Master Thesis

TECHNISCHE UNIVERSITÄT DARMSTADT

Elektrische Energieversorgung unter Einsatz Erneuerbarer Energien

Influence of reactive power provision methods on the design of PV and (community) energy storage systems

Background

Due to the increasing integration of decentralized power generation systems, distribution network operators are dealing with growing challenges. Low investment costs and high electricity prices of PV are making them more attractive. A decisive criterion for the design of new PV-plants is often the voltage maintenance in low load cases. In order to comply with the required limits, the network operator provides the subscriber with a method defining certain requirements regarding the reactive power provision and that should be considered in the design process. According to VDE AR 4105, there are three methods that can define the requirements of the reactive power provision.

Tasks

The aim of this work is to analyse the influence of the existing methods that define the requirements of the reactive power provision on the design of PV and (community) storage systems.

In addition, the work includes the following subtasks:

- Development of method of the reactive power provision for power plants in LV-networks (based on VDE AR 4105)
- Integration of the developed methods into the modelling environment and their formulation as an optimization problem
- Comparison of the methods using test-networks
- Analysis and interpretation of the results

Knowledge

Basic knowledge in load flow calculation.
Basic knowledge in Matlab programming.

Contact

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