

# **Superconducting energy storage device SMES and its price**





## Overview

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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.

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.

How does a superconductor store energy?

**The Coil and the Superconductor** The superconducting coil, the heart of the SMES system, stores energy in the magnetic field generated by a circulating current (EPRI, 2002). The maximum stored energy is determined by two factors: a) the size and geometry of the coil, which determines the inductance of the coil.

How is SMEs different from other storage technologies?

Operationally, SMES is different from other storage technologies in that a continuously circulating current within the superconducting coil produces the stored energy. In addition, the only conversion process in the SMES system is from AC to DC.



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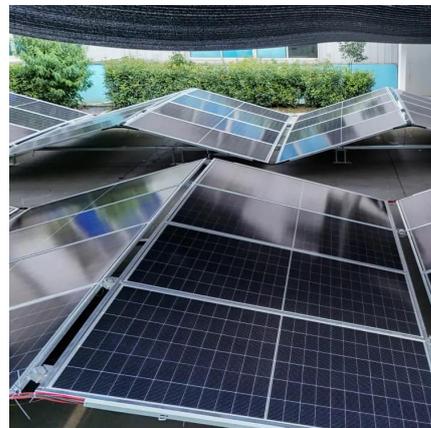
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