

Filling the gap in testing and characterization for grid-connected storage systems

Clarifying the performance criteria for grid-connected storage systems

Clarifying the performance criteria and the associated characterization methods for DER components to be connected to smart electricity grids is a major task for the safe and secure transformation of the power system. Among the many different types of DER components, the research in the DERri consortium focuses on the two ones for which the largest gaps have been identified: grid-connected storages and large scale DER inverters. The results for storage systems are described here.

Technology neutral comparison of grid-connected storage systems

Through their unique specificity of being at the same time power supplies and load management systems, electricity storage systems are key components to enable the transition towards higher shares of DER in the electricity grids.

In order to compare the different energy storage system available, we defined dedicated procedures from a technology neutral point of view and looking at the important criteria for grid connected applications.

Then, four power profiles derived from the applications with the highest added value to the grid have been identified.

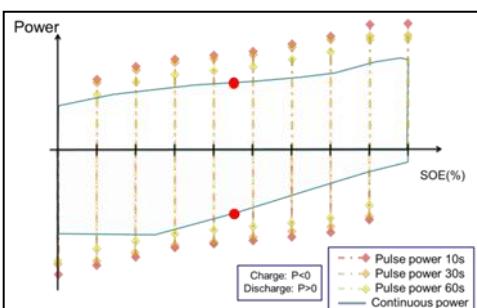


Figure 1: Representation of the state of available power as a function of the state of energy of the energy storage systems

Deeper understanding of energy storage systems

Compared to existing approaches, our work provides a deeper understanding of the energy storage system, especially in terms of availability of power and efficiency. These approach allows us to compare efficiently different energy storage systems and to evaluate their ability to respond to a given application.

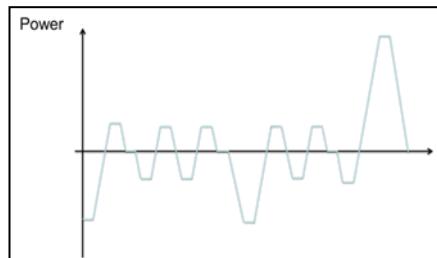


Figure 2: Standardized power profile for frequency regulation application

The developed testing methods are used in the test platforms of the DERri infrastructures, thus improving the quality of the access provided to their users.

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Results:

- Deeper understanding of the energy storage system regarding availability of power and efficiency
- Definition of procedures for testing grid connected storage systems
- New testing methods used in the DERri test platforms
- Improved quality of access for users

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