



HPB & ZNL Energy: Europeans make progress in solid-state battery

Bergen / Bonn, March 2025

Solid-state batteries are considered the holy grail in the battery industry. They have the potential to fundamentally accelerate the European energy transition and make it more sustainable. Now, two European partners, the German solid-state battery specialist HPB and the Norwegian battery developer ZNL Energy, are reporting significant progress in the development of such solid-state batteries. The goal is to use the advanced separator ZNL-NPx in HPB's innovative solid-state battery.

Through the strategic alliance, the two research-driven industry pioneers have been testing since 2024 whether and how the HPB Solid-State Battery can be optimized with the innovative separator. For ZNL Energy, this partnership at eye level offers the potential to expand the range of applications for its own battery component.

The key component that distinguishes solid-state batteries from conventional lithium-ion batteries is the electrolyte. The Bonn-based company HPB relies on a patented inorganic solid electrolyte, the so-called HPB Solid-State Electrolyte. This is a kind of transport medium for the ions in the battery. It enables the flow of charge between the cathode and the anode. The HPB Solid-State Electrolyte is non-flammable and therefore particularly safe. It also significantly extends the lifespan of the solid-state battery compared to conventional batteries.

ZNL-NP_x is a non-flammable, non-porous separator that provides exceptional thermal stability, eliminating the risk of fire and thermal runaway. Unlike conventional separators, its dense and mechanically robust structure prevents dendrite growth, a critical challenge in solid-state battery technology. This extends battery lifespan while maintaining high energy efficiency.

“Our tests with the ZNL-NP_x have shown that up to 3,300 cycles, there is no reduction in battery longevity or undesirable side effects. On the contrary, the high performance at 1C charge/discharge rate remained unchanged,” says HPB’s Head of Development Department Markus Stichnote. The thinner separator material compared to the glass separator offers the opportunity to increase the specific energy at a given volume. In addition, the material could simplify handling in subsequent series production.

Example of German-Norwegian energy innovation

The progress made in solid-state batteries is a good example of Norwegian-German cooperation for sustainable energy innovation at the corporate level.

Germany and Norway have also been officially working together in an energy partnership since 2023 – for example in offshore wind energy, carbon capture and storage, or hydrogen and batteries.

The results of the cooperation have initiated discussions with key stakeholders on securing global energy storage contracts. HPB and ZNL are working with licensees on the series production of their innovative technologies.

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About HPB

High Performance Battery Technology GmbH is a young company specialising in the research and development of a new generation of batteries with outstanding properties. The HPB Solid-State Battery is characterised by its non-flammability, extreme durability and significantly improved environmental properties – and is already ready for series production thanks to an innovative production process.

HPB cooperates with renowned European plant engineering companies for industrial production.

High Performance Battery Technology GmbH, based in Bonn/DE, is a wholly owned subsidiary of High Performance Battery Holding AG, based in Teufen/CH, which is responsible for financing the research work: highperformancebattery.ch

About ZNL Energy

ZNL Energy is a Norwegian technology company specializing in the development and production of advanced battery separators, with a mission to improve the safety, efficiency, and sustainability of battery technologies. The ZNL-NPx separator is a fire-resistant, high-performance solution designed for lithium-ion, zinc-ion, and sodium-ion batteries, addressing key industry challenges such as thermal runaway, battery lifespan, and supply chain security.

Founded in 2021, ZNL Energy builds on over a decade of research in dry battery manufacturing, offering next-generation separator technology that supports EVs, stationary energy storage, and emerging battery innovations. With a functional lab line in Trondheim, ZNL Energy are advancing towards industrial-scale production, with a pilot manufacturing line planned in Norway by 2026. This will serve as the foundation for future giga-scale separator production, ensuring a secure, sustainable, and high-quality European supply chain.