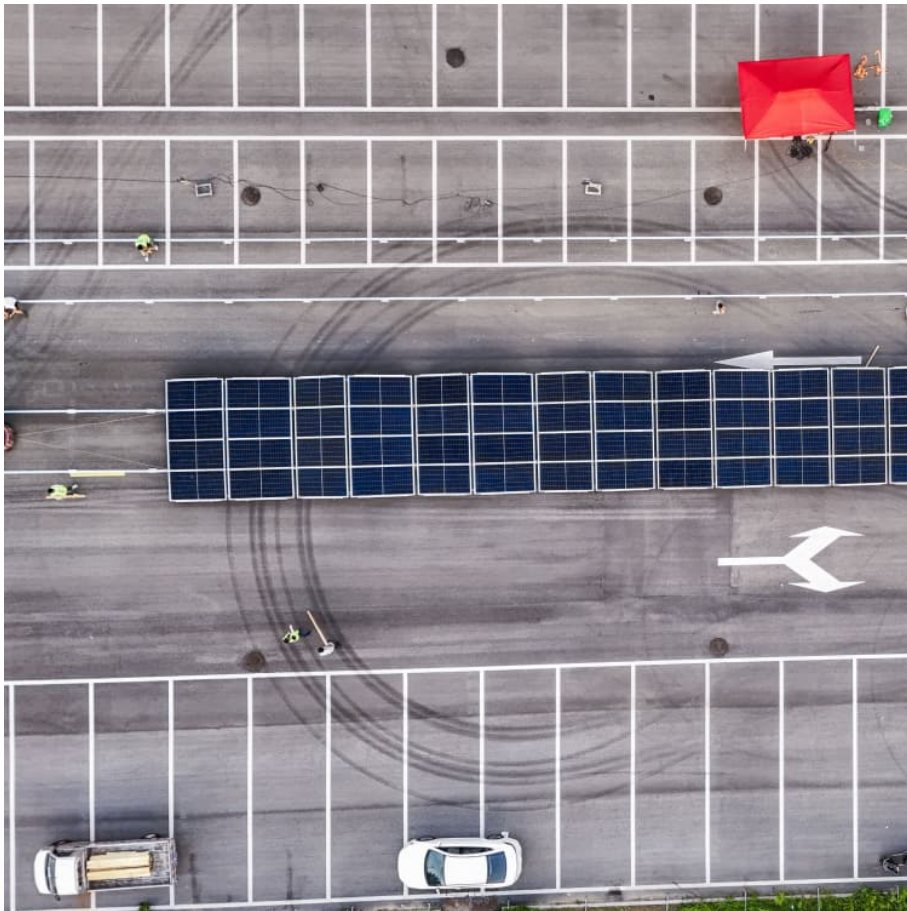


# Spiral pile energy storage





## Overview

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This study presents a field test to investigate the thermal injection performance of a full-scale energy pile for underground solar energy storage (USES). The tested energy comprises a full-scale bridge pile foundation an.



## Spiral pile energy storage

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### **A review on the performance of geothermal energy pile ...**

Additionally, piles with larger diameter greatly influence the heat transfer and storage capabilities of the GEP due to the enhanced pile contact surface area with the ground, ...

### HEAT STORAGE ANALYSIS OF ENERGY PILES WITH SPIRAL...

Energy pile is a cost-effective solution for ground-coupled heat pump systems to take the place of borehole ground heat exchanger partly. This paper focuses on the influence ...



### **Optimizing the restoration performance of pipe energy piles using**

Efficient extraction of geothermal energy is important for achieving energy saving in buildings. The energy extraction capacity of energy piles has been improved by ...



### **Numerical simulation and validation on heat exchange ...**

In this paper, a novel configuration of an energy pile with a spiral coil was proposed. In order to investigate the effects of various factors on heat



exchange performance of the pile spiral coil ...



### [Modeling and Design Aspects of Shallow Geothermal...](#)

The energy piles are finding new implementations, such as using energy piles in snow melting systems for bridge decks [6], co-utilization of solar ...

### **Thermal performance of pipe-type energy piles with open-ended ...**

They reported that the temperature changes in the piles and the soil gradually accumulated with increasing cycle times while the heat exchange capacity gradually ...



### [Study on Thermodynamic Properties of Spiral Tube...](#)

Based on the research status of phase-change material (PCM) energy piles, this paper proposes a new type of PCM energy pile-spiral tube ...



## Modeling of Thermomechanical Energy Pile Behavior with ...

Geothermal energy foundations or thermoactive ground structures present sustainable alternative systems for meeting heating/cooling needs of buildings in different ...

