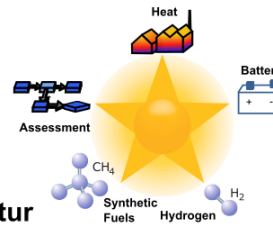


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## The Value of Energy Storage: The Good, The Bad and the Ugly

*Monday, 24 October 2016 10:10 (30 minutes)*

### Summary

Energy storage can provide valuable flexibility to power systems and help with the integration of large shares of variable and uncertain renewable generation. However investment costs remain high for storage technologies. In addition, there are many competing, often lower cost sources of flexibility. EASAC's (European Academies Science Advisory Council) soon to be published report "Valuing Dedicated Storage in Electricity Grids" considers the scope for the expansion of energy storage in electricity grids. The current status of electricity storage technologies is reviewed, as well as the potential impact of recent and expected developments in storage technologies. The talk includes an overview of existing and potential applications of energy storage within the power system. Modelling methodologies, including gaps and priorities for further research, and findings from a selection of modelling assessments are also presented.

In addition to exploring the role of large scale storage systems on transmission and distribution grids to meet the growing needs for flexibility, this report also pays particular attention to small scale storage on distribution grids and the growing interest in increased self-consumption, which has different drivers, different potential applications and different values to the grid.

Energy storage has a potential role providing regulated functions, as well as participating in competitive markets, and frameworks should exist which allow storage assets to be used for both. As many other flexibility options exist, it is important that the market design is technology neutral, and unnecessary barriers to the full participation of energy storage should be removed. The value of energy storage is highly location and system specific. Storage is highly valuable to isolated systems, particularly as shares of variable renewables increase. Certain high value niche applications also exist although the market size is limited. While significant cost reductions and performance improvements are likely, the current trajectory is not sufficient for wide-scale adoption, at least in the medium term. At present, there are no viable options for dedicated seasonal energy storage. As such, imbalances at this scale will be addressed by competing solutions (interconnection, conventional generation, integrated energy systems) which will also provide significant completion for short-term storage solutions.

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