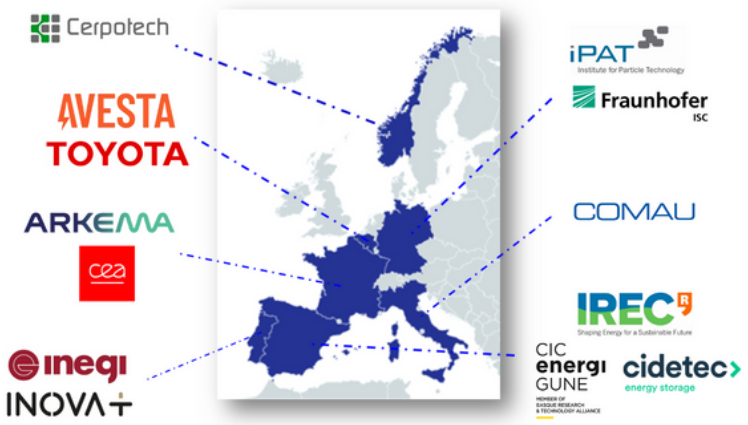
SPINMATE

Scalable and sustainable Pilot line based on INnovative MAnufacturing TEchnologies towards the industrialisation of solid-state batteries for the automotive sector

SPINMATE 5TH NEWSLETTER

JULY 2025



This newsletter will keep you informed about the project progress, research findings, and upcoming events. We will also share online initiatives to continuously promote the partners contributions, as well presenting the impact of our work on the broader scientific community.

SPINMATE CONSORTIUM

SPINMATE is a Horizon Europe project with 13 partners distributed among 7 countries, together with a mission to demonstrate a scalable, sustainable, safe, and cost-effective digital-driven proof-of-concept pilot line, at a Technology Readiness Level 6, as a first step towards the large-scale manufacturing of generation 4b (Gen 4b) SSB cells and module, to support the electrification of the automotive sector.

Missed the SOLID4B Cluster Hybrid Workshop? Watch the Full Recording Now!

If you weren't able to attend or simply want to revisit the valuable insights from the recent SOLID4B Cluster Hybrid Workshop, "Solid State Li-Metal Batteries Towards a Circular Economy Potential vs. Challenges" the full recording is now available online for you to watch at your convenience.

During the workshop, experts discussed key topics such as battery research priorities in Europe, recycling challenges for next-gen solid-state batteries, and eco-design for sustainability. Innovations like anode-free solid-state batteries using 3D printing were also covered, along with insights from industry leaders on the future of battery regulations.

🔗 Don't miss out! Watch the full recording here

LATEST UPDATES

D2.2 Pilot Line and Eco-Design Regulation Towards Disassembly Requirements

D3.3 Report On the Conclusions of the Dedicated Workshops - Revised Version

D6.1 Large Pouch Cell and Module Prototypes Design & Assembly Definitions

D8.1 Sustainability Performance (LCA) and Cost Assessment

D9.3 Communication, Dissemination and Training Activities Report – Second version

D9.5 Exploitation Activities Roadmap

D9.6 Standardisation Assessment Report - Interim

EXCITING NEWS: SPINMATE DELIVERABLES NOW PUBLICLY AVAILABLE!

We are thrilled to announce that all seven of our deliverables have been approved in June 2025.

You can explore the deliverables on our website and through the Zenodo EU Open Research Repository:

SPINMATE's Zenodo

We encourage you to dive into the detailed findings and results that have been made publicly available to drive transparency and innovation in the field.

For more information, visit our website:

https://spinmate.eu/

LATEST UPDATES

THE SOLID4B CLUSTER IS GROWING!

We are thrilled to announce new updates regarding the SOLID4B CLuster composition! With great enthusiasm, we welcome the **SPRINT**, **STELLAR**, and **ANGeLiC** projects as new partners of the Solid4B Cluster.

As the cluster continues to grow, we are excited to work alongside these new partners and strengthen our collective impact in advancing the future of energy storage solutions.

SOLID4B
Going solid for safer batteries
SPINMATE
ADVAGEN
HIDDEN
SOLiD
AM4BAT
PULSELION
SEAT BELT
PSIONIC
SOLVE

Solid4B cluster works to enhance research synergies among the European-level projects working on solid state batteries, translating research data into valuable knowledge for diverse stakeholders. This cluster was built to synchronize and conjointly promote the R&D topics in the electric vehicle field.

