



VPS – VIRTUAL CAR PARK STORAGE SYSTEM

Advanced System Technology AST

Am Vogelherd 50
98693 Ilmenau, Germany

Contact

Dipl.-Ing. Alexander Arnoldt
Phone +49 3677 461-183
alexander.arnoldt@iosb-ast.fraunhofer.de

Dipl.-Wirtsch.-Inf. Oliver Warweg
Phone +49 3677 461-111
oliver.warweg@iosb-ast.fraunhofer.de

www.iosb-ast.fraunhofer.de

Challenge

Electro mobility is of particular importance in the context of climate change and the transformation of transportation. The share of electro mobility in the overall transport market will increase over the next few years. However, this increase also means that a number of challenges have to be overcome: In addition to switching the electrical energy supply to renewable energies, it must also be ensured that sufficient charging stations are available for the vehicles so that the electricity demand can be constantly covered. Multi-story car parks are a sensible location for charging cars when drivers are not using their vehicles. In order to make the best possible use of the efficiency of these charging stations, the development of a virtual car park storage system (VPS) is a suitable solution.

Coupling parking and charging

Within the planned project a solution will be developed which combines the possibility of coupling parking and charging with innovative energy management services regarding semi-public parking space. Besides a new and merchantable solution, the project provides a network-supporting system solution.

The aim of the project is to research and test an innovative concept for the pooling of virtual multi-story car parks and the provision of the resulting flexibility on the energy market. The integration of partners not only ensures that the project is technically and economically close to its application, but also achieves a high public impact, which significantly improves market prospects.

Targets

For the realization of the virtual multi-story car park storage:

- a cost-effective local solution for the virtualization of available charging stations in a multi-story car park into a virtual multi-story car park storage (VPS system) will be developed,
- a system for the aggregation of several multi-story car park storages will be realized via a hierarchical approach (VPS aggregator),
- the commercialization of flexibility is enabled through easy access to the available capacity by the market participants and
- the various players such as parking users, multi-story car park operators and energy supply companies will be integrated via a corresponding platform with individual, interactive user interfaces.

Analysis of virtualization

Information on the VPS system and the platform is required to define specific loads. In a first step, forecasts of the necessary influencing variables, such as the load of the vehicles, are to be carried out.

Conception of the VPS system

After extensive analyses, the methods for predicting the local VPS system and the methods for planning and operating the total storage in the VPS aggregator will be designed. Technologies of the Fraunhofer IOSB-AST and the participating partners will be used.

Implementation of system specifications

In this phase, the VPS aggregator system and the necessary interfaces between the systems are developed. Subsequently, field tests and simulations will evaluate the developments on the basis of the collected data and identify improvement potentials.

Partner

- HKW Elektronik GmbH
- Technical University Ilmenau, Department of Energy Usage Optimization
- Fraunhofer IOSB-AST
- Airport Erfurt GmbH
- JustON GmbH
- Stadtwerke Erfurt (associated partner)

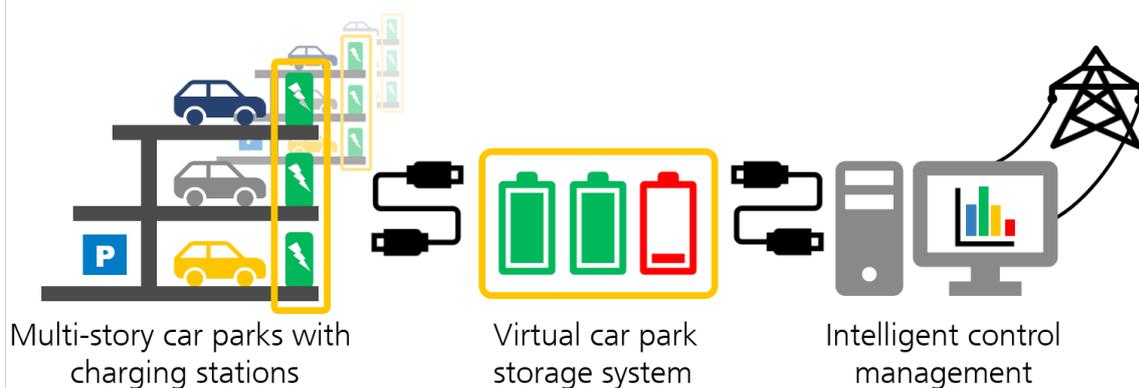


FIGURE 1: Scheme of the virtual car park storage system VPS