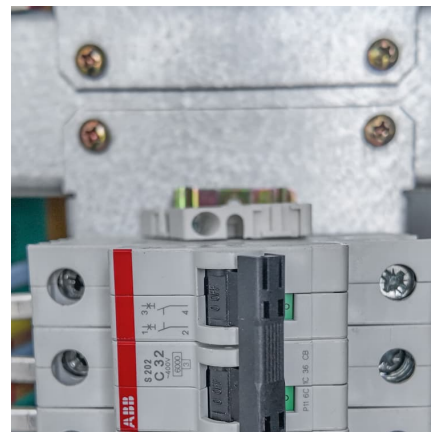


## [Thermo-Mechanical Performance of a Phase Change ...](#)

To reduce the thermal response and improve the heat storage capacity of energy piles, a phase change (PC) energy pile was proposed. This ...

## A New Environmentally Friendly Utilization of Energy Piles into

1. Introduction In the background of the global energy crisis, energy pile is a form of green and sustainable energy utilization, or one of the solutions to energy problems. At ...



## A review on energy piles design, evaluation, and optimization

It is concluded that a multi-objective optimization is highly recommended to enhance the dual performance of an energy pile system coupled with a heat pump using the 4E evaluation ...



### Heat transfer performance of energy pile and borehole heat ...

Zhao et al. [32] indicated that the peak heat transfer rates per unit pile length and unit pipe length of a spiral-tube energy pile were approximately 3.65 times and 1.32 times ...



### Study on Thermodynamic Properties of Spiral Tube-Encapsulated ...

Based on the research status of phase-change material (PCM) energy piles, this paper proposes a new type of PCM energy pile-spiral tube-encapsulated PCM energy pile.



### A critical assessment and summary on the low carbon energy pile

The concrete piles utilized in energy piles boast high thermal conductivity and heat storage capabilities, enhancing heat transfer efficiency between the pile and the ...





### [How Solar Panels Defy 70m/s Winds with Helical](#)

In its original bracket design, solar panels can withstand 55m/s wind speeds. Using helical piles able to further improves their wind resistance, effectively ...

### **A review on energy piles design, evaluation, and optimization**

Abstract Integrating heat exchanger pipes with structural foundations in one system has created a new renewable solution for buildings' thermal loads. However, the interaction between thermal ...



### **Factors Affecting Energy Pile Efficiency , Soil Mechanics and**

Energy pile is a deep foundation that combines two functions, transferring structural loads to the soil and serving buildings thermal needs. It is an innovative technology ...

### **Soil thermal imbalance of ground source heat pump systems with spiral**

The ground source heat pump systems with spiral-coil energy piles are promising for building energy saving in high-density cities. However, when applied in heating ...



### **Simplified Heat Transfer Model for Spiral-Coil Energy Pile ...**

The operation mode of energy pile groups has a significant effect on the thermal interference between energy piles. The thermal interference of energy pile groups in the intermittent ...



### **Thermal performance of heat storage-enhanced PCM energy pipe pile ...**

Abstract Improving heat transfer efficiency while maintaining operational safety is crucial for energy piles. This study proposes a novel energy pipe pile (EPP) enhanced with ...



### **Investigation of microencapsulate phase change material-based energy**

The results reveal the great potential of adding microPCM to facilitate more energy extraction for the energy pile group. However, because the addition of microPCM ...





### Feasibility of ground source heat pump using spiral coil energy piles

In this paper, the system model of GSHP using spiral coil energy piles is set up based on the proposed energy pile group model. A hotel is selected as the objective and ...



### On the thermal performance enhancement of spiral-coil energy piles ...

Energy piles suffer from cold or heat accumulation in and around the pile, degrading their long-term performance. The current study seeks to alleviate this problem by ...

### A New Environmentally Friendly Utilization of Energy ...

1. Introduction In the background of the global energy crisis, energy pile is a form of green and sustainable energy utilization, or one of the ...



### Response of energy pile-soil structure and pile group effect: An ...

Energy pile has dual functions of coupled heat transfer and load-bearing. The research on its bearing characteristics has attracted much attention. This research is based on ...



### Thermo-mechanical coupling performance analysis of phase ...

Compared to traditional energy piles, the novel PCM/NFSEP proposed in this study exhibits stronger heat exchange performance and heat storage capacity, with the following advantages:  
...



### Modeling and Design Aspects of Shallow Geothermal Energy Piles ...

The energy piles are finding new implementations, such as using energy piles in snow melting systems for bridge decks [6], co-utilization of solar and shallow geothermal ...

### [International Heat Transfer Conference 16](#)

Then the heat storage characteristics of an energy pile are investigated in consideration of the thermal diffusion coefficient of grout, the aspect ratio of energy pile, the relative pitch of spiral ...





### **Simulation and Analysis of the Thermal-Mechanical Response of an Energy**

Abstract An energy pile undertakes the functions of supporting the superstructure and controlling the indoor temperature of the building, and the thermal ...

### **The buried depth of the spiral pile of photovoltaic support**

Do energy piles have a high heat transfer and bearing capacity? Author to whom correspondence should be addressed. Energy piles, combined ground source heat pumps (GSHP) with the ...



### **Underground solar energy storage via energy piles: An ...**

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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