

**Espay Solar Energy S.L.**

# **Danish solar thermal energy storage heating**



## Overview

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The SUNSTORE® concept consists of a large heat storage (pit heat storage, borehole storage or tank storage), solar collectors to heat up the storage, a heat pump to use the storage as heat source (and at the same time extend solar production, reduce heat loss). The SUNSTORE® concept consists of a large heat storage (pit heat storage, borehole storage or tank storage), solar collectors to heat up the storage, a heat pump to use the storage as heat source (and at the same time extend solar production, reduce heat loss). With solar thermal plants providing the energy, production at the district heating plant is fossil free. In Denmark the need for electricity is bigger in the winter where the hours of sunshine are limited. Therefore, storing the energy from summer to winter is the next step towards a more flexible. The small Danish town of Vojens, home to 7,480 people and known for its less sunny climate, hosts the world's largest seasonal solar heat storage project in operation since 2016. In the last four years, more and more Danish district plants have been equipped with large heat storages in the form of water pits with the aim to increase flexibility and stability of the energy. District energy is one of the main technologies in transition of existing buildings in cities to be heated and cooled without using fossil fuels. By storing excess thermal energy generated from various sources, TES helps balance energy supply and demand, enhances system efficiency, and contributes to the reduction of greenhouse gas. But Danish solar thermal energy storage is quietly rewriting the rulebook on how we harness sunlight for heat.

## Danish solar thermal energy storage heating

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### Innovations in the front-running solar district heating ...

The Danish solar district heating sector is a role model for the world. Researchers from IEA SHC visited two innovative solar district heating examples there.

### LONG TERM STORAGE AND SOLAR DISTRICT HEATING

In Den-mark the need for electricity is bigger in the winter where the hours of sunshine are limited. Therefore, storing the energy from summer to winter is the next step towards a more flexible ...



### Danish Solar Thermal Energy Storage: Heating the Future, One ...

But Danish solar thermal energy storage is quietly rewriting the rulebook on how we harness sunlight for heat. Imagine a world where summer sunshine heats your shower in December ...

### Technology Brief New chapter on Long term energy storage in the

Ongoing work is focused on improving materials like liners for PTES, expanding the use of ATES in district heating, and improving modeling techniques for more accurate system planning and integration.



### **Thermal Energy Storage for District Heating**

Integrating thermal energy storage with solar heating systems allows for the efficient use of solar energy, which is abundant in the summer but scarce in the winter.

### **Solar district heating with the largest pit thermal storage globally**

The small Danish town of Vojens, home to 7,480 people and known for its less sunny climate, hosts the world's largest seasonal solar heat storage project in operation since 2016.



### **Sustainable district heating through solar heating plants and thermal**

The combination of a large seasonal storage tank and a heat pump enables 40-50 percent of the annual heat

demand to be met by solar thermal energy. It has also reduced CO2 ...



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## Large-scale solar district heating plants in Danish smart thermal grid

Potential trend of solar district heating plants in Denmark was discussed. Large solar collector fields are very popular in district heating system in Denmark, even though the solar ...



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## Design and Construction of Large Scale Heat Storages for District

This publication focuses on sensible seasonal heat storages, especially borehole thermal energy storages (BTES) and pit thermal energy storages (PTES) in applications with solar thermal systems.

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## Large Scale Heat Storages for Solar District Heating

Denmark is the international frontrunner on large scale application of renewable

energy systems. In the last four years, more and more Danish district plants have been equipped with large heat storages in ...



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