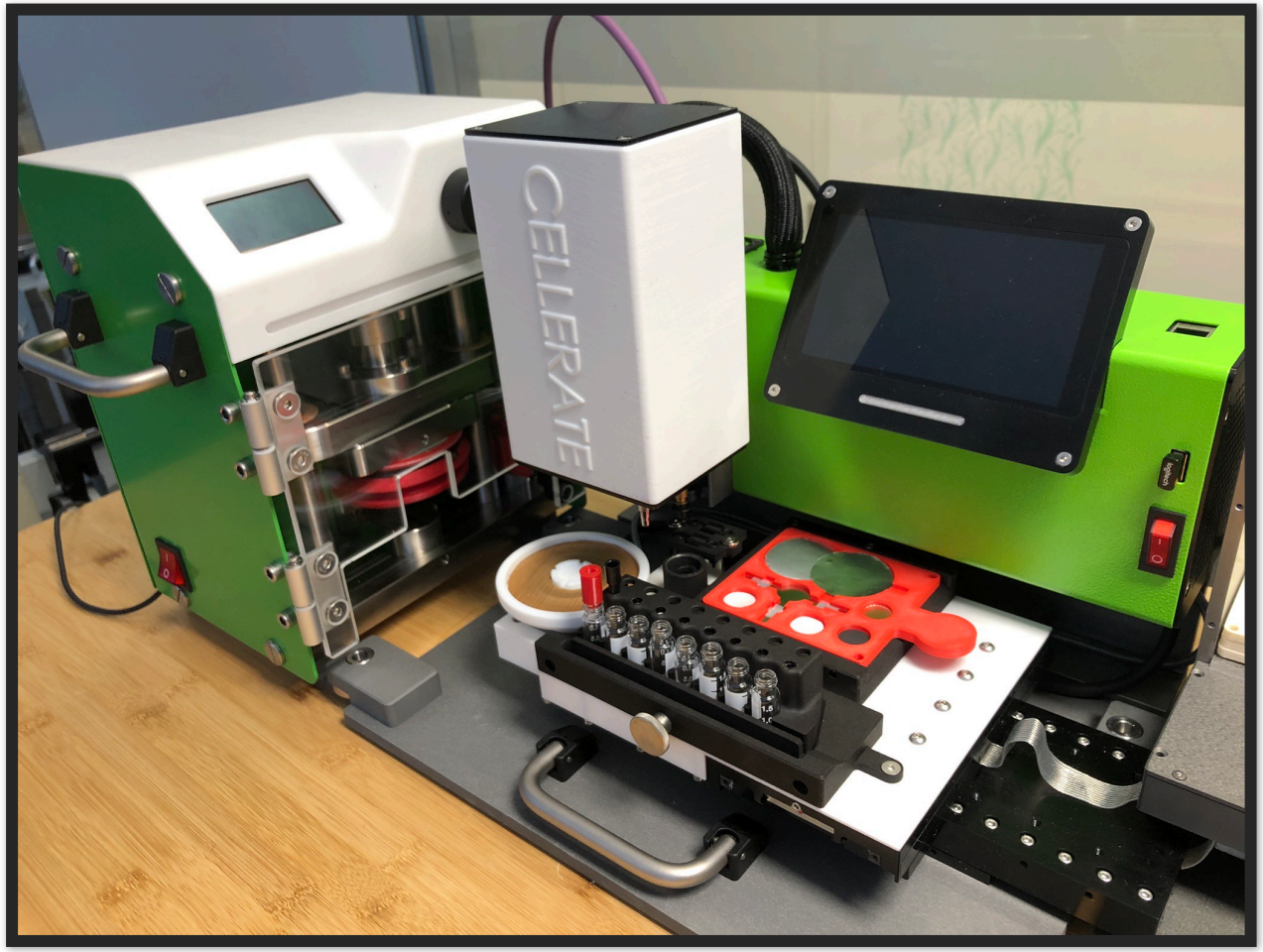
Contact:

Federica Arcidiaco
Operations Associate
hr@alp-technologies.com

London, United Kingdom

CELLERATE

- Battery R&D and QC is still based on tools developed over 30 years ago
- Cellerate is an SME developing **automated tools** to improve data quality and accelerate R&D
- Our first product is a **test cell assembler and sealer** that makes coin and pouch cells with high throughput, and images them to detect various defects
- We have a growing team of **robotics and software engineers** capable of designing advanced products
- We are looking to **partner with experts across battery R&D**, especially those facing advanced chemistry and processing problems, or who need to build significant quantities of high quality test cells.
- We also seek organisations looking to readily and precisely put sensors into battery test cells, as we believe **we can accelerate development of their technology**.



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LABMAN

KIT
Karlsruhe Institute of Technology

NDT Battery Inspection

Proposed Approach

We provide the multi-scale and multi-instrumental workflow of 3D analyses of batteries. X-ray computed tomography (CT) can nondestructively access inner features of whole battery samples in 3D giving information electrode's morphology, processes happening during charging/discharging, due to degradation, or detect defects. We can further image regions of interests in micrometre scale to analyse individual grains of material in electrodes.

