

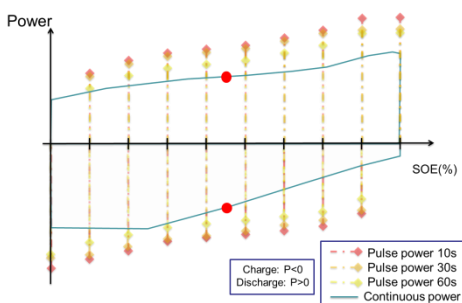
# Performance criteria evaluation and life-time prediction for grid-connected storage systems



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

## Technology neutral comparison of grid-connected storage systems

To facilitate the comparison of different energy storage systems gaps in existing methods were identified and dedicated procedures looking at the important criteria for grid connected applications were defined .



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

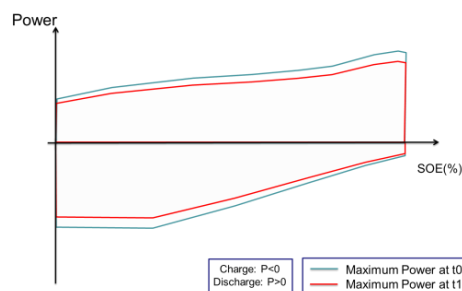
## Deeper understanding of energy storage systems

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

The new methodology has been applied to different storage systems available within the DERri project consortium and the associated procedures have been adjusted regarding the experienced feedback.

## New approach towards performance criteria evaluation and life-time prediction

The first part of the work focused on performance criteria such as power, energy and efficiency. The second part focused on life-time prediction. The historical approach consisting in a "arbitrary" definition of the end of the life of the device as the time where the loss of performance reached a certain level of the energy contained or of the power available was totally revised. The DERri approach allows the energy storage operator to estimate the performance degradation of the ESS, thus allowing for decisions to improve the technical-economic performance of storage systems.



Power availability degradation

## Optimized asset management

The results have already been presented at normative working group. The testing recommendations will be further discussed with ESS operators. Used as asset management tool, the DERri approach improves the operation (better knowledge of performance) and allows for an optimized scheduling of maintenance (better knowledge of performance evolution).

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## Results:

- Procedures for performance testing of grid connected storage systems defined
- Procedures for life-time prediction of grid connected storage systems defined
- Testing procedures validated for a variety of storage systems

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