



ADAPTIVE BALANCING POWER

Aspiring SME ABP gets energy storage support from EU project STEPS

THE STEPS BUSINESS SUPPORT PROGRAMME

The goal of the STEPS project is to help small and medium-sized enterprises (SMEs) in the North-West Europe region (NWE) bring their energy storage products to the market and increase their competitiveness. STEPS is part of the Interreg NWE programme financed by the European Regional Development Fund (ERDF). The programme consists of two phases, the first of which offers product enhancement support from universities across the NWE region to the top 40 applicants. 20 of these SMEs will be supported with a second phase aimed towards development and demonstrating their technology at suitable testbeds. One of the SMEs supported in the first round of the project is Adaptive Balancing Power.

STEPS is an abbreviation of **Storage of Energy and Power Systems**

We aim to support 40 innovative SMEs in North-West Europe

Adaptive Balancing Power

The company was founded in 2016 in Darmstadt by Dr. Hendrik Schaede-Bodenschatz and Nicolai Meder. The founders have been deeply involved with 4th generation flywheel technology since 2008 and started the development and commercialisation of the Adaptive Balancing Power flywheel packages in 2012. Together with a team of 16 people, they now focus on innovative applications in which the flywheel energy storage systems offer added economic value. During the Business Support Programme of STEPS, they are supported by experts in the energy storage sector from both the Technical University of Darmstadt in Germany and the University of Ghent in Belgium. We asked Hendrik Schaede-Bodenschatz from Adaptive Balancing Power about their company and their participation in STEPS.

What challenges does the commercialisation of the flywheel system involve?

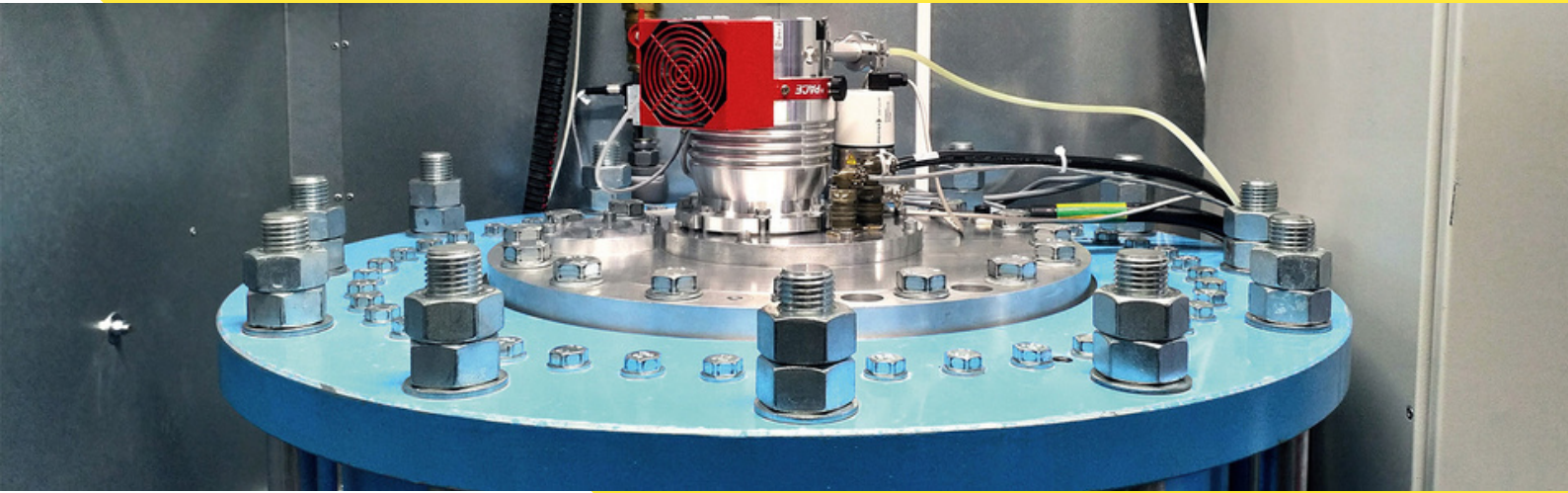
The flywheel is the oldest energy storage technology in the world, and yet in its current stage of development it is something new and unknown for many people. Especially due to electromobility, everyone is focused on batteries and ignores alternative technologies. The battery is truly something great, but it also has weaknesses. For these weaknesses, we position ourselves as a better alternative with flywheel energy storage.