We want to address Battery quality inspection.

We would like to cooperate on battery development and provide our expertise in non-destructive 3D analysis of batteries. As a research center of excellence we can participate on academic and also on industrial projects.

Organisational Capabilities

- 10 years experience in X-ray computed tomography and image processing
- Experience with scientific research and industrial cooperation
- Expert team
- 4 CT systems, from micro to nano CT

We are academic organization with the background of Brno University of Technology.

Experience

We have long experience in non-destructive analysis using CT with many papers published in high-rank scientific journals. We collaborated in various projects with both industrial and academic partners.

We cooperate with global developers of CT systems (Waygate Technologies, Thermo Fisher Scientific, Rigaku) and with academic institution around the world, i.e., Karolinska Institutet (Sweden), Institut Pasteur (France), Synchrotron Elettra (Italy), University of Leoben (Austria). We are authorized to perform a tests using CT by Czech Accreditation Institute according to CSN EN ISO/IEC 17025 standard.

Administrative Information

Academic partner

Your contact details including:

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+420 541 142 875
Czech Republic
Your organisation's PIC

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

Proposed Approach

The 'best' approach to battery management depends on the quality of information at any given point in time. Our vision is to develop an approach to battery management that exploits the best physics and data at all points throughout a product lifecycle.

We propose to develop an approach that evolves with data and models – we will start with the 'best known' models, use on-vehicle state-of-the-art parameter modelling techniques to extract useful information in a data volume that can feasibly the stored for later processing, and we will then use regression techniques and machine learning to identify trends, differential user patterns, and fault indicators that can be periodically added to the battery management system. All this will be done in a practicable way, with realization implementations an integral aim from 'day one'.

We are looking for pack manufacturers, BMS software/electronics developers and universities with skills in electrochemical modelling to complement our skills in estimation, reduced-order modelling and artificial intelligence.

Organisational Capabilities

We have over a decade's experience of vehicle electrification. In particular, we have substantial experience in developing :

- state estimation algorithms
- models for new battery technologies
- Rapid parameter estimation
- thermal modelling
- hybrid battery control allocation strategies.

We are an academic organisation (a university) and this work fits with our mission to conduct transformative industry-oriented work.

Experience

We have an experienced and internationally published Battery Systems team led by D. Auger and A . Fotouhi. Previous experience includes major UK projects (Future Vehicles, Revolutionary Electric Vehicle Battery, LiS:FAB) and European projects (ALISE, LISA). We have a strong track record of novel work, notably the world's first state of charge and state of health estimation algorithms for Li-S batteries. Previous partners include OXIS Energy, Airbus and LEITAT Technological Center. We also have close links with major automotive OEMs.

Administrative Information

We are planning to be a partner

Your contact details including:
Dr Daniel Auger, E: d.j.auger@cranfield.ac.uk,
T: +44 1234 758062, United Kingdom

PIC 999440762

Horizon Europe Clean Energy Webinar
Cluster 5 / Destination 3

Proposed Approach

As Inelso, we can handle :

- smart metering,
- data monitoring and controlling,
- machine learning, deep learning and AI based system/platform development,
- IoT,
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- smart metering,
- data monitoring and controlling
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Is your organisation academic, SME, big business, etc?

Inelso is the SME company which provides business intelligence for all business line.

Experience

More than 10 R&D Project were completed. SCADA system was installed at more than 1000 point of renewable energy such as solar plant, wind turbine etc. SCADA system was installed at more than 1000 point of distribution and transmission grid.

Include your ability to attract the ‘Big Names’ in the sector (e.g. leading academics, major thought leaders)

Agile Project Management, Major Contribution as Technology Provider, Demonstration Experience, Strong R&D team at master's and doctorate level.

Administrative Information

Are you planning on being the Coordinator or a Partner?

We would like to take a role as partner.

Your contact details including:

Hacer Gediz Taskin
hacer.gediz@inelsoenergy.com
Phone: +905078436874

What country are you from

Turkey

Your organisation’s PIC: 890706187

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

- participation as one of the research centers in the development of a strong knowledge data base in the broad field of battery technology (from cradle to grave) by providing knowledge and information in the field of raw materials processing, manufacturing of advanced chemical materials, design of battery cells and modules, energy storage technologies, battery systems, fuel cells, new types of electrochemical cells, including lithium and sodium cells and supercapacitors, power source technologies, including technologies for backup and special thermal batteries, improvement of battery recycling technologies - environmentally friendly and sustainable procedures for disassembly, recycling and refining, recovery of raw materials in a closed loop

Expected results:

1. Establish a knowledge base on battery technologies;
2. Contribute to a network for the exchange of information on battery technologies.

