

Abstract

c) Synopsis

The intended result of the follow-up industrial research project is a flexible control and configuration platform for battery- storage- systems for to allow for a variety of grid supporting applications by facilitating a rapid, simple, and therefore more cost-effective adaptation to various grid configurations and control requirements.

This exploratory projects goal is to provide a solid basis for decision making from a technical and economical point of view for grid operators Costs, risks and potentials of the tested storage solutions will be identified.

d) **Abstract**

Changing the electricity generation structure towards distributed generation opens new challenges for grid operators. In particular the growing share of fluctuating renewable energy sources requires new concepts for load balancing to ensure the necessary security of supply and power quality. Such concepts require a high degree of flexibility in the generation system provided by either flexible power plant capacities, shiftable consumption (demand response), remote-controlled renewable generation, or smart and integrated energy storage systems. Battery storage systems thereby represent an interesting alternative. Benefits are good controllability and a fast response time. Mobile storage systems can be quickly facilitated to support network congestions, therefore to accelerate the implementation of renewable energies. Since battery storage systems are currently too expensive to be widely adopted, the follow-up project chameleonStore works on a flexible control and configuration platform to enable easier and faster adaptation of battery storage systems in different applications. Thus, the application development costs could be reduced and the share of renewable energy increased.

The first step of this pre-project is the collection of technical requirements and user demands. This will be achieved through experts-interviews.

In the meantime information of available battery storage systems are collected and analyzed in detail to check the suitability for flexible and multifunctional grid operation. Based on the results, indicators for an evaluation matrix are derived, which determines potentially suitable battery storage systems.

In addition the operation of battery storage systems is analyzed for grid operators through examination of the regulatory and legal framework. Contractual options constellations are to be shown through the survey of the current legal position that enables grid operators to use battery storage systems for grid supporting operation.



With the help of simulations, dedicated storage models and exemplary network sections selected battery storage systems are dimensioned and tested with suitable control algorithms to ensure a support for grid operation. In an economic analysis, the costs of the possible demonstration plants are charged taking into account installation, operation and recycling. In addition, it is determined which configurations are essential in grids (e.g. cable length, age, type of transformer) in order to justify the use of storage systems.

The result of this project is a catalogue of requirements for flexible and universal battery storage systems and a comparison of available products, which can meet those requirements. Through the survey, simulation and evaluation of the necessary functionality that is set (in the follow-up project to be developed) for a control and configuration platform "chameleonStore".