

Copenhagen thermal energy storage





Overview

Denmark is also heavily invested in wind turbines and thermal storage facilities that give consumers access to cheap power during periods of high demand. Since 2010, Copenhagen has used seawater to create a district cooling system and the network is still expanding.

Denmark is also heavily invested in wind turbines and thermal storage facilities that give consumers access to cheap power during periods of high demand. Since 2010, Copenhagen has used seawater to create a district cooling system and the network is still expanding.

Thermal Energy Storage (TES) is a pivotal technology in advancing sustainable district heating systems. 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.

Copenhagen's district heating relies largely on biomass and waste incineration power plants, but net-zero carbon targets are now encouraging suppliers to harness energy from renewables and industrial by-products. Alex Smith reports Two new landmark power plants make a striking addition to.

Thermal heat storage is the least costly way to store energy and enables the heating sector to be climate neutral and more efficient. To maximize the benefits of pit thermal energy storage (PTES), water here reaches 90°C. To improve function, the inside and cover surface is lined with Agru's PP-HTR.

VEKS (municipality-owned heat transmission company) and HTF (consumer-owned heat distribution company) have implemented a Pit Thermal Energy Storage (PTES) in Høje Taastrup to provide flexibility to the electricity production system and the heat production system in Copenhagen. The project was.

The purpose of the trip was to visit an innovative pit thermal energy storage (PTES) system, which is currently unique in the context of large-scale district heating systems in Denmark. The storage unit has a volume of 70,000 m³, a charging and discharging capacity of 30 MW, and a thermal storage.



Høje Taastrup Fjernvarme a.m.b.a. (district heating company (HTF)) and the district heating trans-mission company VEKS are currently establishing a Pit Thermal Energy Storage (PTES) in Høje Taastrup near Copenhagen. By Lars Gullev, CEO at VEKS The PTES will optimize the total district heating (DH).
What is thermal energy storage?

Similar to storing any other product, thermal energy storage separates the time of production from the time of consumption. This means that heat can be stored when it is generated from sources such as Combined Heat and Power (CHP) plants, solar collectors, surplus wind electricity, and industrial processes.

What are the benefits of thermal energy storage?

“Thermal energy storage offers numerous benefits, including improved economic performance and increased flexibility in district heating systems. Decoupling production from consumption enables the integration of more sustainable heat sources.” A unique feature of district heating is the ability to store hot water both on a daily and seasonal basis.

What is short-term thermal energy storage?

Short-term thermal energy storage is a critical component of Danish district heating networks. Its primary purpose is to decouple power production at CHP plants, allowing these plants to optimize their cogeneration of electricity and heat according to fluctuating electricity market prices without compromising the heating supply.

Does Copenhagen use seawater to create a district cooling system?

Since 2010, Copenhagen has used seawater to create a district cooling system and the network is still expanding. There is also a drive to replace the fossil fuels used in peak and reserve load boilers in district heating with biofuel, electric boilers and biogas (see panel, ‘Energy sources in Copenhagen’).

Does Copenhagen have a hot water transmission system?

There is now a 180km hot-water transmission system¹ in Greater Copenhagen, operated by CTR, VEKS and Vestforbrænding, which runs a large CHP waste incinerator. Owned by local authorities, they supply heat from waste incinerators and CHP plants to 21 distribution networks.



Copenhagen thermal energy storage

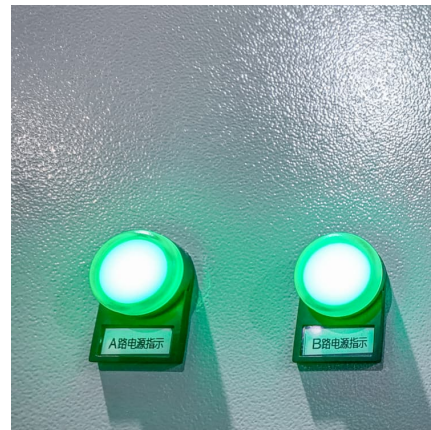


Something is sustainable in the state of Denmark: A review of the

Various short-term and long-term thermal energy storage solutions enable heat storage in the district heating systems, and this facilitates the integration of locally available ...