Organisational Capabilities

- R&D centre with a focus on chemical power sources
- R&D centres with a focus on advance material technologies, functional materials, power and composite materials
- Research and manufacturing experience since 1947
- Highly specialized equipment for advanced material technologies as well battery testing under international standards

Experience

participation in numerous international (H2020, EIT Raw Materials) projects in the field of raw materials processing, manufacturing of advanced chemical materials, recycling and refining, recovery of raw materials
as well
Chemical Power Sources Testing Laboratory - Accredited by Polish Centre for Accreditation since 1997; Quality Management System in conformity with PN-EN ISO/IEC 17025

Administrative Information

- Partner

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PIC: 998501220

HORIZON-CL5-2022-D2-01-07
Digitalisation of battery testing, from cell to system level, including lifetime assessment
HORIZON-CL5-2022-D2-01-09
Physics and data-based battery management for optimised battery utilisation.

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

1. Providing input data based on cell and battery tests:
- for developing digitalisation of battery testing
- for developing algorithms for enabling proper operation of the BMS;
2. Validation of the developed methods in the Chemical Power Sources Testing Laboratory;

Expected results:

1. Improved battery design, for longer lifetime, and better reliability and safety;
2. 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.

Organisational Capabilities

- R&D centre with a focus on chemical power sources
- Research and manufacturing experience since 1947
- Highly specialized equipment for battery testing under international standards

Experience

Chemical Power Sources Testing Laboratory - Accredited by Polish Centre for Accreditation since 1997; Quality Management System in conformity with PN-EN ISO/IEC 17025

The Laboratory provides: electrical, mechanical, environmental, thermal stresses, safety tests, disassembly analyses, thermographic camera temp. measures and post-failure expert opinions

Administrative Information

- Partner

http://www.imn.gliwice.pl/index/en
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+48 61 279 78 01
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PIC: 998501220

HORIZON-CL5-2022-D2-01-05 – Potentially, projects in single-phase immersion cooling technology with dielectric esters for high-performance and safe-by-design battery systems for transport and mobile applications.

MIVOLT® LIQUID IMMERSION COOLING

Proposed Approach

What is your understanding of the part of the problem you can solve? Using dielectric ester fluids for battery immersion cooling to enhance performance (ultra-fast charging rates, battery longevity, power density) and safety (thermal runaway propagation) of the battery system.

What part of the Scope do you want to address? Be specific. Thermal management of battery systems for high C-rate application with dielectric ester fluids. Potentially all aspects related to the fluid can be addressed by us.

If you are looking for partners, what type of partners are you looking for? OEMs (end-users) with applications in land, marine or air, and Tier 1 battery module and pack manufacturers/technology providers who are interested to work on immersion cooling technology.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project? Supplying eco-friendly dielectric ester fluid for battery immersion cooling, along with our capabilities in - (a) selection of correct materials based on material compatibility (b) fluid performance, (c) fluid life cycle and ageing, (d) battery abuse, (e) fluid maintenance and handling

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are) We are classed as a SME.

Experience

What previous, relevant, work or track record can you bring to the team? (a) We have successfully completed Project I-CoBat as part of Faraday Battery Challenge, (b) we are presently working on another Innovate UK funded ATI project 'InCEPTion' for E-VTOL application, (c) We have been recently awarded two other APC projects for automotive and two-wheeler segments. Apart from these we shall bring in - (d) our expertise of innovating dielectric ester fluids for more than 40 years, and (e) our learnings drawing on our experience in other development for over 3 years.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders) We are engaged with and presently collaborating with reputed universities, leading academics and industry leaders in our ongoing projects.

Administrative Information

Are you planning on being the Coordinator or a Partner? We intend to be a partner on suitable projects related to battery immersion cooling.

Your contact details including:
Name, email and phone number
What country are you from
Your organisation's PIC

Sayan Sengupta
SayanSengupta@mimaterials.com
+44 7715 090 235
Company HQ in Manchester, UK

Proposed Approach

ISSUE – EVs BATTERY MAY CAUSE FIRE, many have tried to prevent this from happening, but no one has succeeded.

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NOVASELL THRIVES

The composite coating technology developed by us significantly reduces the negative effects of a battery fire, prevents their progression and facilitates rescue action. Our technology guarantees proper heat dissipation, heat and flame isolation, initial gas permeability and pressure release, novel self-healing properties and increased mechanical resistance.

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Organisational Capabilities

We are SME under M+MInwestyn Ltd. A leading applicator of PFP in Poland.