Since early 2024, the Solid4B Cluster has been undergoing a strategic expansion to broaden its scope and increase collaboration with key research and innovation projects. Through regular meeting sessions held three times a year, we have successfully worked to attract more Horizon Europe (HEU) and other EC/CINEA research-innovation-action projects to join us. This expansion reflects our commitment to fostering collaboration and accelerating progress in the development of next-generation battery technologies.

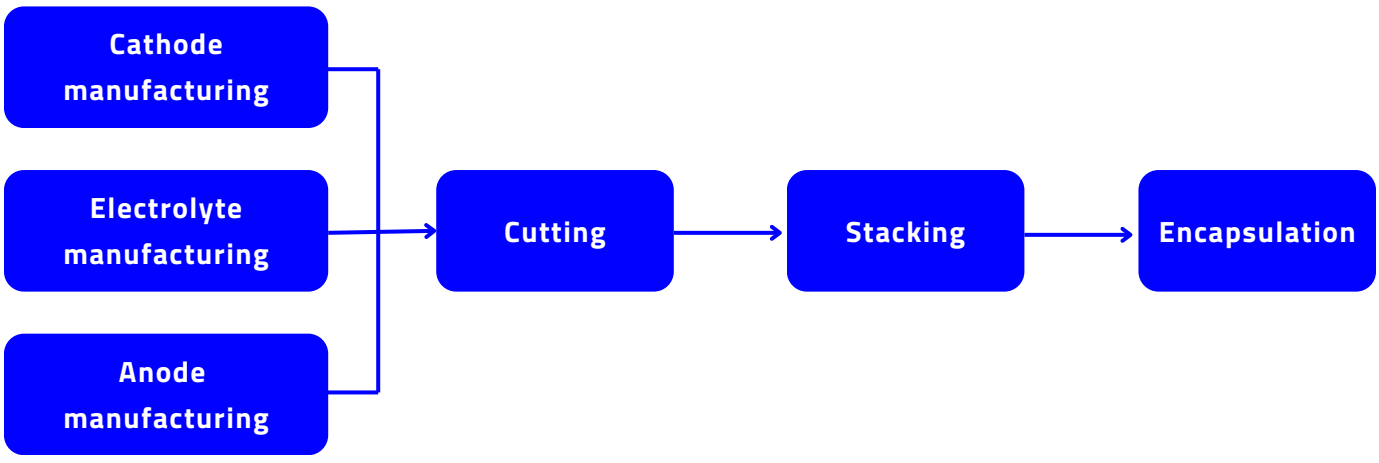
SEMESTRAL HIGHLIGHTS

Impact of Formation Cycles on Battery Performance

COMAU is conducting the comprehensive collection and post-processing of data derived from the electrical characterization of assembled and tested battery products. The primary objective is to identify robust correlations between the application of specific formation cycles and the process conditions used to manufacture each sample, ultimately linking these to the product's final performance. A significant focus will be placed on analysing the formation step, investigating its impact across various proposed versions.

