

EQACC SOLAR

Fast charging of energy storage containers used in the Male tunnel



Overview

Can underground tunnels be used as heat exchangers?

This paper presents an unprecedented investigation of the thermal energy storage potential of underground tunnels used as heat exchangers, often called energy tunnels, with a focus on seasonal, medium-temperature thermal energy storage applications. The study is divided into two parts.

Can energy tunnels be used as underground thermal energy storage systems?

Additionally, Rotta Loria (2021) evaluated the potential of energy tunnels as underground thermal energy storage systems and discovered that storage efficiencies could reach up to 70%.

How do energy tunnels work?

In fact, through diverse shapes in contact with the ground (e.g., prisms with cylindrical, egg-shaped, squared, or rectangular cross-sections), energy tunnels and other underground infrastructures involve an uncharted energy performance for heat storage.

Why are energy tunnels important?

A significant feature of energy tunnels, similar to other underground infrastructures, is that they are characterized by a relatively low surface-area-to-volume ratio [, ,] – a valuable attribute for the effective storage of thermal energy.

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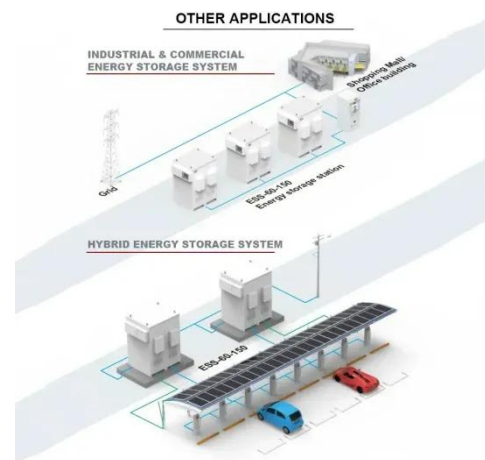
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The thermal energy storage potential of underground tunnels used ...

These are operations characterized by

different charging-discharging profiles, charging-discharging temperature differences, ground saturations, and ground uniformities. ...

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