- **Fire retardant, self-sealing, anti-fragmentation synthetic composite (rapid application)**
- **Know-how concerning fire engineering**
- **Expierenced team of fire safety engineers and R&D**
- **Fire and formulation lab**

Experience

- **Over 7 y. experience in design and implementation of passive fire protection systems for steel**
- **Formulation, testing of fire retardant paints**
- **R&D laboratory facilities including:**
  - **materials and formulation analysis (FTIR, LD, SEM, Viscosimetry)**
  - **High Power Computing Lab (Ansys Fluent)**
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  - **full scale furnaces for fire tests (EN 13381:8)**

An experienced team including 6 PhDs: M. Mamzerowski (CEO, fire safety engineer), Ł.Radosiński PhD. (CTO, opto and nanotechnology), M. Borusiński PhD. (ballistic specialist), A. Porębska PhD. (formulation and toxicology expert), M. Wajsprych PhD. (chemical technology and engineering), A. Mrozowski PhD. (BD) , Paweł Sonnak Msc. (automotive engineer)

Administrative Information

Are you planning on being the Coordinator or a Partner?

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+48 884 070 082
www.novasell.pl
Poland

Dendrite free metallic Li anode (3D Li)

SIGMA LITHIUM
Lithium Power For Batteries

Proposed Approach

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Sigma Lithium is the Oxford start-up company, we are happy to provide both 3D-Li anode and services aimed at integration of 3D-Li into customer tailored electrochemical systems.

Experience

The technology has been successfully proven with the major multinational Li manufacture; Sigma team has over 20 years experince in Li-metal electrochemistry and in upscaling Li-S battery from coin to 10Ah pouch cells.

The technology was validate by the University of Cambridge, Department of Materials Science and Metallurgy.

Administrative Information

Planning to partner rather than being a coordinator.

Contact:
Gleb Ivanov, CEO, Sigma Lithium Ltd
gleb.ivanov@slithium.com; +44 7799 038332
Great Britain

WAVEN - RF Energy Rechargeable Batteries

Proposed Approach

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What part of the Scope do you want to address?
Self Healing and deep discharge prevention in batteries with use of the Waven's proprietary RF energy harvesting solution.

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Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?
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Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)
Waven is an innovative SME with proprietary know-how in the area of RF energy harvesting.

Experience

What previous, relevant, work or track record can you bring to the team?
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Waven technology can be used at the level of AA battery format and scaled with any combination of battery recharge with RF harvesting. We, at Waven, believe that RF energy harvesting will have wide range of applications where reliability and power security especially in low energy consumption applications is required.

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Your contact details including:
Łukasz Cejrowski
contact@wave-n.com
+31622907760
ul. W. Łokietka 5a, Toruń, Poland
Waven organisation's PIC: 890094117

CELLERATE

- Battery R&D and QC is still based on tools developed over 30 years ago
- Cellerate is an SME developing **automated tools** to improve data quality and accelerate R&D
- Our first product is a **test cell assembler and sealer** that makes coin and pouch cells with high throughput, and images them to detect various defects
- We have a growing team of **robotics and software engineers** capable of designing advanced products
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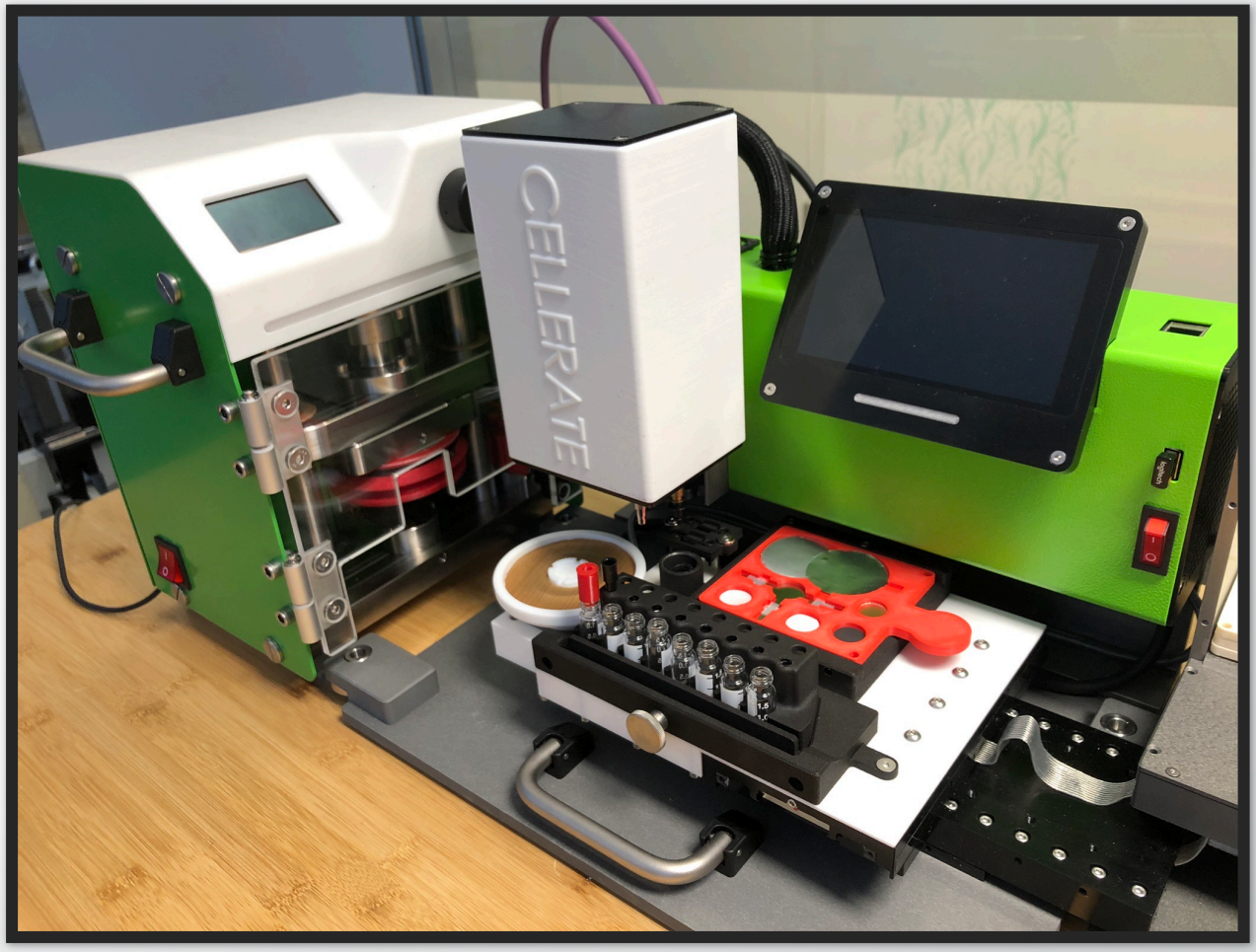