Environmental and cost impact assessment through the value chain

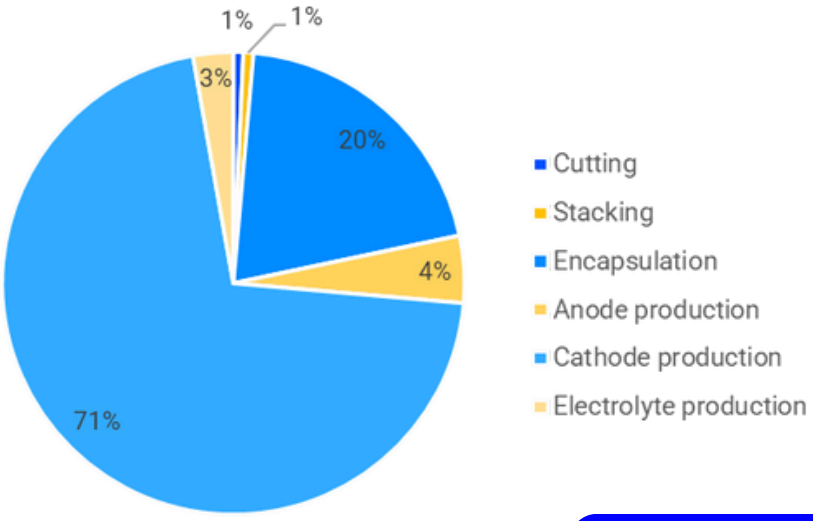
PRELIMINARY RESULTS: MANUFACTURING STEPS



SEMESTRAL HIGHLIGHTS

ENVIRONMENTAL RESULTS OF PRELIMINAR DESIGN: CO2EQ. EMISSIONS PER **MANUFACTURING STEP**

GLOBAL WARMING POTENTIAL OF MANUFACTURING 1 MONOCELL (KG CO2EQ.)



Potential environmental impacts of manufacturing 1 monolayer cell – ReCiPe 2016 Midpoint (H); Energy-mix: BE | GWP: 0.26 kg CO2eq.

Total kg CO2eq. Emissions:

0.26
kg CO2eq.

Boundaries: Cradle-to-gate

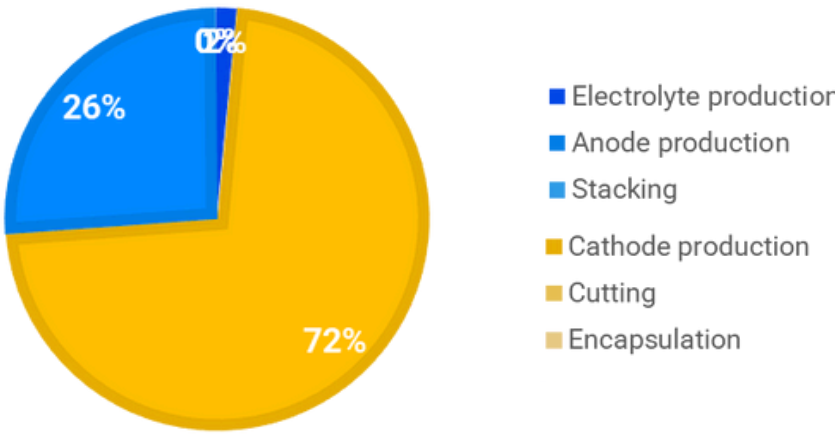
Functional unit: Manufacturing of 1 monocell

Methodology: ISO 14040/44

The impact is mainly due to the cathode production, which is attributed to the CAM (NMC811), mainly due to the materials Ni, Li, and Co.

COST RESULTS OF PRELIMINARY DESIGN: COSTS PER **MANUFACTURING STEP**

MANUFACTURING COSTS



Cost results of manufacturing 1 monolayer cell Energy-mix: BE | Cost: 1.5 €/monocell

Total cost:

1.5
€/monocell

Boundaries: Cradle-to-gate

Functional unit: Manufacturing of 1 monocell

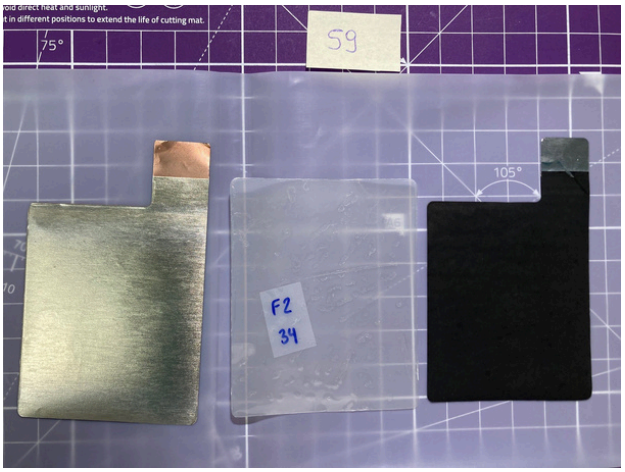
Methodology: ISO 14051

72% of the costs are associated to the cathode production, due to the CAM and ionic liquid.

26% of the costs are associated to the Anode, due to the Lithium.

