

BEYOND COST REDUCTION: A NEW METHOD TO IMPROVE THE VALUE OF TECHNOLOGIES IN ENERGY SYSTEMS

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Overview

An energy technology is valuable if it makes energy systems cheaper. Traditional ways to improve technologies are to reduce their costs; however, the cheapest technology is not always the most valuable in energy systems. New methods can help guiding technology innovation.

Methods

The presentation will use as case study our recent work on the value of energy storage. We review techno-economic storage valuation methods and expands them by the new proposed 'market potential method' which derives a system-value by examining the capacities obtained from a long-term investment planning optimisation. We apply and compare this method to other cost metrics in a renewables-based European power system model, covering diverse energy storage technologies.

Results

We find that characteristics of high-cost hydrogen storage can be equally or even more valuable than low-cost hydrogen storage. Additionally, we show that modifying the freedom of storage sizing and component interactions can make the energy system 10% cheaper and impact the value of technologies, for instance, by decreasing the value of Li-batteries.

Conclusions

The results suggest to look beyond the pure cost reduction paradigm and focus on developing technologies with value approaches that can truly lead to cheaper energy systems in future. One practical and useful value method to guide energy technology innovation could be the 'market potential method' which might be more required than ever in the face of net-zero futures.

References

M. Parzen, F. Neumann, A.H. Van der Weijde, D. Friedrich, A. Kiprakis, Beyond cost reduction: Improving the Value of Energy Storage in the Electricity System (2021), URL: <https://arxiv.org/abs/2101.10092> (accessed on 31 Jan 2021)