



MODERNIZATION SOLAR

Solar energy energy storage coal-to-electricity





Overview

Can coal power plants be converted into energy storage and zero-carbon data centers?

This paper investigates a retrofitting strategy that turns coal power plants into thermal energy storage (TES) and zero-carbon data centers (DCs). The proposed capacity expansion model considers the co-locations of DCs, local renewable generation, and energy storage with the system-level coal retirement and retrofitting.

Will solar power push coal power into reverse?

Global electricity generation from solar will quadruple by 2030 and help to push coal power into reverse, according to Carbon Brief analysis of data from the International Energy Agency (IEA).

How can coal power plants be repurposed?

Retrofitting coal power plants provides a cost-saving solution by reusing the existing infrastructure and interconnections. They can be repurposed into thermal energy storage (TES), nuclear reactors, and data centers (DCs). These projects could significantly reduce carbon footprint and facilitate renewable energy integration.

Are coal power plants a carbon emitter?

Coal power plants are the largest carbon emission source in the world and contributed to 15% of the total emissions in 2020. The total capacity of U.S. coal power plants reached 204 GW by 2020. Decarbonizing power systems requires the early retirement of high-emitting coal power plants and the integration of renewable energy.



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