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LABMAN

KIT
Karlsruhe Institute of Technology

NDT Battery Inspection

Proposed Approach

We provide the multi-scale and multi-instrumental workflow of 3D analyses of batteries. X-ray computed tomography (CT) can nondestructively access inner features of whole battery samples in 3D giving information electrode's morphology, processes happening during charging/discharging, due to degradation, or detect defects. We can further image regions of interests in micrometre scale to analyse individual grains of material in electrodes.

We want to address Battery quality inspection.

We would like to cooperate on battery development and provide our expertise in non-destructive 3D analysis of batteries. As a research center of excellence we can participate on academic and also on industrial projects.

Organisational Capabilities

- 10 years experience in X-ray computed tomography and image processing
- Experience with scientific research and industrial cooperation
- Expert team
- 4 CT systems, from micro to nano CT

We are academic organization with the background of Brno University of Technology.

Experience

We have long experience in non-destructive analysis using CT with many papers published in high-rank scientific journals. We collaborated in various projects with both industrial and academic partners.

We cooperate with global developers of CT systems (Waygate Technologies, Thermo Fisher Scientific, Rigaku) and with academic institution around the world, i.e., Karolinska Institutet (Sweden), Institut Pasteur (France), Synchrotron Elettra (Italy), University of Leoben (Austria). We are authorized to perform a tests using CT by Czech Accreditation Institute according to CSN EN ISO/IEC 17025 standard.

Administrative Information

Academic partner

Your contact details including:

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Czech Republic
Your organisation's PIC

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised battery utilisation

Proposed Approach

The 'best' approach to battery management depends on the quality of information at any given point in time. Our vision is to develop an approach to battery management that exploits the best physics and data at all points throughout a product lifecycle.

We propose to develop an approach that evolves with data and models – we will start with the 'best known' models, use on-vehicle state-of-the-art parameter modelling techniques to extract useful information in a data volume that can feasibly the stored for later processing, and we will then use regression techniques and machine learning to identify trends, differential user patterns, and fault indicators that can be periodically added to the battery management system. All this will be done in a practicable way, with realization implementations an integral aim from 'day one'.

We are looking for pack manufacturers, BMS software/electronics developers and universities with skills in electrochemical modelling to complement our skills in estimation, reduced-order modelling and artificial intelligence.

Organisational Capabilities

We have over a decade's experience of vehicle electrification. In particular, we have substantial experience in developing :

- state estimation algorithms
- models for new battery technologies
- Rapid parameter estimation
- thermal modelling
- hybrid battery control allocation strategies.

We are an academic organisation (a university) and this work fits with our mission to conduct transformative industry-oriented work.

Experience

We have an experienced and internationally published Battery Systems team led by D. Auger and A . Fotouhi. Previous experience includes major UK projects (Future Vehicles, Revolutionary Electric Vehicle Battery, LiS:FAB) and European projects (ALISE, LISA). We have a strong track record of novel work, notably the world's first state of charge and state of health estimation algorithms for Li-S batteries. Previous partners include OXIS Energy, Airbus and LEITAT Technological Center. We also have close links with major automotive OEMs.