Optimizing District Heating Through Pit Thermal Energy ...

Optimizing District Heating Through Pit Thermal Energy Storage In Denmark Copenhagen-area heating companies Høje-Taastrup District Heating and VEKS are tasked with providing ...



Long Duration Energy Storage Council Annual Member Meeting ...

Ensuring reliable electricity supplies while maintaining affordability for consumers and businesses presents a dual challenge; long duration energy storage (LDES) ...

Three years after cracking cheap solar storage, Hyme plans the ...

The Danish startup Hyme Energy, which has developed a way to store renewable energy using molten salt, is teaming up with dairy



producer Arla to create the ...



[how much does thermal energy storage cost in copenhagen](#)

Energy plans in practice: The making of thermal energy storage in urban Denmark Much of the academic literature that investigates energy planning focuses on the development of plans but ...

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[Copenhagen thermal energy storage production](#)

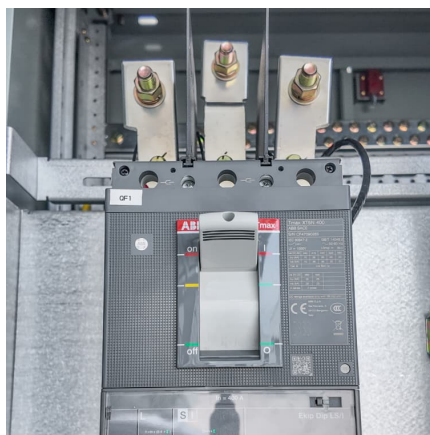
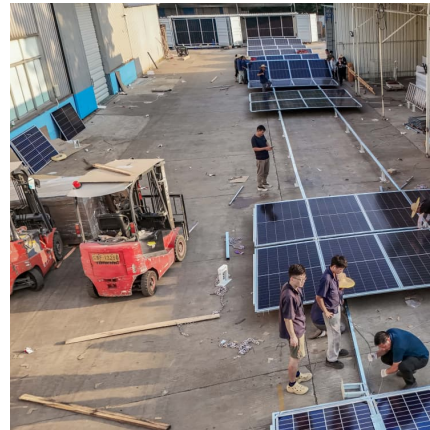
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Design and Construction of the Pit Thermal Energy Storage ...

"Heat Plan Greater Copenhagen 3 demonstrates a large economic potential for investing in heat storage in the metropolitan area. The next step is to find suitable locations for the ...



Monitoring data of the Høje Taastrup water pit thermal energy storage

The pit thermal energy storage (PTES) in Høje Taastrup, Denmark, was the first large-scale PTES to be operated as a short-term storage (storage cycle of 1-2 weeks). The ...

Monitoring data of the Høje Taastrup water pit thermal ...

1. Value of the Data o This dataset provides detailed insights into the operation and performance of the first large short-term pit thermal energy storage (PTES) system. The data allows for ...



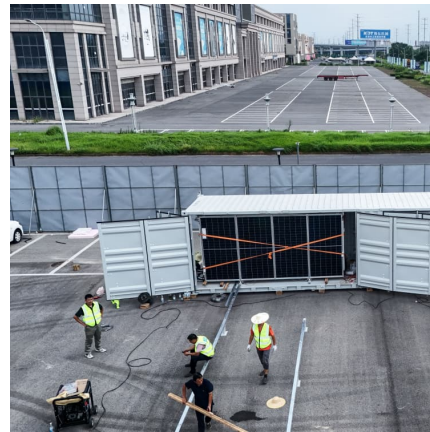
International Conference on Smart Energy Systems and 4th ...

PTES, Pit Thermal Energy Storage Low cost storing energy in a green future A flexible energy system that will enable the conversion from conventional fossil fuel energy to fluctuating ...



Monitoring Results from Large Scale Heat storages for ...

Since the 80'ties large-scale thermal energy storages have been developed and tested in the Danish energy system. From 2011 five full-scale pit thermal energy storages and one pilot ...



