



Microgrids

E-VEHICLE SUPERCHARGERS IN AUSTRIA MORE RELIABLE THANKS TO mtu BATTERY SYSTEMS

Pull over, fill up, drive on – without losing time. What drivers of petrol-powered automobiles have long taken for granted will, over time, become the new norm for E-drivers too. Many utility grids tend to reach overload when having to cope with several E-vehicles being charged at the same time, or with super-chargers that are demanding high power delivery quickly. Now SYNERG-E, an EU-funded tech project, is helping E-vehicle service stations overcome these challenges at several locations in Austria. How? With stationary battery storage systems carrying the Rolls-Royce brand *mtu*.



A Rolls-Royce
solution

Who: VERBUND's trading platform Verbund Energy4Business GmbH
What: Six *mtu* EnergyPacks QM, each delivering 500 kVA / 550 kWh
Where: Innsbruck, Bergkirchen and Feldkirchen near Graz, plus three further locations planned in Austria

E-mobility is one of industry's most transformative trends and today the focus not only of untiring development work and state subsidizing, but also endless debate. The reasons why E-drives have become a talking point are manifold: increasingly aware of the benefits, more and more people are choosing to swap their petrol-powered automobiles for vehicles with an electric drive. The advantages speak for themselves: energy-efficiency, no local carbon emissions, low running and maintenance costs, and virtually silent operation.

But there is one big sticking point: the infrastructure for public charging stations, which attracts criticism for its lack of charging points and excessively slow and complicated charging. Many local utility grids indeed tend to reach overload when several E-vehicles are being charged simultaneously in one place, or when high power is being drawn off by supercharger stations within a short space of time – as frequently happens in busy places such as motorway service areas, shopping centers, and petrol stations. Furthermore, in the long-term, the growing number of supercharger stations is set to create stability problems in Europe's power network.

***mtu* battery storage systems shave peak loads induced by E-vehicle super-charging**

The SYNERG-E project is to provide the solution to both these challenges: operators of super-charger stations can be sure of a reliable power supply, while transmission system operators benefit from extra electrical power. With that end in mind, Austrian electricity company Verbund Solutions and E-mobility providers Smartrics and Allego have joined forces as project partners. Between 2018 and 2019, they set up supercharger stations at three locations in Austria – in Innsbruck, Bergkirchen and Feldkirchen near Graz. Each is equipped with four charging points able to power up an E-vehicle in just a few minutes. Three further locations are planned.



Full storage capacity

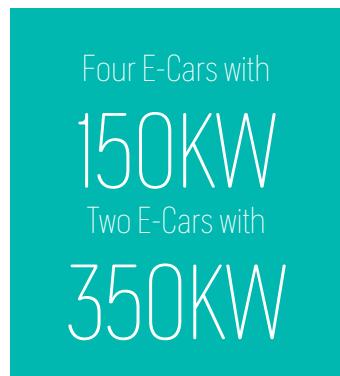
The battery containers in the SYNERG-E project are around six meters long, almost three meters high and weigh up to 14 tons.

1 E-fast charging stations equipped with *mtu*-battery storage

The overall system of the fast charging stations consists of the mains connection, the battery, the charging stations and a microgrid management system.

2 Sustainable energy solutions

mtu battery storage systems are central components of Rolls-Royce's economical microgrid solutions. They make a positive contribution to energy sustainability and guarantee a reliable power supply for individual customer requirements.



The key role in the project is played by mtu-brand stationary storage batteries from Rolls-Royce which provide the much-needed buffer between the charging stations and the utility grid. "The mtu-brand EnergyPacks QM each deliver 500 kVA/ 550 kWh for performing peak shaving at times of high demand," explained Alexander Flunk, project manager at Rolls-Royce Solutions Berlin.

"The mtu-EnergyPacks reduce demand charges that would otherwise be incurred at peak times and make the e-charging stations independent of load bottlenecks in the local power grid".

Alexander Flunk
Projektleiter von Rolls-Royce Solutions Berlin (ehemals Qinous)

"They help to avoid the high network charges that arise during peak hours and render the charging stations invulnerable to overload situations occurring on the local power grid." mtu battery storage is central to the highly cost-effective microgrid solutions being offered by Rolls-Royce. mtu storage batteries make a positive contribution to energy sustainability and secure a reliable power supply that meets the needs of individual customers.

Surplus power for the operating reserve market

"The system as a whole basically comprises the grid connection, battery, charging points and microgrid management system. As operators, we gain from the two core functions that our super-reliable mtu-brand storage batteries perform in our project," explained Karl

Potz, head of Power Solutions at VERBUND Energy4Business GmbH. "Not only do they smooth out the fluctuations in the local power demand caused by supercharger stations, they also provide additional grid services for transmission system operators." The surplus energy stored in the batteries is marketed by VERBUND Energy4Business as operating reserve, thereby helping to counteract stability problems in the public utility grid.

mtu EnergyPacks provide a scalable, all-in-one solution

mtu EnergyPacks are based on lithium-ion cells that have high cycle efficiency, thereby enabling an average service life of around 15 years. Their job is to store energy from the local power grid and make it available to the supercharger stations as and when required. The battery containers in the SYNERG-E project are some 6m long and 3m high and can weigh up to 14 tons. mtu EnergyPacks are generally available as scalable all-in-one solutions that boast fast power delivery and charging and a low maintenance requirement.

"With mtu EnergyPacks, simultaneous charging of up to four E-vehicles with 150 kW or two vehicles with 350 kW is now possible at our service locations without overloading the local utility grid," explained Karl Potz from Verbund Energy4Business GmbH.

"They compensate fluctuations in the local electricity demand of our ultra-fast charging stations and provide additional network services for system operators".

Karl Potz
Head of Power Solutions in der VERBUND Energy4Business GmbH





Ultra-fast charging stations for electric vehicles
Pull up, make a quick refill and keep driving – the fast charging stations from The SYNERG-E-project are designed for those who drive electric cars everyday.

A central monitoring system controls overall operation of the supercharger stations by optimizing power generation and deployment in accordance with their particular needs.

“With this concept, drivers of electric vehicles can look forward to a sustainable future”

Karl Potz
Head of Power Solutions at VERBUND Energy4Business GmbH

Energy and transport synergies for the whole of Europe

60% of the SYNERG-E project is financed by the 'Connecting Europe Facility', a funding instrument of the European Commission. The total project volume is 8.7 million euros. The aim of the project is to demonstrate the performance capabilities, reliability and interplay of individual components at work in the energy and transport segments. The technology and related business model are then to be implemented at a later date at other locations spread throughout Europe. "Our supercharging stations have been in continual service for over a year now and we're seeing very positive results," reported Karl Potz from Verbund Energy4Business GmbH. "With this concept, E-vehicle drivers can look to the future with confidence."

Pull up, tank up, and drive on – without losing time. That'll soon be the new norm for E-vehicle drivers too.

Rolls-Royce provides world-class power solutions and complete lifecycle support under our product and solution brand *mtu*. Through digitalization and electrification, we strive to develop drive and power generation solutions that are even cleaner and smarter and thus provide answers to the challenges posed by the rapidly growing societal demands for energy and mobility. We deliver and service

comprehensive, powerful and reliable systems, based on both gas and diesel engines, as well as electrified hybrid systems. These clean and technologically advanced solutions serve our customers in the marine and infrastructure sectors worldwide.