

Determination of an Optimized Energy Storage Size for a Wind Farm based on Wind Forecasts

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Abstract

The use of renewable energies is steadily growing. Wind energy is in Germany the majority installed form of the renewables and mainly installed in the north at sea levels and on the low mountain ranges. Due to the fluctuations and the difficult forecast of the wind, the energy feed into the grid is independent of the demand of energy. A storage can help here e.g. to prevent high peak powers, to support the grid with delayed energy transfer or to reduce the reserve power needed for fluctuating sources. Unclear is the required size of the storage (power, energy) if it's used with a certain facility.

This paper describes how ATP is used as a calculation program to estimate the storage dimensions using facility information, storage data and one year historical wind trends. With this trends were wind prognoses generated and in a multi-simulation the storage limits were figured out. In the simulation a special storage management where used to work with the best operation mode for the wind facility/storage system.