

## Grid level energy storage

Key EES technologies include Pumped Hydroelectric Storage (PHS), Compressed Air Energy Storage (CAES), Advanced Battery Energy Storage (ABES), Flywheel Energy Storage (FES), Thermal Energy Storage (TES), and Hydrogen Energy Storage (HES).<sup>16</sup> PHS and CAES are large-scale technologies capable of discharge times of tens of hours and power capacities up to 1 GW, but are geographically limited.<sup>17</sup> ABES and FES have lower power and shorter discharge times (from seconds to 6 hours), and are often not limited by geography.<sup>17</sup>

2. Whittingham, S. (2012) History, Evolution, and Future Status of Energy Storage. Proceedings of the Institute of Electrical and Electronics Engineers (IEEE).<https://ieeexplore.ieee/document/6184265>

7. NREL (2016) "Batteries 101 Series: How to Talk About Batteries and Power-To-Energy Ratios."<https://#:~:text=The%20more%20accurate%20term%20is%20the%20power%20rating,or%20absorb%20over%20the%20course%20of%20an%20hour.>

11. U.S. DOE (2022) 2022 Grid Energy Storage Technology Cost and Performance Assessment.<https://www.energy.gov/eere/energy-storage/2022-grid-energy-storage-technology-cost-and-performance-assessment.pdf>

18. Gør, T. M. (2018). "Review of electrical energy storage technologies, materials and systems: challenges and prospects for large-scale grid storage." Energy & Environmental Science, 11(10), 2696-2767.<https://pubs.rsc/en/content/articlepdf/2018/ee/c8ee01419a>

22. The American Clean Power Association (ACP) (2023) "Mechanical Energy Storage."<https://cleanpower.org/facts/clean-energy-storage/mechanical-electricity-storage/>

26. Sioshansi, R., et al. (2012) Market and Policy Barriers to Deployment of Energy Storage.<https://pdfs.semanticscholar.org/a188/e9578e0d2319257cae3db2f1e0c88475348a.pdf>

28. Arbabzadeh, M., et al. (2017) "Parameters driving environmental performance of energy storage systems across grid applications." Journal of Energy Storage 12: 11-28.

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