Administrative Information

We are planning to be a partner

Your contact details including:
Dr Daniel Auger, E: d.j.auger@cranfield.ac.uk,
T: +44 1234 758062, United Kingdom

PIC 999440762

Horizon Europe Clean Energy Webinar
Cluster 5 / Destination 3

Proposed Approach

As Inelso, we can handle :

- smart metering,
- data monitoring and controlling,
- machine learning, deep learning and AI based system/platform development,
- IoT,
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- smart metering,
- data monitoring and controlling
- multidisciplinary system integration,
- digital twin
- micro grid
- Renewable energy

Is your organisation academic, SME, big business, etc?

Inelso is the SME company which provides business intelligence for all business line.

Experience

More than 10 R&D Project were completed. SCADA system was installed at more than 1000 point of renewable energy such as solar plant, wind turbine etc. SCADA system was installed at more than 1000 point of distribution and transmission grid.

Include your ability to attract the ‘Big Names’ in the sector (e.g. leading academics, major thought leaders)

Agile Project Management, Major Contribution as Technology Provider, Demonstration Experience, Strong R&D team at master's and doctorate level.

Administrative Information

Are you planning on being the Coordinator or a Partner?

We would like to take a role as partner.

Your contact details including:

Hacer Gediz Taskin
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Phone: +905078436874

What country are you from

Turkey

Your organisation’s PIC: 890706187

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

- participation as one of the research centers in the development of a strong knowledge data base in the broad field of battery technology (from cradle to grave) by providing knowledge and information in the field of raw materials processing, manufacturing of advanced chemical materials, design of battery cells and modules, energy storage technologies, battery systems, fuel cells, new types of electrochemical cells, including lithium and sodium cells and supercapacitors, power source technologies, including technologies for backup and special thermal batteries, improvement of battery recycling technologies - environmentally friendly and sustainable procedures for disassembly, recycling and refining, recovery of raw materials in a closed loop

Expected results:

1. Establish a knowledge base on battery technologies;
2. Contribute to a network for the exchange of information on battery technologies.

Organisational Capabilities

- R&D centre with a focus on chemical power sources
- R&D centres with a focus on advance material technologies, functional materials, power and composite materials
- Research and manufacturing experience since 1947
- Highly specialized equipment for advanced material technologies as well battery testing under international standards

Experience

participation in numerous international (H2020, EIT Raw Materials) projects in the field of raw materials processing, manufacturing of advanced chemical materials, recycling and refining, recovery of raw materials
as well
Chemical Power Sources Testing Laboratory - Accredited by Polish Centre for Accreditation since 1997; Quality Management System in conformity with PN-EN ISO/IEC 17025

Administrative Information

- Partner

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HORIZON-CL5-2022-D2-01-07
Digitalisation of battery testing, from cell to system level, including lifetime assessment
HORIZON-CL5-2022-D2-01-09
Physics and data-based battery management for optimised battery utilisation.

Łukasiewicz
Institute of Non-Ferrous Metals

Proposed research activities :

1. Providing input data based on cell and battery tests:
- for developing digitalisation of battery testing
- for developing algorithms for enabling proper operation of the BMS;
2. Validation of the developed methods in the Chemical Power Sources Testing Laboratory;

Expected results:

1. Improved battery design, for longer lifetime, and better reliability and safety;
2. 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.

Organisational Capabilities

- R&D centre with a focus on chemical power sources
- Research and manufacturing experience since 1947
- Highly specialized equipment for battery testing under international standards

Experience

Chemical Power Sources Testing Laboratory - Accredited by Polish Centre for Accreditation since 1997; Quality Management System in conformity with PN-EN ISO/IEC 17025

The Laboratory provides: electrical, mechanical, environmental, thermal stresses, safety tests, disassembly analyses, thermographic camera temp. measures and post-failure expert opinions

Administrative Information

- Partner

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POLAND
PIC: 998501220

HORIZON-CL5-2022-D2-01-05 – Potentially, projects in single-phase immersion cooling technology with dielectric esters for high-performance and safe-by-design battery systems for transport and mobile applications.

MIVOLT® LIQUID IMMERSION COOLING

Proposed Approach

What is your understanding of the part of the problem you can solve? Using dielectric ester fluids for battery immersion cooling to enhance performance (ultra-fast charging rates, battery longevity, power density) and safety (thermal runaway propagation) of the battery system.

What part of the Scope do you want to address? Be specific. Thermal management of battery systems for high C-rate application with dielectric ester fluids. Potentially all aspects related to the fluid can be addressed by us.

If you are looking for partners, what type of partners are you looking for? OEMs (end-users) with applications in land, marine or air, and Tier 1 battery module and pack manufacturers/technology providers who are interested to work on immersion cooling technology.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project? Supplying eco-friendly dielectric ester fluid for battery immersion cooling, along with our capabilities in - (a) selection of correct materials based on material compatibility (b) fluid performance, (c) fluid life cycle and ageing, (d) battery abuse, (e) fluid maintenance and handling

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are) We are classed as a SME.