SEMESTRAL HIGHLIGHTS

The shipment of several monolayer cells by CIDETEC



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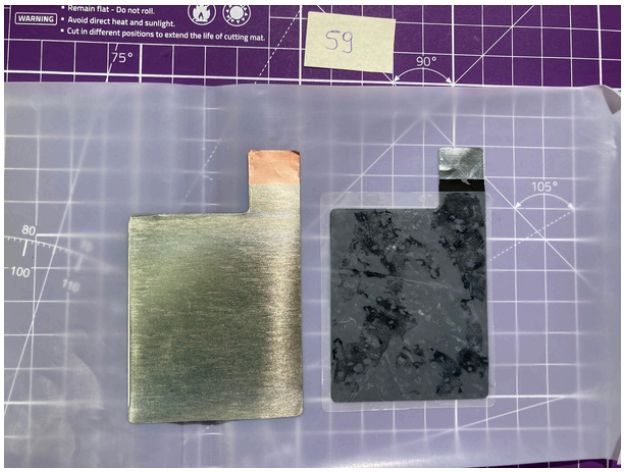

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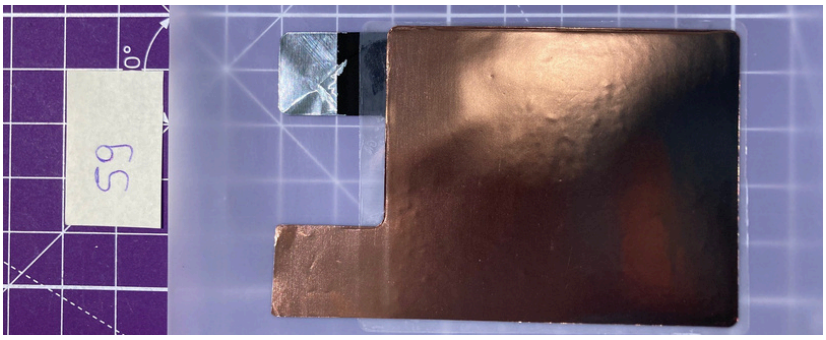

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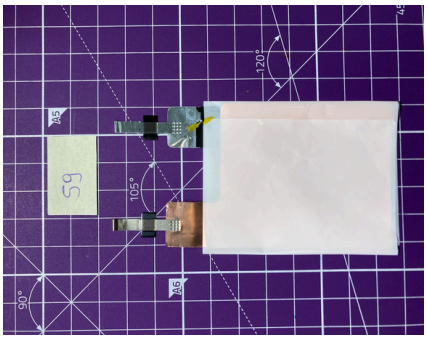
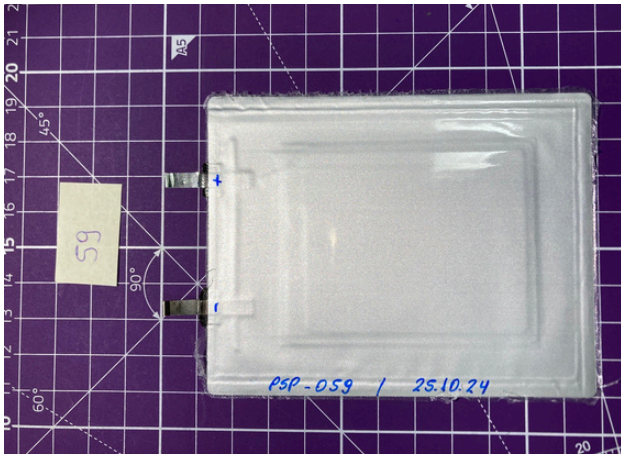


4.

The last units of the Batch 2a monolayer pouch cells were successfully assembled at CIDETEC and shipped to CEA in December 2024: ready for over-temperature abuse testing!



5.

SPINMATE ONE DAY WEBINAR

On 17th of July of 2025 SPINMATE hosted a special webinar, where our consortium partners shared valuable experiences, challenges, and key successes in **lab-scale and pre-upscaling processes**.

If you missed the webinar, don't worry! The webinar recording will be available soon on our YouTube and LinkedIn pages – so you can catch up at your convenience!

