

Can solar thermal energy be stored underground?

Energy piles, which embed thermal loops into the pile body, have been used as heat exchangers in ground source heat pump systems to replace traditional boreholes. Therefore, it is proposed to store solar thermal energy underground via energy piles.

Can energy piles store solar thermal energy underground?

Ma and Wang proposed using energy piles to store solar thermal energy underground in summer, which can be retrieved later to meet the heat demands in winter, as schematically illustrated in Fig. 1. A mathematical model of the coupled energy pile-solar collector system was developed, and a parametric study was carried out.

How does underground solar energy storage change over time?

Overall, the daily average rate of underground solar energy storage decreases over time due to a gradual heat build-up in the soil. This decline is most notable within the first month. At the very beginning, there is almost no difference between cases in different soils.

Why do we need solar energy storage?

Solar energy provides a potential way to meet the heat demands of buildings. Solar radiation, however, is not constantly available, and thus energy storage needs to be considered to ensure the robustness of the energy supply.

Energy storage needs to account for the intermittence of solar radiation if solar energy is to be used to answer the heat demands of buildings. Energy piles, which embed ...

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