



Solid-statE lithium
metal bAttery
wiTh in situ
hyBrid ELecTrolyte

NEWS

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SUMMARY

GENERAL NEWS

- ≡ The SEATBELT project

CLUSTER ACTIVITY

- ≡ The SOLID4B cluster

ACADEMIC NEWS

- ≡ Deliverables & ENGINE2023

INDUSTRIALS NEWS

- ≡ Deliverables & SOLID4B

FOCUS ON CONSORTIUM PARTNERS

- ≡ UPV-EHU / POLYMAT
- ≡ ILL (Institut Laue-Langevin)
- ≡ RENAULT

MEETINGS / COMMUNCATONS

- ≡ First onsite general assembly
- ≡ Frontiers in Polymer Science
- ≡ Ulm Electro Chemical Talks

CONTACTS

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Claire Testori, Project Engineer.



GENERAL NEWS

The SEATBELT project celebrates its 1st anniversary!

As of 2025, new generations of Li batteries based on silicon/carbon (Gen. 4a) and Li metal (Gen. 4b) anode, where flammable liquid electrolyte is replaced by a non-flammable solid-one, will take over the current Li-ion device. Therefore, **SEATBELT ambition** is to generate a **local EU industry that revolves around a cost-effective, robust all-solid-state Li battery comprising sustainable materials by 2026**.

SEATBELT intends to achieve the first technological milestone of developing a **battery cell (TRL5) meeting the needs of Electric Vehicle (EV) and stationary industry**. The low-cost SEATBELT cell will be safely-designed with sustainable and recyclable materials, reaching high energy densities (>380 Wh/kg) and long cyclability (>500 cycles) by 2026 in line with the 2030 EU targets.

The cells are produced by **low-cost** solvent-free extrusion process comprising a combination of innovative materials: thin Li metal, hybrid electrolyte, safe cathode active material without critical materials, and thin Al current collector. The **cell design** being optimized by **interface** (operando and atomistic modelling) and **process** (machine learning) methodologies. In addition, new *in situ* imaging instrumentation will be developed to investigate **safety** properties and mechanical deformation to assess cell safety in real conditions. An **innovative** recycling process from materials to battery cells will be also established.

SEATBELT will be the starting point of the first **EU all-solid-state battery value chain**, whose main players in RTD and Industry sectors are within the consortium. So, cells and modules will cycle using industrially relevant protocols dedicated to EVs and stationary applications. SEATBELT **consortium** is composed of **15 beneficiary partners with 7 affiliated entities, and 1 associated partner, from 8 European countries**.

Funded by the European union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European union or CINEA. Neither the European union nor the granting authority can be held responsible for them. This project also contributes to the objectives of the Batt4EU Partnership under call topic ID: HORIZON-CLS-2021-D2-01-03 (Advanced high-performance Generation 4a, 4b (solid-state) Li-ion batteries supporting electro mobility and other applications).



Funded by
the European Union

CLUSTER ACTIVITIES

On June 26, 2023, a first webinar of the **SOLID4B cluster** gathered experts from Horizon Europe funded projects, namely, [ADVAGEN](#), [AM4BAT](#), [HIDDEN](#), [PULSELION](#), [SEATBELT](#), [SOLID](#), [SPINMATE](#), as well as the Batteries European Partnership Association ([BEPA](#)). The topic of this webinar was centered on *Li metal anode production methods: State-of-the-art, challenges, and future perspectives*.

Our industrial partner in SEATBELT, the battery maker **Blue Solutions** proposed an overview of processing lithium metal by extrusion encompassing the industrial state-of-the-art and challenges. We are grateful to have such experts in our consortium to tackle the **next generation of Gen. 4b all-solid-state batteries**.



Circular Wallonia Days

UNLOCKING THE PATH TO A SUSTAINABLE BATTERY FUTURE

13th – 14th December 2023



as well at CRM, and 2) **The Circular Wallonia Days**. The later event is an inclusive gathering dedicated to advancing the **circularity of the battery value chain**. Join like-minded individuals, industries, and organizations passionate about sustainability as we come together to explore innovative solutions. Let's unlock the full potential of a circular battery future through industrial partnerships with companies in the **vibrant Wallonia Region** and surrounding countries. Mark your calendars for this exciting occasion, as it promises not only valuable insights and discussions but also the chance to embrace the warmth and hospitality of Belgium's Wallonia region.