"Challenges and optimisations of spray pyrolysis production of NMC811"
***Leif Olav Jøsang** - Production Manager*
Ceramic Powder Technology (Cerpotech SA)

Leif got his MSc in inorganic chemistry from the Norwegian Technical University in Trondheim in 2002, and has more than 20 years of experience in chemistry-related product development. He joined Cerpotech's production team in 2015 and has been responsible for developing spray pyrolysis procedures for new materials. He also takes part in day-to-day production. In SPINMATE, his main role has been to produce the cathode active material NMC811 in close cooperation with his WP3 partners, and especially IREC.

"Characterisation and optimisation of NMC811 cathode active material"
***Marc Nel-lo** - Postdoctoral Researcher*
Fundació Institut en Energia de Catalunya (IREC)

During the SPINMATE project, my primary role focused on the scientific work of optimising and characterising the cathode material NMC811. This involved fine-tuning synthesis parameters to enhance electrochemical performance and meet the project's KPIs. I employed a range of analytical techniques, including XRD, SEM, ICP, and electrochemical testing, to investigate structure-performance relationships. My key contributions included identifying critical synthesis variables, such as calcination temperature, atmosphere, and material stoichiometry, that significantly impact the cathode's discharge capacity. These insights were essential for guiding material development and improving the overall performance of the NMC811 cathode within the project framework.

"Upscaling and solid-state pouch cell assembly: tips from CIDETEC"
***Marta Cazorla Soult** - Researcher*
CIDETEC Energy Storage

Marta Cazorla is a researcher in the Solid-State Batteries team of the Materials for Energy unit at CIDETEC Energy Storage, where she has been working since 2024. She manages European projects and coordinates testing and battery assembly activities within the institution, focusing on the improvement and optimisation of sustainable battery materials and manufacturing processes. Her expertise includes electrochemical characterisation, degradation mechanisms of battery materials, experimental design, and system optimisation. Prior to joining CIDETEC, Marta completed her PhD in Belgium, where she specialised in cobalt-free electrode materials for advanced lithium-ion batteries.

"Optimizing new processes for solid polymer electrolyte upscaling"
***Gérôme Godillot** - R&D Engineer - Battery Materials*
ARKEMA

Gérôme Godillot joined Arkema 10 years ago as an R&D engineer and is now in charge of materials development for solid-state batteries. He is located in GRL, Arkema's research center near Pau, France. His role in SPINMATE is to help the partners to get the most of Arkema's materials for battery, i.e. PVDF, ionic liquids and Li salts. He is also responsible for the scale-up of the membrane production from lab scale (several cm) up to pilot scale (several tens of meters) for many solid-state battery projects.

PROJECT OUTPUTS IN SCIENTIFIC ARTICLES

Our collaborative work continues to make a strong impact in the field of solid-state battery research, with several peer-reviewed articles available. These publications reflect the progress of our partners and the innovative results emerging from our joint efforts.

For further details, visit our full collection of scientific publications:
SPINMATE Scientific Publications

Drivers for Clustering and Inter-Project Collaboration—A Case of Horizon Europe Projects

by Takwa Benissa [1] and Anish Patil [2,*]

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[2] TechConcepts B.V., 2821 LE Stolwijk, The Netherlands
* Author to whom correspondence should be addressed.

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Revealing the impact of CO_2 exposure during calcination on the physicochemical and electrochemical properties of $LiNi_{0.8}Co_{0.1}Mn_{0.1}O_2$

Marc Nel-lo Pascual [a,*], Elías Martínez Moreno [a], Leif Olaf Jøsang [b], Maximiliano Merlo [a] and Jordi Jacas Biendicho [a,*]

[a] Catalonia Institute for Energy Research-IREC, Sant Adriá de Besós, 08930 Barcelona, Spain. E-mail: mnello@irec.cat; jjacas@irec.cat
[b] Cerpotech, Kvenildmyra 6, 7093 Heimdal, Norway

Quasi-solid polymer electrolytes with binary and ternary salt mixtures for high-voltage lithium metal batteries

Views: 842 | Downloads: 437 | Cited: Crossref 1

Nicola Boaretto[1,*], Oihane Garcia-Calvo[2], ... María Martínez-Ibañez[1] + Show Authors

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Author Information · Article Notes · Cite This Article

Research, development, and innovation insights for solid-state lithium battery: laboratory to pilot line production

Perspective | Open access | Published: 21 July 2025
Volume 2, article number 26, (2025) Cite this article

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One step forward to a greener and safer driving

Funded by the European Union

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