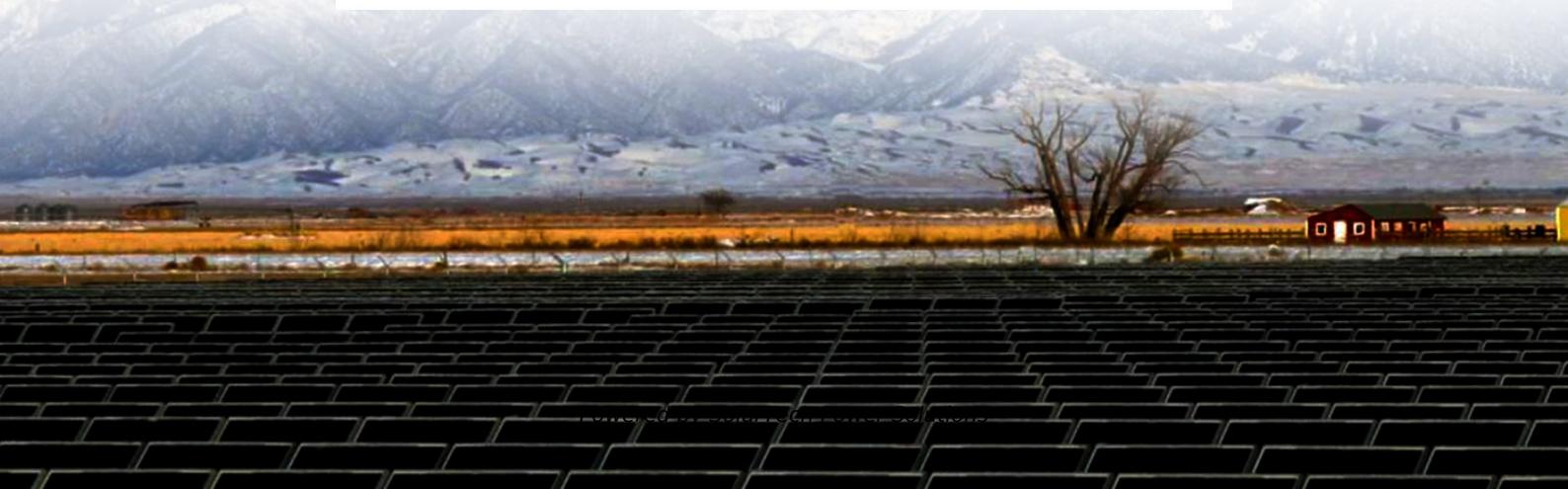


# **Differences between flywheel energy storage and chemical energy storage**



## Overview

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What is the difference between a flywheel and a battery storage system?

Flywheel Systems are more suited for applications that require rapid energy bursts, such as power grid stabilization, frequency regulation, and backup power for critical infrastructure. Battery Storage is typically a better choice for long-term energy storage, such as for renewable energy systems (solar or wind) or home energy storage.

What is a flywheel energy storage system?

Flywheel energy storage systems offer a unique and efficient alternative to traditional battery systems, with advantages in speed, lifespan, and environmental impact. While battery storage remains the dominant choice for long-term energy storage, flywheel systems are well-suited for applications requiring rapid energy release and frequent cycling.

How can flywheels be more competitive to batteries?

The use of new materials and compact designs will increase the specific energy and energy density to make flywheels more competitive to batteries. Other opportunities are new applications in energy harvest, hybrid energy systems, and flywheel's secondary functionality apart from energy storage.

How much energy can a flywheel store?

The small energy storage composite flywheel of American company Powerthu can operate at 53000 rpm and store 0.53 kWh of energy . The superconducting flywheel energy storage system developed by the Japan Railway Technology Research Institute has a rotational speed of 6000 rpm and a single unit energy storage capacity of 100 kW·h.

What is a flywheel/kinetic energy storage system (fess)?

Thanks to the unique advantages such as long life cycles, high power density, minimal environmental impact, and high power quality such as fast response

and voltage stability, the flywheel/kinetic energy storage system (FESS) is gaining attention recently.

How long do flywheel energy storage systems last?

This can also be seen in Table 4.3, where the installed rated power of flywheel energy storage systems is significantly higher than the installed rated capacity. Compared to battery storage systems, flywheel storage systems have a long service life of more than 20 years in most cases.

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