

Long-term non-lithium energy storage technology development

What are long-duration energy storage technologies?

In this paper, we loosely define long-duration energy storage technologies as ones that at minimum can provide inter-day applications. Long-duration energy storage projects usually have large energy ratings, targeting different markets compared with many short duration energy storage projects.

Are lithium-ion batteries good for long-duration applications?

While lithium-ion batteries dominate the energy storage market, they are not always the best fit for long-duration applications.

How does the technology landscape affect long-duration energy storage?

The technology landscape may allow for a diverse range of storage applications based on land availability and duration need, which may be location dependent. These insights are valuable to guide the development of long-duration energy storage projects and inspire potential use cases for different long-duration energy storage technologies.

Are long-duration energy storage technologies environmentally sound?

Ongoing research is critical to ensuring that long-duration energy storage technologies are environmentally sound, as well as expanding the methods that can be used to store energy.

How do you compare long-duration energy storage technologies (LDEs)?

Review commercially emerging long-duration energy storage technologies (LDES). Compare equivalent efficiency including idle losses for long duration storage. Compare land footprint that is critical to market entry and project deployment. Compare capital cost-duration curve.

Are long-duration energy storage technologies a stabilizer for new power systems?

Long-duration energy-storage technologies: A stabilizer for new power systems. The Innovation Energy 2:100077. Against the backdrop of realizing the target of "carbon peak and carbon neutrality", renewable energy sources such as wind and solar power have developed rapidly.

The 2022 Inflation Reduction Act (IRA) ushered in a new era for the role of clean energy and storage in the transition to green energy. It also created an opportunity for non-lithium battery ...

Non-lithium battery alternatives, such as vanadium flow, non-vanadium flow, and sodium-ion batteries, offer scalable, safer, and more cost-effective solutions for stationary ...

In the short term, some analysts expect flat or even increasing pricing for battery storage. In addition, BNEF and others indicate changes in lithium-ion chemistry (e.g., switching from ...



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Indication of future research directions towards further improved Li-ion batteries. Proposal of key performance indicators for the mid- & long-term future development. ...



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