The development of next-generation battery (Solid-State) solutions in Europe

SOLID STATE BATTERY INNOVATION

Supporting climate goals

The four EU-funded projects, ASTRABAT, SAFELiMOVE, SOLiDIFY, and SUBLIME, focus on innovative research in the field of next-generation solid-state battery solutions to support energy efficiency across various domains.

This is essential research to support a key area in the framework of the EU Green Deal which is aiming to make Europe climate neutral by 2050. Under this aim energy efficiency should be implemented across all sectors of society and economy, from public administration to businesses, as well as industry. These ambitions can be supported by improved sustainability of battery power and in the reduction of dependancy on scarce resources such as cobalt.

In this context these projects have achieved remarkable results, including for example the development of silicon polymer electrodes for all-solid-state lithium-ion batteries developed in the ASTRABAT project. The SOLiDIFY project has contributed to the development of Li-metal solid-state batteries: cell design, process flow & tools as well as high shelf-life electrolyte precursor chemistry for liquid-processing of composite cathodes. The SAFELiMOVE project has successfully designed, processed, and improved the performance of high loading solid cathode, hybrid ceramic-polymer electrolyte, and current collector free thin lithium metal anode. While the SUBLIME project has strengthened the protective strategies on lithium anode, optimizing NMC cathode and upscaling sulfide solid electrolyte. These projects collectively drive forward battery technology, making it more efficient, sustainable, and cost-effective while enhancing safety and reducing reliance on critical resources.

Key Results

- Significant improvement in energy density thus enhancing the performance of batteries.
- Reduced dependence on critical resources like cobalt in all projects, ensuring resource sustainability.
- Advancements in solid-state battery technology particularly on on solid electrolytes and manufacturing scale-up.
- Development of innovative materials and coatings leading to longer battery lifetimes, faster charging rates and lower costs.
- Strengthening the European battery industry and materials modeling capacity.

The **HRB - Horizon Result Booster** is an initiative funded European Commission, Directorate General for Research and Innovation, Unit J5, Common Service for Horizon 2020 Information and Data.

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Challenges

Transportation
These projects make electric vehicles more practical with longer ranges, shorter charging times, and increased safety. This accelerates the shift from internal combustion engine vehicles to electric vehicles, reducing air pollution and reliance on oil.

Environment
The reduction in critical resource dependence, such as cobalt, promotes resource conservation and minimizes the environmental impact of mining and resource extraction. This contributes to more sustainable and responsible resource management.

Societal
Lower-cost batteries can lead to reduced energy costs for everyone, making clean energy solutions more affordable and accessible to a wider population.

Who benefits?

Industry

Energy Efficiency

Civil Society

Project Group

LCBAT1 2019

ASTRABAT
astrabat.eu
GA 875029

SAFELiMOVE
safelimove.eu
GA 875189

SOLiDIFY
solidify-h2020.eu
GA 875557

SUBLIME
sublime-project.eu
GA 875028

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