Battery innovation

Launch of ‘LiSSy’: German Federal Ministry BMFTR funds research project on lithium-sulphur batteries

• Start of the three-year LiSSy research project on lithium-sulphur batteries

• Funding by the Federal Ministry of Research, Technology and Space (BMFTR)

• Business and science: interdisciplinary team with complementary skills

Berlin, July 25th 2025 – The LiSSy (**Li**thium-**S**ulphur **Sy**nergies) research project was officially launched with a successful kick-off meeting in Berlin on 15 July 2025. Funded by the Federal Ministry of Research, Technology and Space (BMFTR) as part of the ‘B@TS’ funding guideline and with a total project budget of EUR 5.3 million, of which EUR 4.13 million is funded, the three-year project aims to further develop a new generation of lithium-sulphur battery cells – resource-efficient, powerful and scalable. The ‘B@TS’ funding guideline pursues the overarching goal of enabling innovations in the field of battery technologies, creating the necessary expertise in science and industry, networking stakeholders synergistically and transferring the concepts generated into application.

‘LiSSy’ focuses on an alternative to conventional lithium-ion technology and is researching the usability of the industrial by-product sulphur for batteries. The project team will create a knowledge pool that brings together the expertise and insights of the various stakeholders and will work towards clearly defined milestones in regular workshops.

Team composition and competencies

Led by theion GmbH, ‘LiSSy’ brings together four partners from industry and science with complementary competencies: theion GmbH, QuanteQ GmbH, Fraunhofer ISIT (FAB-SH) and Helmholtz-Zentrum Berlin. theion coordinates the consortium and contributes its patented technology for sulphur crystallisation, the development of high-performance sulphur cathodes and the design of scalable cell architectures. The aim is to realise lithium-sulphur cells with high energy density for various applications. QuanteQ specialises in compact and powerful laser systems. In the project, it contributes its expertise in laser applications for material processing and cell activation. Fraunhofer ISIT complements the project with its comprehensive expertise in cell characterisation, post-mortem analysis and recycling. The focus is on evaluating performance and ageing behaviour as well as strategies for recycling the materials used. The Helmholtz Centre Berlin contributes state-of-the-art *operando analysis* methods to the project. Using synchrotron radiation and other advanced methods, reaction processes are investigated in real time – such as the formation of polysulphides, the development of interfaces or the growth of dendrites on the lithium anode.

The project goal: raw material sovereignty and a boost to innovation for Europe

LiSSy aims to develop high-performance, safe and scalable lithium-sulphur cells – with energy densities of over 500 Wh/kg and the use of abundant, sustainable materials such as sulphur and lithium. The technology deliberately avoids critical raw materials such as cobalt and nickel, thereby strengthening Europe's raw material sovereignty. At the same time, it promotes knowledge exchange and thus Europe's innovative strength.

About theion GmbH

The Berlin-based company theion develops crystal batteries for mobile, portable and stationary applications. By using sulphur, which is abundantly available in large quantities worldwide, theion aims to reduce the weight, cost and carbon footprint of its batteries to one third of today's batteries. The patented production processes are cost- and energy-efficient. theion's vision is to make a sustainable battery available at low cost and thus drive forward the energy transition. Founded in 2020, theion now employs a team of 20 scientists, engineers and entrepreneurs.

Further information can be found at www.theion.de

About QuanteQ GmbH

Berlin-based QuanteQ GmbH develops and markets the world's most compact high-performance lasers in their class for (micro) material processing.

QuanteQ GmbH's portfolio includes diode-pumped solid-state lasers (DPSS) of various wavelengths, including 355 nm (UV) and 266 nm (DEEP UV), which are characterised by extremely high peak power.

Applications include (micro)marking, microdrilling, microcutting and (micro)material processing.

In addition to its standard products, QuanteQ GmbH also offers customised laser systems for specific customer requirements, such as those in the current LiSSy project.

Further information can be found at www.quanteq.ai

About Fraunhofer ISIT

Fraunhofer ISIT has been conducting intensive research into lithium-ion technology for over 20 years. Its work focuses on:

1. the manufacture of pouch cells – from the preparation of casting compounds and the production of electrodes and separators to cell assembly and electrochemical characterisation.

2. the development of customised cells for special applications.

3. the integration of new materials and components into existing manufacturing processes.

ISIT operates a fully equipped laboratory production line, which, thanks to its high flexibility, offers an ideal technological platform for the development and testing of innovative cell concepts and demonstrators. This line is supplemented by extensive measuring equipment that enables detailed characterisation of materials, cell components and complete cells.

The range of applications extends from batteries for medical technology to electromobility and stationary energy storage systems to modules and complete battery systems. In the field of post-lithium technologies, ISIT is conducting research into lithium-sulphur accumulators, magnesium-sulphur cells and cells with pure silicon anodes.

A unique feature of ISIT is its ability to successfully transfer laboratory processes to an industry-oriented production environment – a decisive advantage in many research and development projects.

About the Helmholtz Centre Berlin (HZB):

The Helmholtz Centre Berlin for Materials and Energy (HZB) is one of Germany's leading research centres in the field of energy materials. As a member of the Helmholtz Association, HZB conducts cutting-edge research on materials and processes for a sustainable energy future, with a focus on photovoltaics, battery technologies, catalysis and quantum materials. With BESSY II, HZB operates a globally recognised synchrotron for X-ray research, which enables in-depth characterisation of materials down to the atomic level. Through its interdisciplinary approach, close cooperation with industry and international partnerships, HZB makes an important contribution to solving major societal challenges in the context of the energy transition and climate protection.