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Can thermal energy storage revolutionize industrial energy systems?
7. Conclusions Thermal energy storage (TES) has the potentialto revolutionize industrial energy systems by optimizing energy use,enhancing efficiency,and reducing environmental impacts.

What is thermal energy storage?
Thermal Energy Storage (TES) can have a significant role in the industrial energy system to assist the decarbonization of industrial energy while at the same time increasing industrial energy flexibility and security [7,8]. TES enables a higher share of renewable energy in industries and facilitates waste heat recovery.

How efficient are electrochemical storage systems?
Electrochemical storage systems,notably lithium-ion batteries,have demonstrated round-trip efficiencies as high as 90%and energy densities of approximately 150-250 Wh/kg [31,33].

How effective is rock thermal storage?
However, the effectiveness of rock thermal storage depends on factors such as thermal conductivity, porosity, and heat transfer efficiency, influencing system scalability and energy dispatch capabilities . Liquid Air Energy Storage (LAES) is a cryogenic storage solution that uses the liquefaction of air at -196 °C to store energy .

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