

# PRESS RELEASE

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## Syvairo receives exist Start-up grant for innovative intralogistics solutions in battery cell production

**In European battery cell production, large-scale cleanrooms and dryrooms create significant cost disadvantages compared to Asian competitors. The startup initiative Syvairo addresses this challenge with a patented intralogistics solution known as a mobile Mini-Environment, achieving a reduction in energy consumption of more than 50 percent. With funding approved under the EXIST Research Transfer programme of the German Federal Ministry for Economic Affairs and Energy, the spin-off from Fraunhofer FFB is now transferring this technology into industrial application, paving the way for competitive battery production "Made in Germany."**

**Münster.** The manufacture of battery cells is subject to high standards of cleanliness and dryness, which have previously been met by large clean rooms and dry rooms with dew points as low as -60 °C. The energy required for this is considerable: depending on the degree of scaling, air conditioning alone accounts for around one-third of the production costs of battery cells. "If Europe wants to become competitive in the global battery market, cell production must become more energy- and cost-efficient. This problem is precisely what motivated us to found our company," says Oliver Krätzig, co-founder of Syvairo.

### Potential of Mini-Environments in battery cell production

Syvairo develops, manufactures, and distributes modular intralogistics solutions designed as enabler technology for the industrial use of mini-environment concepts in battery cell production.

Mini-environments are considered a promising approach to reducing energy consumption in battery cell production. Instead of air-conditioning entire production areas at great expense, only individual process steps are enclosed and operated under dry and clean room conditions. In industrial practice, however, the use of such concepts has been limited so far: "The sticking point is the transport of sensitive semi-finished products, such as coated electrode foils, between the individual process steps," explains Marius Heller, co-founder of Syvairo. "In order for the rest of the production area to be air-conditioned normally, these materials must be climate-stable and contamination-free when transferred from one encapsulated process step to the next."

The startup addresses this gap with a patented modular system consisting of transport, airlock, and enclosure components. At its heart is a gas-tight, micro-climate-controlled transport box with integrated sensor technology that functions like a mobile drying room. The transport box docks directly onto the process equipment via compact "door-on-door" airlock systems, allowing materials to be transferred without interrupting the

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## FRAUNHOFER RESEARCH INSTITUTION FOR BATTERY CELL PRODUCTION FFB

climate conditions. This approach makes it possible to reduce energy costs for air conditioning by over 50 percent, thereby sustainably lowering the manufacturing costs of battery cells. The primary use of the technology is in battery cell factories, from pilot to giga factory scale, especially for the production of next-generation battery cells.

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### Expansion of the service portfolio

In addition, Syvairo plans to transfer further research expertise to the start-up and expand its service portfolio in a targeted manner:

- In the future, the mini-environment approach will also be relevant for other industries in which sensitive and/or critical materials must be handled under controlled atmospheres (including the pharmaceutical industry, photovoltaics, and aerospace).
- Another development approach lies in the use of the transport box beyond internal material flow. In the future, climate-stable transport of sensitive materials between different production sites is also planned.
- In addition, Syvairo plans to use a self-sufficient measuring cube that enables fast and precise monitoring and evaluation of the performance and safety of dry and clean room conditions based on wireless IIoT data communication.

### Technology transfer from research to industry

The technological basis for Syvairo was developed within the publicly funded research projects "FoFeBat" and "QueEn" at Fraunhofer FFB. Following further development in the Fraunhofer AHEAD program, the project is now being funded by the EXIST research transfer program of the German Federal Ministry for Economic Affairs and Energy. The funding program specifically supports research-based spin-offs in the critical phase between validated prototype and marketable industrial application.

"The funding gives us the crucial basis for driving forward technological development and company building in parallel," says Krätzig. During the funding phase, the solution approach will be further developed into an industry-ready overall system in Fraunhofer "FFB PreFab" and demonstrated for the first time under real production conditions.

Fraunhofer FFB welcomes this: "The spin-off Syvairo is a very good example of how application-oriented production research can lead to concrete industrial solutions," says Prof. Dr. Achim Kampker, director of Fraunhofer FFB. "With the help of the innovation modules of "FFB PreFab," we are deliberately creating an environment in which start-ups can test their technologies under industry-like conditions and develop them further toward market maturity. We congratulate the entire Syvairo team on receiving EXIST funding and look forward to accompanying them on this path to a marketable product."

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The **Fraunhofer Research Institution for Battery Cell Production FFB** is a facility of the Fraunhofer-Gesellschaft at the Münster site. Its concept provides for a combination of laboratory and production research for different battery cell formats - round cell, prismatic cell and pouch cell. Fraunhofer FFB employees research individual process steps or the entire production chain as required. Together with the project partners – Münster Electrochemical Energy Technology (MEET) at the University of Münster, the Chair PEM of the RWTH Aachen and the Research Center Jülich – the Fraunhofer-Gesellschaft is creating an infrastructure in Münster that will enable small, medium-sized and large companies, as well as research institutions, to test, implement and optimize the near-series production of new batteries. As part of the "FoFeBat" project, the German **Federal Ministry of Research, Technology and Space** and the **state of North Rhine-Westphalia** are funding the establishment of the Fraunhofer FFB with a total of approximately **820 million EUR**. The federal government is providing up to 500 million EUR for research facilities and projects at the Fraunhofer FFB, while the state of North Rhine-Westphalia is investing around 320 million EUR in land and new buildings.

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