



# AlpStore

Strategies to use a variety of mobile and stationary storages  
to allow for extended accessibility and the integration of renewable energies

## Battery systems to increase the self- consumption of photovoltaic electricity in private households

Opportunities and threats for regional energy supplier

Bachelor Thesis

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## Abstract

On the one hand electricity produced by a photovoltaic power plant on house roofs is free of CO<sub>2</sub> emission and therefore supports to reach the energy goals but on the other hand only few parts of the produced energy is used directly in time. Therefore within a project it has to be investigated which possibilities should be advised to store electricity from photovoltaic energy plants.

Object of this thesis is the elaboration of the opportunities and threats of battery systems for photovoltaic energy storage concerning municipal utilities and to discuss them. Using the Allgäuer Überlandwerk GmbH as an example of the regional energy utility.

After a short introduction and the declaration of the methodical basics the grad of autarcy and the quote of internal consumption in existing buildings with photovoltaic power plants is estimated to measure the level of the potential.

With the use of a customer survey the experiences such as the desires of the customers with photovoltaic power plants according to batteries have been investigated.

To sum up the customer survey offers that:

- The rate of internal consumption amounts between 30 % and 50 %
- There is a large demand in battery storage systems, but the costs are too high
- Also ecological aspects lead to a potential investigation. Financial aspects resulting an positive value in the future are not in the foreground
- Independency of the energy provider are not decisive

To identify the Opportunities and Threats a SWOT-Analysis has been accomplished and shown in chapter 4. The determining frame conditions in some parts are only concerning to the AÜW, so consequently the strategic suggestions are concerning to energy utilities with similar structure only. External factors (Opportunities and Threats) were observed closer. Furthermore internal factors (Strengths and Weaknesses) were included. Summing up there are 4 strategic scenarios as a result:

- S-O-Strategy: active product supply right now
- S-T-Strategy: Research and product offer in the future
- W-O-Strategy: product offer with partners
- W-T-Strategy: no product offer at all

Due to the customer survey there is already a large interest in battery storage systems. According to declining value of produced electricity just as increasing costs for electricity and furthermore declining cost of battery systems, the demand on them could still rise in the future. This opportunity should be taken by the municipal utilities. Counting the threats the unclear market trend just as the uncertain political framework - the stopped subsidies in



particular - should not be neglected. Cause of these reasons under today's circumstances the reluctant S-T-Strategy should be supported. In this case the strengths of a municipal utility are used and the threats are not let out of consideration.

Keeping track of the market development is one of the main advices. In the framework of projects special business models for energy suppliers can be developed and tested. In case of differing external conditions a fast reaction and supply of a product is possible. For market entrance cooperation could be a possibility to avoid weaknesses of municipal utilities.