

Press release

Vienna, 30.09.2021

ELECTROMOBILITY: ULTRA-FAST CHARGING FOR HEAVY DUTY VEHICLES

AIT and partners develop fast charging station and suitable infrastructure for heavy duty vehicles and buses

Vienna (AIT): The decarbonisation of transport is an essential building block for achieving climate targets. The complete electrification of heavy duty vehicles and buses still requires innovative approaches and an intelligent high-performance charging infrastructure. Researchers from the AIT are working with their partners AVL List, EnerCharge, Infineon Technologies Austria and Xelectrix Power on the MEDUSA project to develop a ultra fast charging station and infrastructure for heavy duty vehicles, buses and trucks in the multi-megawatt range.

According to the European Environment Agency, heavy-duty vehicles, such as buses or trucks, are responsible for almost 5% of total greenhouse gas emissions in the EU and for around 27% of CO₂ emissions in road transport. Only by significantly reducing CO₂ emissions in this segment can climate targets be met. This requires new, innovative approaches that make the switch to electric vehicle fleets more attractive for companies and enable the technological prerequisites for ultra-fast charging at special charging stations.

MEDUSA: Fast charging stations for the medium-voltage grid

The MEDUSA project stands for Multi-Megawatt Medium-Voltage Fast Charging. In the second phase of the project for the first time in Europe there will be developed a demonstrator for a multi-megawatt fast charging station that will be directly coupled to the medium-voltage grid.

"The power of 3 megawatts is required for fast charging a long-haul truck. Providing this high power is a big challenge for the distribution grid. Therefore, in the project we are working with selected partners who have the technological know-how to develop a multi-megawatt fast charging station with direct medium-voltage grid connection as well as grid-stabilising properties. In the future, these charging columns should enable both a fast charge of 3 megawatts or several charges of 150 kilowatts, which corresponds to the demand of about 20 cars," explains Markus Makoschitz, project manager and senior scientist at the AIT Center for Energy. Furthermore, CO₂ emissions are to be reduced by connecting battery storage systems in combination with solar power technology.

Technological pioneering role of project partners essential for development

The development of a fast-charging infrastructure for the medium-voltage grid and the increased integration of renewable energies requires the combination of several technologies. In the MEDUSA project, the experts of the AIT Center for Energy contribute their technological expertise in the field of smart grids as well as know-how for the investigation of interactions between electric vehicles, charging infrastructure and the electrical energy system. In addition, with the SmartEST, the AIT Center for Energy has a unique laboratory infrastructure in which all components of the

technical ecosystem of the e-vehicle charging infrastructure can be simulated in real hardware or in the form of a real-time emulation. The experts at AVL List GmbH contribute their comprehensive application knowledge of the overall electric vehicle system, including knowledge and experience of charging and discharging processes and the technology to master them efficiently and safely. EnerCharge GmbH offers specific know-how and experience in the field of charging infrastructure solutions for cars and buses as well as modular ultrasonic fast charging systems with up to half a megawatt. The project partner Infineon Technologies Austria AG, as the world's leading supplier of semiconductor solutions in the fields of automotive and industrial electronics, among others, focuses on the development of innovative solutions in the field of energy conversion. The experts at Xelectrix Power GmbH will develop modular energy storage solutions for the charging infrastructure of heavy commercial vehicles.

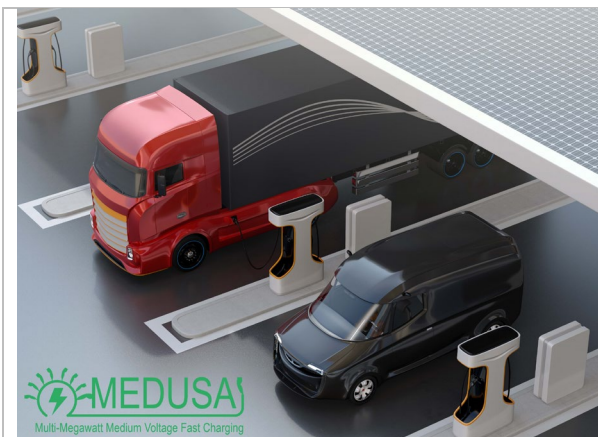
About MEDUSA

The MEDUSA initiative (Multi-Megawatt Medium-Voltage fast Charging) is divided into two sub-projects. In the first project phase (05/2021 to 10/2022), the requirements definitions, the topological implementation as well as the design and comparison of several solutions and a small-scale concept demonstration will be prepared. The second project phase will focus on the construction of a large-scale demonstrator as well as analyses of the geographical conditions and traffic flows coupled with network simulation. The construction of the demonstrator is based on the results of phase 1.

The MEDUSA project is funded under Zero Emission Mobility, a research and demonstration programme of the Climate and Energy Fund in the field of sustainable mobility and energy supply. <https://www.klimafonds.gv.at/call/zero-emission-mobility-2021/>

MEDUSA-Projectpartner

AIT Austrian Institute of Technology GmbH, AVL List GmbH, EnerCharge GmbH, Infineon Technologies Austria AG und Xelectrix Power GmbH.



BU: In the MEDUSA project, a rapid charging station for heavy vehicles and passenger cars with a capacity of 3 megawatts is being developed. The development of an intelligent high-performance charging infrastructure is an essential building block for the complete electrification of heavy duty vehicles and buses. ©GettyImages/ Chesky_W, bearbeitet.

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