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# Underground energy storage solutions for open-pit coal mines

What are underground energy storage and geothermal applications?

Underground energy storage and geothermal applications are applicable to closed underground mines. Usually, UPHES and geothermal applications are proposed at closed coal mines, and CAES plants also are analyzed in abandoned salt mines. Geothermal power plants require flooded mines, which generally have closed more than 5 years ago.

Can abandoned coal mine facilities be used to generate energy?

Thus, the abandoned mine facilities are efficiently used to generate both electrical and thermal renewable energy. Fig. 5. Combined design of underground energy storage systems (UPHES and CAES) and geothermal utilization in an abandoned underground coal mine. 6.2. UPHES system at Lieres mine

What is an underground closed mine?

An underground closed mine can be used to store energy for re-use and also for geothermal energy generation, providing competitive renewable energy with a low CO<sub>2</sub> footprint. These initiatives aid to ensure sustainable economic development of communities after mine closure.

## 1. Introduction

Can abandoned mines be used for energy storage?

Closed mines can be used for the implementation of plants of energy generation with low environmental impact. This paper explores the use of abandoned mines for Underground Pumped Hydroelectric Energy Storage (UPHES), Compressed Air Energy Storage (CAES) plants and geothermal applications.

The utilization of Underground Pumped Storage Power Systems (UPSP) addresses the growing need for energy storage in the face of increasing intermittent energy ...

From capturing sunlight in vast expanses of open-pit mines, to optimising energy production through compressed air storage in underground mines, these innovations hold the ...

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The mining industry, serving as a cornerstone of the global economy, plays a pivotal role in driving economic growth on a global ...

Martin Morris finds out what are the advantages and challenges in converting abandoned mines for energy storage.

Why Old Coal Mines Are Becoming Hotspots for Clean Energy abandoned coal pits that once symbolized environmental concerns now breathing new life as energy storage powerhouses. ...

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An international team of scientists recently proposed another innovative and resourceful solution that involves repurposing old mines: ...

For instance, China has actively promoted the deployment of PV systems in various contexts, including deserts, coal mining subsidence zones, open-pit mine dumps and ...

These same urban areas are also major sources of waste heat, suggesting strong potential for thermal energy storage. This PhD project proposes that abandoned coal mines can be fully ...

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