

## European Solar and Energy Storage Solutions

# Solar inter-seasonal heat storage



## Overview

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Seasonal thermal energy storage (STES), also known as inter-seasonal thermal energy storage, is the storage of heat or cold for periods of up to several months. The thermal energy can be collected whenever it is available and be used whenever needed, such as in the opposing season. For example, heat from solar.

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.

The Energy Conservation through Energy Storage (ECES) Programme has held triennial global energy conferences since 1981. The conferences originally focused exclusively on STES, but now that those technologies are mature.

A number of homes and small apartment buildings have demonstrated combining a large internal water tank for heat storage with roof-mounted solar-thermal collectors. Storage temperatures of 90 °C (194 °F) are sufficient to supply both domestic hot water and space.

Annualized geo-solar (AGS) enables in even cold, foggy north temperate areas. It uses the ground under or around a as to heat and cool the building. After a designed, conductive thermal lag of 6 months the heat is.

Small passively heated buildings typically use the soil adjoining the building as a low-temperature seasonal heat store that in the annual cycle reaches a maximum temperature similar to average annual air temperature, with the temperature drawn down for heating in.

STES is also used extensively for the heating of greenhouses. ATEs is the kind of storage commonly in use for this application. In summer, the greenhouse is cooled with ground water, pumped from the “cold well” in the aquifer. The water is heated in the process.

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### Analysis strategy for multi-criteria optimization: Application to inter

The present work is devoted to the study a solar thermal system combined with an inter-seasonal storage (ISS) for heat needs during the winter and a hot water storage for ...

### IHT , Interseasonal Heat Transfer(TM) , Seasonal Heat Storage

Seasonal Heat Storage integrates the strengths of solar thermal collection in summer with seasonal thermal storage in ThermalBanks - in order to deliver heat through heat pumps more ...



### Analysis strategy for multi-criteria optimization: Application to inter

In the present work, we propose an analysis strategy for multi-criteria optimization applied to inter-seasonal solar heat storage for residential building energy needs, including heating and ...

### Application of graded phase change materials for solar energy inter

Then the mathematical model, boundary conditions and solution parameters of the stepped phase change heat accumulator are set, and the data analysis of the effect of the pool height-to ...



## Coordinated planning and operation of inter seasonal heat storage ...

Combined with the above analysis, a typical inter-seasonal heat storage works as shown in Fig. 2 the non-heating season, the heat load of urban customers is small, while ...

## Seasonal Thermal-Energy Storage: A Critical Review on ...

This review analyzes recent case studies--numerical and field experiments--seen by borehole thermal energy storage (BTES) in space heating and domestic hot water capacities, coupled with solar thermal energy.



## Thermal Banks store solar heat between seasons

A Thermal Bank is a bank of earth used to store solar heat energy collected in the summer for use in winter to heat buildings. between seasons. Alternative descriptions include: Heat Bank, Heat Battery, Heat Store, Heat Vault, ...



## Using surplus PV power for seasonal underground ...

The system was described in "Development and simulated evaluation of inter-seasonal power-to-heat and power-to-cool with underground thermal storage for self-consumption of surplus solar energy"



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