"Batteries are truly something great, but the technology has weaknesses and is the bottleneck of electric mobility. Through the assistance of the STEPS program, we position our alternative energy storage solution to improve fast-charging of battery powered electric vehicles."

At what development stage is your product right now?

Currently, we are entering the market for buffered high power charging stations, with a demonstrator that will be deployed in July. Subsequently, in parallel we prepare to start small batch series production in Q4.



Flywheel technology

Could you briefly explain how a flywheel energy storage system works?

Start by imagining a spinning top. It stores energy in its rotary motion. Now we add an electric motor to the system. This electric motor starts the spinning top to rotate and, like a dynamo on a bicycle, it can convert the rotary movement back into electrical energy. This is how flywheels work. What is special on our flywheel from a technical point of view is that it is made of carbon fibre, which allows for high rotating speeds and consequently high energy capacity. To maximise the system's efficiency, it is operated in high vacuum conditions and levitated by contact-free magnetic bearings, which also minimise system wear and maintenance.

What is the advantage of a flywheel energy storage system compared to other energy storage systems, e.g. Batteries?

First, a flywheel is not a chemical energy storage system, but a mechatronic one. As a result, issues such as material sourcing, water conservation or even recycling are solved since decades. Furthermore, flywheels have a high, very dynamic performance. Batteries are significantly more sluggish in their responsiveness. Finally, flywheel energy storages have a significantly longer service life. While stationary batteries have up to 10,000 charging cycles in the best case, our system, for example, can have more than 1,000,000 charging cycles – without any loss of performance or capacity, making it a sustainable option.

What are the most promising application fields of the flywheel energy storage system in the coming years?

There will never be a shortage of promising opportunities for energy storage systems. The task is to turn these promising opportunities into real ones. This calls for action from policymakers, among others, who still place too much emphasis on inefficiency. The topic of grid-oriented fast charging of electric vehicles is currently on our agenda. The trend here is toward even higher charging speeds, especially in the lower price segment. Upcoming battery-electric trucks and buses will burden the power grids with even higher demand peaks and hence provide great opportunities for products like ours. Otherwise, we still see opportunities in advanced microgrids as well as uninterruptible power supplies (UPS). Above all, system services for power grids as part of the energy transition will sooner or later become very important. Here in particular, we are keeping a close eye on political developments that are needed to start this market.



Steps Forward

How will the STEPS Business Support Programme help your company to bring your product to the market?

Within the STEPS programme we are looking at two things: What are the detailed regulations we need to follow to connect our system to the power grid in other EU Member states? And, a super interesting topic, how will EV-Charging look in the future? What types of cars will be in the fleet and how will their charging profile look like? This is a very important topic in terms of the product-market fit.

Contact details

[Adaptive Balancing Power](#)

[LinkedIn](#)

[STEPS](#)

Authors

ABP - Dr.-Ing Hendrik Schaede & Nicolai Meder
TU Darmstadt - Thomas Franzelin

Editors

Bax & Company - Caitlin Ball & Juliska van Doren

What are your business expectations and ambitions for the future?

In the context of the energy transition, the topics of power grid stabilisation and the simultaneous provision of high, punctual power, such as in high power charging stations or industry, are becoming more and more important. Research and work are being performed on these issues. High-performance energy storages are one important technical aspect of the solution needed to become a renewable society. This market is expected to have volume of 2.5 billion euros in 2025. So, we are only at the beginning of a development that we, as Adaptive Balancing Power, would like to actively contribute to shaping.