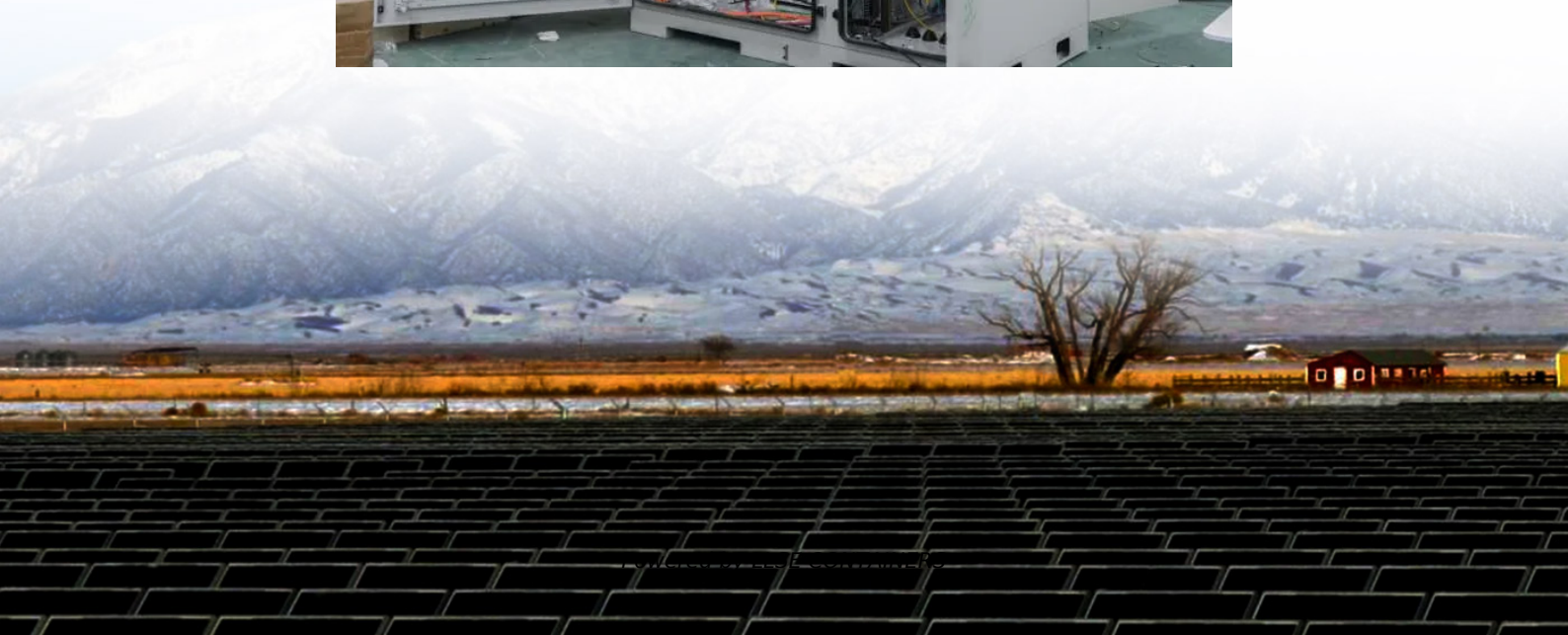


Superconducting energy storage device smes





Overview

Superconducting Magnetic Energy Storage (SMES) is an innovative system that employs superconducting coils to store electrical energy directly as electromagnetic energy, which can then be released back into the grid or other loads as needed. What is superconducting magnetic energy storage (SMES)?

This CTW description focuses on Superconducting Magnetic Energy Storage (SMES). This technology is based on three concepts that do not apply to other energy storage technologies (EPRI, 2002). First, some materials carry current with no resistive losses. Second, electric currents produce magnetic fields.

What is the difference between SMEs and superconducting materials?

Both use superconducting materials but store energy in different physical forms (magnetic fields versus rotational motion). SMES stores energy in a persistent direct current flowing through a superconducting coil, producing a magnetic field.

Will SMEs be used in energy storage applications?

While SMES offers an incredibly unique advantage over other energy storage applications and is truly state-of-the-art technology, SMES is unlikely to be widely adopted in most energy storage applications in the near future. Currently, superconducting materials are limited in their capabilities and supply.

How does a SMES system store electrical energy?

However, SMES systems store electrical energy in the form of a magnetic field via the flow of DC in a coil. This coil is comprised of a superconducting material with zero electrical resistance, making the creation of the magnetic field perfectly efficient.



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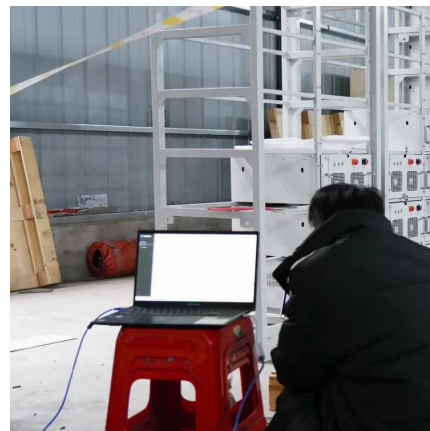
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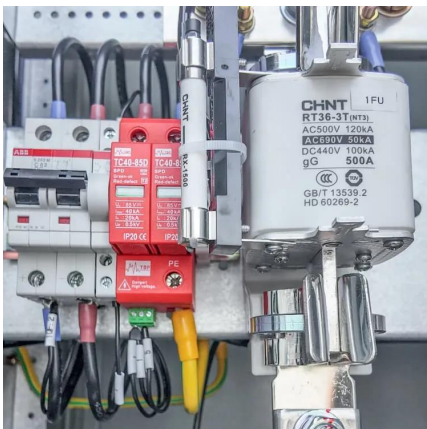
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Introduction
Feasibility of Technology and Operational Necessities
Status of The Technology and Its Future Market Potential
Contribution of The Technology to Economic Development
Financial Requirements and Costs
References
The combination of the three fundamental principles (current with no restrictive losses; magnetic fields; and energy storage in a magnetic field) provides the potential for the highly efficient storage of



electrical energy in a superconducting coil. Operationally, SMES is different from other storage technologies in that a continuously circulating See more on ctc-n

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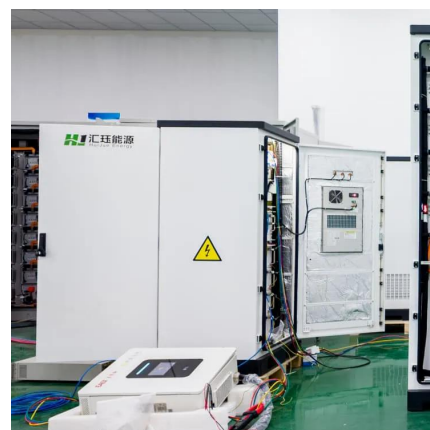


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