

Flywheel energy storage austria

An holistic approach, which goes well beyond energy storage alone requires competence and experience in many technical disciplines.

Innovative charging and storage solutions have become much more important due to the growing availability of renewable energies such as solar, wind and hydro power and the increases in the field of electromobility. They are intended to store power generation surpluses for those times when renewables are not supplying electricity, in order to increase grid stability and to provide an adequate charging infrastructure. With FlyGrid, a project consortium consisting of universities, energy suppliers, companies and start-ups presents the prototype of a flywheel storage system that has been integrated into a fully automated fast charging station, thus enabling the improved use of local volatile sources.

In addition to energy storage and delivery, the project developed a holistic concept around storage that also takes into account aspects of energy supply, grid load and charging infrastructure. This is reflected in FlyGrid's intended areas of application. Among other things, local volatile sources such as PV systems are to be integrated, whose energy can be stored not only for charging but also for feeding high power into the grid. FlyGrid could also be used as a mobile fast-charging box, e.g. for electrified construction machinery. In the field of charging technology, project partner easelink contributed its fully automated charging system Matrix Charging.

"The increasing electrification of mobility and also of industry as well as the expansion of volatile renewable energy sources are a challenge for our electricity grids. Therefore, it is important to offer solutions that on the one hand relieve the electricity grid and on the other hand facilitate the use of e-mobility," explains project leader Armin Buchroithner from the Institute of Electrical Measurement and Sensor Systems at Graz University of Technology (TU Graz). "In addition to solutions such as chemical batteries or pumped-storage power plants, FlyGrid's flywheel storage offers a long-lasting system that provides high performance. This makes FlyGrid a useful addition that supports the shift to renewable energy on a smaller and larger scale."

This project is funded by the Climate and Energy Fund and is carried out as part of the "Lighthouses of Electromobility" programme. In addition to TU Graz, the following project partners are involved:

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In Austria, under the leadership of the Technical University of Graz (TU Graz), a consortium of universities, energy providers, companies and start-ups have presented the prototype of a flywheel storage system called FlyGrid. This was integrated into a fast-charging station and is meant to enable improved use of renewable (and thus fluctuating) energy sources.

The buffer storage system prototype has a capacity of 5 kWh and a charging power of up to 100 kW. According to TU Graz, larger storage quantities should be possible thanks to the prototype's modular design.

For mechanical energy storage, a rotor – the eponymous flywheel – is accelerated to a high speed by means of an electric motor and the energy is stored as rotational energy. If the rotational energy is to be used, the storage unit transfers it to a generator. The rotor is made of carbon fibre so that it is robust and can withstand a high centrifugal force. This is decisive for the amount of energy that can be stored.

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