Experience

What previous, relevant, work or track record can you bring to the team? (a) We have successfully completed Project I-CoBat as part of Faraday Battery Challenge, (b) we are presently working on another Innovate UK funded ATI project 'InCEPTion' for E-VTOL application, (c) We have been recently awarded two other APC projects for automotive and two-wheeler segments. Apart from these we shall bring in - (d) our expertise of innovating dielectric ester fluids for more than 40 years, and (e) our learnings drawing on our experience in other development for over 3 years.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders) We are engaged with and presently collaborating with reputed universities, leading academics and industry leaders in our ongoing projects.

Administrative Information

Are you planning on being the Coordinator or a Partner? We intend to be a partner on suitable projects related to battery immersion cooling.

Your contact details including:
Name, email and phone number
What country are you from
Your organisation's PIC

Sayan Sengupta
SayanSengupta@mimaterials.com
+44 7715 090 235
Company HQ in Manchester, UK

Proposed Approach

ISSUE – EVs BATTERY MAY CAUSE FIRE, many have tried to prevent this from happening, but no one has succeeded.

WHEN OTHERS FAIL,
NOVASELL THRIVES

The composite coating technology developed by us significantly reduces the negative effects of a battery fire, prevents their progression and facilitates rescue action. Our technology guarantees proper heat dissipation, heat and flame isolation, initial gas permeability and pressure release, novel self-healing properties and increased mechanical resistance.

We are looking for: technical knowledge concerning failure mode analysis of specific solutions in EV in order to prepare technology demonstrator, technical knowledge in the design of battery casing and battery packs for EV solutions, business development and distribution

Organisational Capabilities

We are SME under M+MInwestyn Ltd. A leading applicator of PFP in Poland.

- **Fire retardant, self-sealing, anti-fragmentation synthetic composite (rapid application)**
- **Know-how concerning fire engineering**
- **Expierenced team of fire safety engineers and R&D**
- **Fire and formulation lab**

Experience

- **Over 7 y. experience in design and implementation of passive fire protection systems for steel**
- **Formulation, testing of fire retardant paints**
- **R&D laboratory facilities including:**
  - **materials and formulation analysis (FTIR, LD, SEM, Viscosimetry)**
  - **High Power Computing Lab (Ansys Fluent)**
  - **corrosive, environmental chambers for formulation testing**
  - **full scale furnaces for fire tests (EN 13381:8)**

An experienced team including 6 PhDs: M. Mamzerowski (CEO, fire safety engineer), Ł.Radosiński PhD. (CTO, opto and nanotechnology), M. Borusiński PhD. (ballistic specialist), A. Porębska PhD. (formulation and toxicology expert), M. Wajsprych PhD. (chemical technology and engineering), A. Mrozowski PhD. (BD) , Paweł Sonnak Msc. (automotive engineer)

Administrative Information

Are you planning on being the Coordinator or a Partner?

Łukasz Radosiński
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www.novasell.pl
Poland

HORIZON-CL5-2022-D2-01-05

INSTITUTE OF MACROMOLECULAR CHEMISTRY
CZECH ACADEMY OF SCIENCES

Proposed Approach

We can design, produce, test and characterize in detail polymer-based materials and organic/inorganic frameworks

We want to focus on new solid or gel electrolyte materials, their optimization and detailed characterization

We would like to form a partnership with groups able to assemble and test battery cells using our electrolyte materials, coordinate the project, suggest possible improvements for our materials

Organisational Capabilities

Our institute is focused on macromolecules, their synthesis, design and detailed characterization.

IMC is part of Czech Academy of Sciences, with over 200 scientists and students dealing with all possible aspects of macromolecules. Our departments provide mutual services and analyses thus covering a wide range of scientific skill and knowledge

Experience

Several departments at IMC focus on design of new materials and their characterization. We have a broad range of instrumentation techniques suitable for electrolyte analyses above all our department of NMR spectroscopy has long-term experience with characterization of wide range of liquid, gel and solid materials.

To mention a few, we have a long-term co-operation with Uppsala (Prof. Mindemark and Brandell) and Linköping (Prof. Gao) University in Sweden or Prof. Greenbaum from CUNY, USA working on energy materials.

Administrative Information

We would like to function as a partner in a project

Sabina Abbrent
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+420 722 967 624
Prague, Czech Republic

TOPIC NUMBER AND NAME

Your Organisation Logo / Brand

Proposed Approach

What is your understanding of the part of the problem you can solve?

What part of the Scope do you want to address? Be specific.

If you are looking for partners, what type of partners are you looking for?

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)

Experience

What previous, relevant, work or track record can you bring to the team?

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)

Administrative Information

Are you planning on being the Coordinator or a Partner?

Your contact details including:
Name, email and phone number
What country are you from
Your organisation's PIC

Dendrite free metallic Li anode (3D Li)

SIGMA LITHIUM
Lithium Power For Batteries

Proposed Approach

Batteries with metallic Li anode are expected to double the energy density. However they are known to take charge very slow and may have safety issues because of dendrites formation

Oxford based Sigma Lithium Ltd has developed the technology of porous metallic Li anode with surface area of 5-10 times higher than that of standard Li anode. It is dendrite free and deliver at least 50% energy increase and 5-10 times power improvement against state-of-the-art Li-ion battery.

