

Charging infrastructure for a fleet of electric buses



The Zurich Public Transport Authority (Verkehrsbetriebe Zürich, or VBZ) is planning to purchase a fleet of electric buses to secure service along the Authority's district and standard routes. In connection with this undertaking, EBP was commissioned to work out the details of a charging infrastructure for the Hardau Garage.

Electric buses are expected to become an important means of public transportation in many cities in the near future. The aim of EBP's work on behalf of the VBZ was to provide a basis for decision making relating to an appropriate charging infrastructure and to outline the details (e.g. relating to scheduling, costs and construction management) of a corresponding infrastructure development project. The specifications include ensuring the needs-based and timely planning of the charging infrastructure at the Hardau Garage to secure the operation of a fleet of battery-electric district and standard buses. The scope of the assignment also included taking account of forward compatibility in relation to a final infrastructure status in the year 2030.

In the context of the project, EBP developed and evaluated various implementation alternatives for a charging infrastructure for electric buses, which was particularly challenging given the aim of arriving at a good solution for the specified overnight charging priority with a high simultaneity factor. Consideration was also to be given to high output peaks and limited garage space, as well as to options for feeding surplus electricity from the photovoltaic arrays into the grid and using second-life battery clusters for the interim storage of surplus electricity produced during the day.

Client

Zurich Public Transport Authority (VBZ)

Facts

Period 2018

Project Country Switzerland

Contact persons

Silvan Rosser
silvan.rosser@ebp.ch

Hanspeter Abegg
hanspeter.abegg@ebp.ch

After working out the details mentioned above, EBP went on to submit recommendations relating to an appropriate charging management system (CMS). Such systems monitor and control the overall charging output, as well as the charging output of the individual charging stations. This enables one to cap output peaks and linearize consumption.

EBP's report also outlines a number of viable alternatives for the necessary electrical substation. The rough estimate of the costs of each of the proposed charging-infrastructure alternatives takes account of key data relating to grid-connection fees and the garage itself, including its electrical and HVAC systems.

Finally, EBP drafted a schedule for planning the construction project and submitted an estimate of the costs, including the costs of obtaining a building permit and drafting a call to tender.

Picture Credits: Verkehrsbetriebe Zürich (VBZ)