

Second life energy storage: VHH and MAN testing use of second life of batteries for eBus charging station

Verkehrsbetriebe Hamburg-Holstein GmbH (VHH) and MAN Truck & Bus are jointly researching the second life of used battery storage systems so that they can be used in electric buses.

- **VHH and MAN signed Memorandum of Understanding (MoU) on reuse of batteries from electric buses to store energy at the depot for charging stations**
- **Aim: sustainable use of batteries, stabilisation of electricity demand when charging electric buses**
- **Project is part of the mobility partnership between Free and Hanseatic City of Hamburg and Volkswagen Group**

The battery is the heart of an electric vehicle. Using a battery in an eBus means that the battery has to handle a great deal, from the high mileage of the vehicles to the daily charging cycles and high performance requirements. As a result, the capacity of the batteries decreases over the course of a vehicle's life, and at some point, the required range can no longer be achieved – MAN expects the batteries used in our eBuses to last at least six years. Given the long service life of an average city bus of 12 years, the batteries would have to be replaced but still be able to manage a certain capacity.

The question is what to do with the batteries. Disposing of them directly is neither ecologically nor economically sound. For this reason, VHH and MAN Truck & Bus want to jointly test the second life of these batteries in a stationary storage facility, as they expressed in a Memorandum of Understanding (MoU) signed on 16 March 2018 in Munich.

This second life storage, as it is known, is designed to prevent power consumption peaks during bus charging (peak shaving) by filling up on charge during quieter periods, which the buses can then use at peak times.

MAN Truck & Bus is one of Europe's leading commercial vehicle manufacturers and transport solution providers, with an annual revenue of some 9 billion euros (2016). The company's product portfolio includes vans, trucks, buses/coaches and diesel and gas engines along with services related to passenger and cargo transport. MAN Truck & Bus is a company of Volkswagen Truck & Bus GmbH and employs more than 35,000 people worldwide.

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This saves costs and stabilises utilisation of the power grid, which is the intention of the participants. Further insights are expected on the aging behaviour of the batteries, the life cycles of future batteries and battery technologies, as well as opportunities to stabilise the electricity grid through use of electric transport. The prototype of the stationary storage facility is to start operating in Hamburg-Bergedorf during the course of the year. This involves working with used batteries obtained from vehicle testing, with cells of the type that will also be used in MAN's eBuses.

"This project underlines our aspiration to provide our customers with a complete range of electrification solutions for their fleet," emphasised Florian Hondele, Project Manager at MAN Transport Solutions. The MAN Transport Solutions team of consultants has been supporting transport companies and freight forwarders since last year in all matters relating to the transition to alternative drive systems and, in particular, electric vehicles.

The joint testing of second life storage is part of the innovation partnership between MAN Truck & Bus and VHH. "Switching to electric transport means much more than just the purchase of electric buses. The testing of the second life energy storage unit fits in perfectly with our holistic strategy," said Toralf Müller, Managing Director of VHH.

The research is part of the transport partnership between the Free and Hanseatic City of Hamburg and the Volkswagen Group, which also includes MAN. Together, the partners are working on innovative solutions to make urban transport more environmentally friendly, safer, more reliable and more efficient. One area of focus here is promoting electric-powered vehicles, which should result in fewer emissions and less noise in the city. As part of the partnership with the city, around 150 electrified Volkswagen vehicles are already on the streets of Hamburg. From the end of 2018, MAN electric buses will transport Hamburg's residents through the city.

"We are about to make crucial strides in the development of vehicle batteries. And we want to play an important role as a vehicle manufacturer," says Felix Kybart, Head of Alternative Drives at MAN Truck & Bus, on the occasion of the signing of the contract. And this does not end with the delivery of the vehicles – it also includes the secondary use of batteries and recycling.

Vekehrsbetriebe Hamburg-Holstein GmbH (VHH), headquartered in Hamburg, transports more than 100 million passengers per year, employing 1,600 people from 60 nations. Their fleet includes 527 buses. VHH is investing in the future with the switch to electric transport. Two electric buses have been in regular use since 2014. More eBuses have been



ordered. An electric bus workshop is under construction and will open in summer 2018.

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