

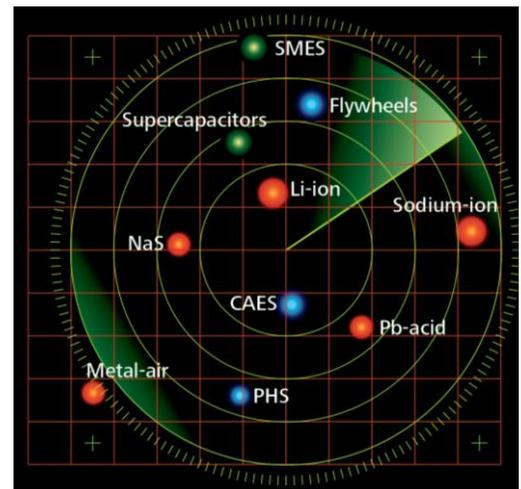
Energy Storage Revolution: The drivers, technologies, and applications of importance

Storage to transform the power sector

The world's population is expected to grow by two billion people by 2050 and global energy demand is expected to roughly double during the same period. At the same time, the power sector is on the brink of a major transformation as more stakeholders consider distributed generation. However, the penetration of renewable technologies has been hampered by their costs, intermittency, and variability, which reduces availability and induces grid instability.

Energy storage is the pivotal technology that will reshape the energy sector by enabling widespread adoption and grid-integration of renewables. As transmission lines affect where electricity is consumed, energy storage influences when it is consumed. Thus, consumers are provided the flexibility to become power generators and to select the price point for electricity consumption, while utilities gain the agility to accommodate producers and consumers with disparate behaviors. Regulators are recognizing the value of storage and are creating policies that improve the business case for adoption.

Advancements in materials and manufacturing have improved the economics of storage. Traditional technologies, such as pumped hydro, have limited applicability and are losing market share to emerging battery technologies, many of which are leveraging experience in transportation and consumer electronics to compete in the power sector. In addition, there are numerous disruptive technologies under development that offer the potential of step change improvements in performance or cost. The multitude of options and the ever emerging technologies make it difficult to decide which technology to adopt and when. To assist decision makers, Deloitte has conducted a study to evaluate the business case of storage technologies within various customer classes.



Soon to be released report!

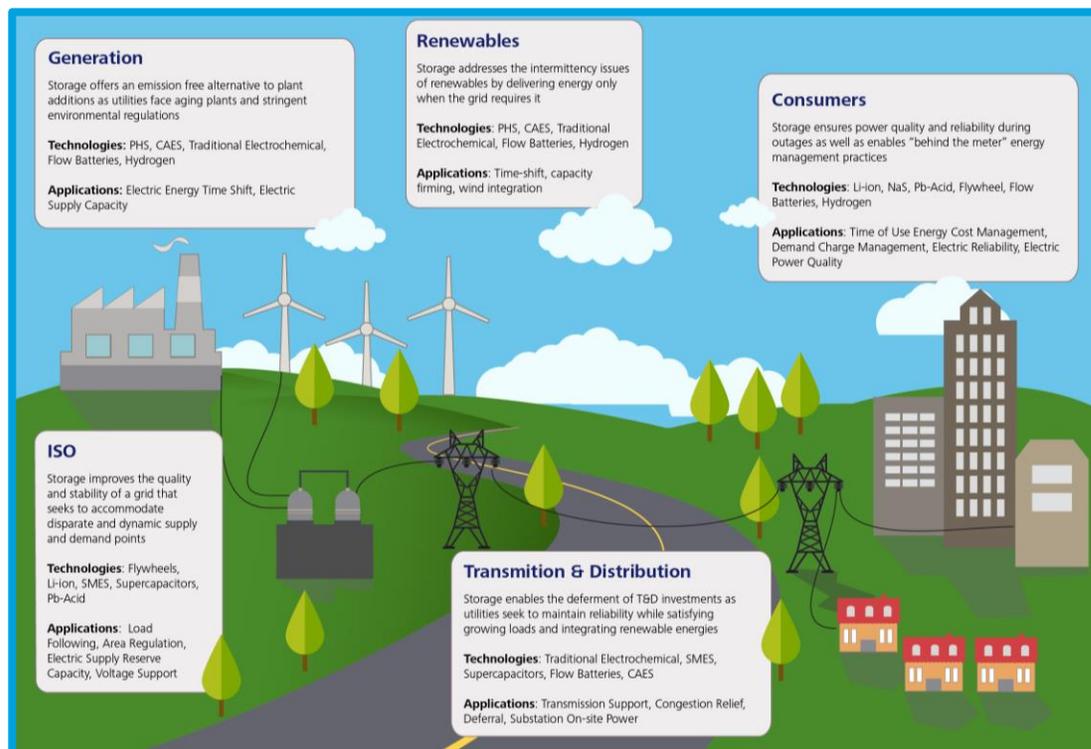
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Summary

The report explores the range of technologies and applications that are contributing to the energy storage narrative and in doing so the report:

- provides a broad view of the value proposition for available technologies
- explores the potential technologies in development
- assists decision makers as they seek to narrow the field of storage technologies
- identifies feasible technologies for the various customer classes
- evaluates the strategic implications across stakeholders including developers, users, and regulators

The impact of energy storage is far reaching as not only does it address the issues that have limited renewable energy, but it fundamentally alters the long-standing relationship between utilities and their customers. The disruptive potential of storage is unlike other energy technologies in that it pervasively extends across the value chain in a way that stakeholders will impact and be impacted by its adoption. To remain a casual observer is to risk disruption as even non-power companies are entering the market. If the decision is to adopt, there is a need to translate the technical parameters of storage into financial implications to understand the bottom-line impact. If the decision is to not adopt, there is still a need to respect the interdependencies of the ecosystem and evaluate potential impacts to the business and operating model. Either way, the transformational potential of storage requires that stakeholders develop robust strategies for the impending disruption.



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