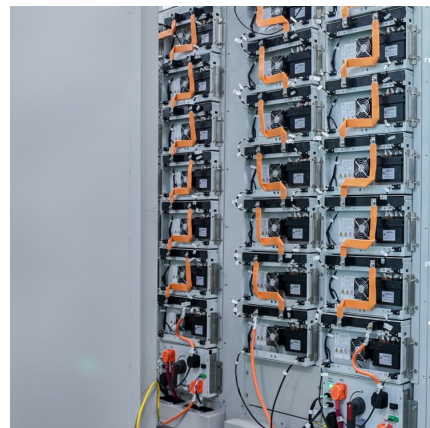
Energy plans in practice: The making of thermal energy storage in urban

Much of the academic literature that investigates energy planning focuses on the development of plans but overlooks how they shape actors' situated sensemaking in the field. ...



[Top 15 Green Energy startups in Denmark \(September 2025\)](#)

Hyme is maturing a grid-scale thermal energy storage solution based on molten salts to greatly improve the integration of sustainable energy in the energy system.





Battery Energy Storage Systems (BESS)

Currently, there are seven Battery Energy Storage System (BESS) projects in various stages of development in the UK, with the first Final Investment Decision (FID) expected in the second ...

ENERGY STORAGE

Literature with regards to LHTES (Latent Heat Thermal Energy Storage) deals with research and development of heat storing potential of PCM, application for energy storage purposes and ...



[Copenhagen solar thermal storage manufacturer](#)

Hyme is deploying a large-scale thermal energy storage solution that stores electricity from renewables as heat in molten salts. Molten salts have been used in the concentrated solar ...

Copenhagen New Energy Storage: Where Vikings Meet Voltages

When a 2022 cold snap froze wind turbines, the city's thermal storage facilities saved the day by releasing heat from summer-stored excess energy. Talk about a seasonal plot twist!



[Thermal Energy Storage in Greater Copenhagen](#)

Project title: Thermal Energy Storage in Greater Copenhagen: A study of the role of calculative devices and social perceptions in facilitating the implementation of thermal energy storage in ...

[Demonstration of pit thermal energy storage](#)

The storage is demonstrated in Høje Taastrup Fjernvarme's distribution system, but connected to the large VEKS transmission system as part of the integrated District Heating system in ...



Optimizing District Heating Through Pit Thermal Energy ...

This new pit storage optimizes the operation of the whole district heating network in Copenhagen, creating value for both the heat producers and consumers, who all benefit from the green ...

Monitoring data of the Høje Taastrup water pit thermal energy ...

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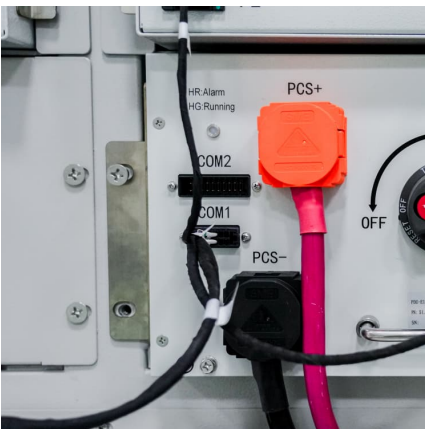
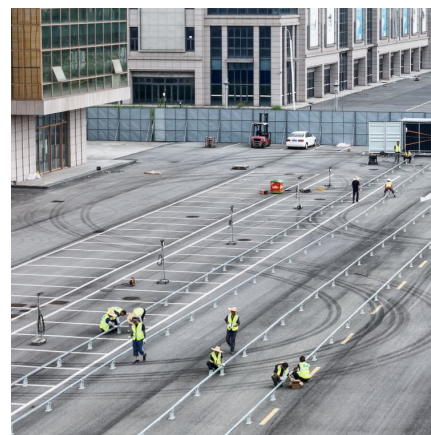


[copenhagen thermal energy storage production plant](#)

A new pit thermal energy storage is now in operation in Høje Taastrup contributing to the heat supply of Copenhagen, Denmark. This 70.000 m³ storage is the first of its type in operation in ...

[Copenhagen energy storage technology](#)

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[Danish district heating - The heat of the moment](#)

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