Looking for partners in integrating 3DLi anode in advanced Li-ion, Li-S and all-solid-state batteries

Organisational Capabilities

Sigma Lithium is running a pilot R&D facility for small batch manufacturing of proprietary 3D-Li anodes. We offer 3D metallic Li anode material for advanced valuation and integration into high power and high energy Li-ion and all-solid-state batteries.

Sigma Lithium is the Oxford start-up company, we are happy to provide both 3D-Li anode and services aimed at integration of 3D-Li into customer tailored electrochemical systems.

Experience

The technology has been successfully proven with the major multinational Li manufacture; Sigma team has over 20 years experince in Li-metal electrochemistry and in upscaling Li-S battery from coin to 10Ah pouch cells.

The technology was validate by the University of Cambridge, Department of Materials Science and Metallurgy.

Administrative Information

Planning to partner rather than being a coordinator.

Contact:
Gleb Ivanov, CEO, Sigma Lithium Ltd
gleb.ivanov@slithium.com; +44 7799 038332
Great Britain

Dendrite free metallic Li anode (3D Li)

SIGMA LITHIUM
Lithium Power For Batteries

Proposed Approach

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The technology was validated by the University of Cambridge, Department of Materials Science and Metallurgy.

Administrative Information

Planning to partner rather than being a coordinator.

Contact:
Gleb Ivanov, CEO, Sigma Lithium Ltd
gleb.ivanov@slithium.com; +44 7799 038332
Great Britain

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

Proposed Approach

What is your understanding of the part of the problem you can solve?

Supporting the development of safe battery systems through numerical modelling which will:

- help reducing number of trial and error experimental tests
- help optimizing the layout of modules and evaluating the effects of mitigation measures

What part of the Scope do you want to address?

Safety

If you are looking for partners, what type of partners are you looking for?

- Battery manufacturers
- Vehicle manufacturers
- Developers of battery thermal management systems
- Other organisations within the supply chains of the above

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?

- Modelling capabilities listed on the left
- Experimental facilities at WMG

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)

- Academic

Experience

What previous, relevant, work or track record can you bring to the team?

My team pioneered the development of an electrothermal model for the evolution of lithium-ion battery (LIB) from normal to abuse conditions until thermal runaway; and subsequently conducted numerical and experimental investigations on the use of phase change material to improve thermal management for LIB cell clusters. In the recently completed LibRIS project led by Jaguar Land Rover, my team developed models for thermal and mechanically induced thermal runaway as well as the resulting gases/spark ejections and fires. The models have been further used to evaluate mitigation measures and optimize LIB module design

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)

Able to attract some major players in the UK and Austria

Administrative Information

Are you planning on being the Coordinator or a Partner?

-No

Your contact details including:

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United Kingdom
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PIC *999976784*

WAVEN - RF Energy Rechargeable Batteries

Proposed Approach

What is your understanding of the part of the problem you can solve?
Waven consistently develops RF energy harvesting technologies to extend batteries runway and lifetime by self recharging function and deep discharge prevention thanks to the RF energy harvesting plug'n'play solution developed by Waven.

What part of the Scope do you want to address?
Self Healing and deep discharge prevention in batteries with use of the Waven's proprietary RF energy harvesting solution.

If you are looking for partners, what type of partners are you looking for?
Waven is looking for the partners with expertise in battery cell innovation and development for integration with Waven RF energy harvesting technologies.

Organisational Capabilities

What skills, capabilities, facilities does your organisation have that will be vital for this project?
Waven is build with strong cross-industry team where team members come from renewable energy industry, space enterprise, academic and research institutions and have experience in technology development, commercial product development and global industrial production implementations.

Is your organisation academic, SME, big business, etc (and explain the benefits to this project of whichever you are)
Waven is an innovative SME with proprietary know-how in the area of RF energy harvesting.

Experience

What previous, relevant, work or track record can you bring to the team?
Waven brings unique and proprietary RF energy harvesting technology which allows for batteries discharging with surrounding radio frequency waves (Wi-Fi, GSM, etc). First models of Waven RF energy harvesting batteries recharge at 900 MHz and 2400 MHz primarily.

Include your ability to attract the 'Big Names' in the sector (e.g. leading academics, major thought leaders)
Waven technology can be used at the level of AA battery format and scaled with any combination of battery recharge with RF harvesting. We, at Waven, believe that RF energy harvesting will have wide range of applications where reliability and power security especially in low energy consumption applications is required.

Administrative Information

Are you planning on being the Coordinator or a Partner?
Waven is looking to become either partner for supplying the RF energy harvesting technology or as a Coordinator for projects with partners specialized in in battery cell innovation and development.

Your contact details including:
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Waven organisation's PIC: 890094117