We are delighted to announce that the **second onsite SEATBELT Project General Assembly meeting** will be held in Belgium on December 2023 at our partner **CRM** premise. This will offer a unique opportunity for all PGA participants to also immerse themselves in two intense experiences: 1) the **onsite and online webinar of the SOLID4B cluster** that will occur

ACADEMIC NEWS

- ≡ **4 deliverables** submitted since the start of the project from academic partners with the lead by **CNRS** (France).
- ≡ **SEATBELT** presented its activity during the **Grenoble Energy Conversion & Storage (ENGINE) Winter School in April 2023**, in Grenoble, France. This school is dedicated to **electrochemical science** related to **energy storage applications**.



INDUSTRIAL NEWS

- ≡ **2 deliverables** submitted since the start of the project by industrial partners: **LC Engineering** (Italia) and **Blue Solutions** (France).
- ≡ **SEATBELT** took part of the first **SOLID4B cluster webinar** dedicated to "Lithium metal anode production methods: state of the art, challenges, and future perspectives" in June 2023. Our industrial partner and expert in lithium metal **Blue Solutions** gave an overview of the current challenge related to the use of this metal as battery electrode material for Gen. 4b all-solid-state batteries.



FOCUS ON CONSORTIUM PARTNERS

SEATBELT consortium is composed of 15 beneficiary partners, along with 7 affiliated entities, as well as 1 associated partner, from **8 European countries**.

- ≡ Blue Solutions
- ≡ CEA
- ≡ CEMEA
- ≡ CIC Energigune
- ≡ CNRS
- ≡ CRM
- ≡ CSIC
- ≡ Euro Support
- ≡ ILL
- ≡ LC Engineering
- ≡ MEET
- ≡ Polykey
- ≡ UPV-EHU / POLYMAT
- ≡ Renault
- ≡ ZSW

UPV-EHU / POLYMAT



Universidad del País Vasco Euskal Herriko Unibertsitatea

POLYMAT

Basque Center for Macromolecular Design and Engineering

POLYMAT is a research institution linked to the University of the Basque Country (**UPV/EHU**) and internationally recognized in the field of polymer science. It is a multidisciplinary research center which includes more than 180 researchers working in different research areas such as polymer synthesis, polymer processing, rheology, polymers for electronics, energy storage, and biomedical applications. In 2017 the center received HR Excellence Award from the European Commission.

Within **SEATBELT**, UPV-EHU / POLYMAT is the leader of a Work Package devoted to the development of high-performance flexible hybrid solid electrolytes based on EU compatible materials (not critical) exhibiting stability in dry room and scale up easiness.

ILL Institut Laue-Langevin



The **Institut Laue-Langevin (ILL)** is the European source of Neutrons - an international large-scale research facility at the leading edge of Neutron science and technology, and based in Grenoble, France. Research focuses primarily on fundamental science in a variety of fields (condensed matter physics, chemistry, biology, nuclear physics, and materials science) and on close collaborations - at different levels of confidentiality - with the R&D departments of industrial enterprises.

Within **SEATBELT**, the ILL will bring its expertise in imaging (radiography, tomography) via its unique instrument combining Neutron and X-ray Tomography (the **NeXT beamline**) to assess on the safety characteristics of the innovative SEATBELT materials.

RENAULT



RENAULT Group is an international multi-brand group, selling more than 2.7 million vehicles (142,753 EVs) in 38 countries in 2021, with 40 industrial sites, 13,000 points of sales, and employing more than 156,466 people.

Within **SEATBELT**, Renault is involved in WP1 (cell target requirements), WP5 (Battery Assembly Optimization & Cycling), mainly in WP8 (Pre-Industrial Technology Development) and also through WP9 (Dissemination, Exploitation, Communication) and WP10 (Project Management).

MEETING / COMMUNICATION

First onsite **Project General Assembly**
in Spain at **UPV-EHU / POLYMAT**, June 21-22, 2023



Conference participation

Frontiers in Polymer Science, in Gothenburg Sweden, May 29 & 01 June, 2023
(Partner: **UPV-EHU / POLYMAT**)



Workshop participation

Ulm Electro Chemical Talks (UECT), Congress Centrum Ulm in Germany, June 14-15, 2023
(Partner: **ZSW**)

