Israel flywheel energy storage

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As EV adoption grows, the demand for ultra-fast charging is increasing. However, the higher power levels required for ultra-fast charging are expected to exceed the capacity of today"s grid transmission and distribution systems in many areas.

"At ZOOZ Power we are solving the bottleneck between growing ultra-fast charging needs and limited grid capabilities by providing our bridging solution that maximises existing grid capacities until full grid enhancements can be implemented," Udi Tzuri, ZOOZ Power"s Head of Product, tells Auto Futures.

"It supplements the grid"s power with bursts of stored kinetic energy. This allows ultra-fast EV chargers to operate at their full charging speeds using a combination of grid power and the ZOOZTER"s added power boost - circumventing the need for immediate grid upgrades to enable ultra-fast charging," he explains.

The ZOOZTER 100 works by storing kinetic energy in a high-speed steel flywheel rotating at 17,000 rpm inside a sealed vacuum chamber. The vacuum environment and magnetic bearings minimise friction and energy losses, providing up to 200,000 high-power charge/discharge cycles over a 15-year lifespan.

"Unlike batteries that have a limited number of charge/discharge cycles (often less than 5,000) before needing replacement, flywheels can provide up to 200,000 high-power charge/discharge cycles over a 15-year lifespan," says Tzuri.

"This significantly reduces the need for frequent replacements, lowering operational costs and minimising environmental impact from battery disposal. Additionally, flywheels store energy mechanically as rotating kinetic energy, eliminating the use of toxic and flammable chemicals found in batteries."

At present, ZOOZTER 100 systems are operating in three sites in Israel, in partnership with Afcon and Dor-Alon - the country"s leading ultra-fast charging network operators. Previously the sites were limited due to the available grid power.

"In the US we are soon starting pilots with New York Power Authority (NYPA) in upstate New York and with a big car rental company at LaGuardia airport. We have more projects in the pipeline with major CPOs (Charge Point Operators) and fleet operators, which we will announce once finalised. Stay tuned for more updates!" says Tzuri.

"The easily relocatable nature of our power boosters is a key selling point in our international expansion. This feature maximises value for our partners and accelerates charging infrastructure rollout, allowing us to quickly enter new markets and adapt to changing needs."

"By focusing on these strengths, we aim to position ourselves as a global leader in enabling rapid, flexible deployment of ultra-fast charging infrastructure, supporting the worldwide transition to electric vehicles," he adds.

"However, a significant challenge remains in getting there - the mismatch between the power demands of these stations and existing grid capabilities. While grid enhancements will be ongoing, they require substantial time and investment. Power boosting technologies will play a crucial role in bridging this gap. By supplementing grid power with stored energy, they"ll enable ultra-fast chargers to operate at full speed even in locations with grid constraints."

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