Solar inter-seasonal soil heat storage

Overview

The functioning principle of SAGSHP is that of inter-seasonal heat storage where heat collected in summer using a solar thermal collector is stored in the ground to be used by the GSHP during winter. For example.
Abstract—Summer heat is potentially one of the largest energy sources in many countries but to be useful it needs to be stored until the winter, preferably without the need for expensive and inflexible district heating systems. It is proposed that the summer heat can be injected into the ground.
Abstract: Seasonal storage of solar thermal energy or of waste heat from heat and power cogeneration plants will significantly contribute to substitute fossil fuels in future energy systems. This paper proposes a soil heat deficit.

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[Seasonal thermal energy storage]

OverviewSTES technologiesConferences and organizationsUse of STES for small, passively heated buildingsSmall buildings with internal STES water tanksUse of STES in greenhousesAnnualized geo-solarSee also

There are several types of STES technology, covering a range of applications from single small buildings to community district heating networks. Generally, efficiency increases and the specific construction cost decreases with size. UTES (underground thermal energy storage), in which the storage medium may be geological strata ranging from earth or sand to solid bedrock, or aquifers. UTES technologies include:

[Inter-Seasonal Heat Storage]

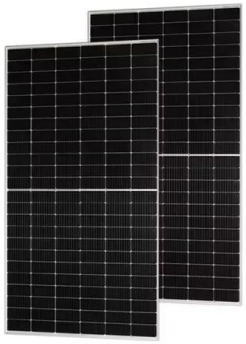
In the summer the heat pump draws heat from the cold isothermal store at night (and/or during the day if solar power is available). The cold isothermal store extracts heat from the house air, providing air ...

[Performance analysis of seasonal soil heat storage system based on]

In this section, the heat transfer of the soil heat storage unit are discussed in detail by analyzing the soil temperature variations in each channel and the heat flow changes of the six heat ...

Seasonal thermal energy storage

Warm-temperature seasonal heat stores can be created using borehole fields to store surplus heat captured in summer to actively raise the temperature of large thermal banks of soil so that heat can ...



Soil Heat Deficit Regulation-Based Cross-Seasonal Heat Storage

This study proposes a novel cross-seasonal heat storage method based on soil heat deficit regulation for the MDBHE, which expands the soil heat deficit to enhance the geothermal heat ...

Seasonal Thermal Energy Storage: A Challenging Application for

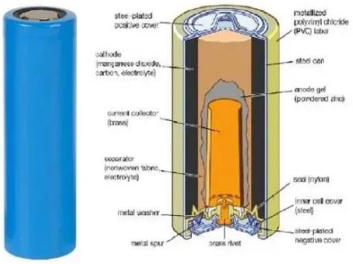
Seasonal storage of solar energy or waste heat from combined heat and power generation (CHP), i.e. with biogas, offers a great potential to substitute fossil fuels in future energy systems.

Simulation and Analysis of Influencing Factors of Solar Energy ...

Therefore, in practical engineering applications, for the solar inter-seasonal soil heat storage system, the parameters of buried pipes, collectors and other components are recommended to be reasonably ...

[Are shallow boreholes a suitable option for inter-seasonal ground ...]

Data regarding the energy fluxes involved in the soil-based thermal store have been monitored and analysed for one year. The results show that the shallow soil is able to serve as a storage medium to ...



[Performance analysis of cross seasonal thermal storage solar soil]

Two renewable energy sources, solar and geothermal energy, are used to form a solar-soil source heat pump system. The performance of the system can be improved [26].

[Performance investigation of a solar-driven cascaded phase change ...]

Utilizing phase change materials with high energy density and stable heat output effectively improves energy storage efficiency. This study integrates cascaded phase change with a

[Simulation and Analysis of Influencing Factors of Solar Energy Inter]

Taking an office building in Jinan as an example, the simulation model of solar inter-seasonal soil heat storage was established by TRNSYS software, and the variation law of ground

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