Energy storage innovations

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On July 25, 2023, DOE"s Office of Electricity launched the $15 million Storage Innovations 2030: Technology Liftoff (SI Liftoff) funding opportunity announcement (FOA) to enable long-duration energy storage technologies through durable research partnerships. SI Liftoff aims to leverage the Flight Paths listening session conversations and analytical Framework results, both described in the Technology Strategy Assessments released on July 19, 2023, to accelerate partnerships and enable pre-competitive R& D projects that have the potential to benefit entire technology industries.

Energy storage is undergoing a rapid transformation wherein research is underway to develop efficient long-lasting solutions. It is a critical component of the manufacturing, service, renewable energy, and portable electronics industries. Currently, the energy storage sector is focusing on improving energy consumption capacities to ensure stable and economic power system operations. Broadly, trends in energy storage solutions can be categorized into three concepts:

For this in-depth research on the top global decarbonization trends and startups, we analyzed a sample of 1366 global startups & scaleups. This data-driven research provides innovation intelligence that helps you improve strategic decision-making by giving you an overview of emerging technologies and trends in the energy industry. In the Energy Storage Innovation Map, you get a comprehensive overview of the innovation trends & startups that impact your company.

These insights are derived by working with our Big Data & Artificial Intelligence-powered StartUs Insights Discovery Platform, covering 4.7M+ startups & scaleups globally. As the world"s largest resource for data on emerging companies, the SaaS platform enables you to identify relevant technologies and industry trends quickly & exhaustively.

Based on the Energy Storage Innovation Map, the Tree Map below illustrates the impact of the Top 10 Energy Industry Trends. Companies and research organizations are developing advanced lithium battery chemistries and lithium alternatives. These innovations combat the peak energy demand from the grid. The immediate need to control this energy demand is advancing utility-scale and distributed energy storage solutions.

The Global Startup Heat Map below highlights the global distribution of the 1366 exemplary startups & scaleups that we analyzed for this research. Created through the StartUs Insights Discovery Platform, the Heat Map reveals that the UK and US see the most startup activity, followed by other Western European countries.

Below, you get to meet 20 out of these 1366 promising startups & scaleups as well as the solutions they develop. These energy storage startups are hand-picked based on criteria such as founding year, location, funding raised, and more. Depending on your specific needs, your top picks might look entirely different.

Lithium-ion batteries offer advantages such as portability, fast recharging, low maintenance, and versatility. However, they are extremely flammable, sensitive to high temperatures, require overcharge or complete discharge protection, and suffer from aging. Moreover, there is a huge environmental implication to mining the components for battery manufacturing.

Therefore, startups are modifying lithium-ion batteries to increase their performance and lifetime. To achieve this, lighter and energy-dense materials like li-polymer, li-air, li-titanate, and li-sulfur replace the traditional lithium-cobalt electrodes. In addition, some startups recycle used batteries, advancing the circular economy.

Green Li-ion is a Singaporean startup that recycles lithium-ion batteries to produce battery cathode. The startup’s modular processing plants use co-precipitation hydrometallurgical technology in contrast to the conventional processes that use leaching reagents. This results in purity enhancement while reducing the production time of the rejuvenated cathode. Battery manufacturers utilize this solution for recycling batteries without the need for sorting.

UK-based startup Echion Technologies produces lithium-ion battery anode material for super fast charging. The startup’s anode material uses a proprietary mixed niobium oxide (XNO) technology which includes designing microcrystals with diffused lithium-ion. This enables fast charging without the need to use nanosized powders. Due to their high energy density, the applications of these anodes range from consumer electronics to the EV industry.

Lithium batteries are not environmentally friendly and it is hard to keep up with the increasing demand for lithium. These limitations are encouraging companies to look for alternative battery materials that power the next generation of battery storage. For instance, zinc-air batteries are a viable alternative to lithium given zinc"s abundant supply, inherent stability, and low toxicity.

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