

What is thermal energy storage?

Thermal energy storage is a broad field of research in the context of renewable energy technologies. Today, two-tank molten salt storage is commonly used, but there are other more cost-efficient storage options being developed.

What is the future of the Swedish energy system?

Table 1. Summary of literature review. In case of the Swedish energy system, there are uncertainties surrounding the future of nuclear power plants, the anticipated increase in wind and solar PV installations, electrification trends, and the role of hydrogen in the steel industry [34, 35].

Should we study the Swedish energy system at national scale?

Hitherto studies have predominantly focused on electricity sector. Nevertheless, the targets for 2045 necessitates studying the Swedish energy system at national scale in the context of sector coupling & storage.

What energy sources does Sweden use?

Sweden has a diverse mix of energy sources. Domestically, it relies on hydropower, wind, and biomass. However, it imports fossil fuels like oil, natural gas, nuclear fuels, and a portion of biofuels from other countries. Fig. 1 illustrates the composition of different energy sources in the supply mix. Fig. 1.

Why do we need cold storage in Sweden?

To lower the installation costs of a DC system yet still to cover the peak cooling demands, cold storage is sought for. Despite experiencing a northern climate, Sweden also has a considerable cooling demand throughout the year, particularly from industrial, service and commercial sectors.

Are hybrid energy storage systems enabling greater flexibility in energy communities?

Hybrid energy storage systems (HESS) are responding to the evolving nature of energy systems and have the potential of enabling greater flexibility in energy communities (EC). Understanding and leveraging EC members' energy-related behaviors, preferences, and constraints can enhance this potential.

Emerging advanced thermal storage solutions offer a variety of benefits, such as higher energy densities at lower temperatures and longer storage periods. However, their complex heat ...

Abstract As mitigating climate change becomes an increasing worldwide focus, it is vital to explore a diverse range of technologies for reducing emissions. Heating and cooling ...

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

Swedish thermal power storage concept

The present work deals with the initial design and performance evaluation of a novel thermal energy storage concept consisting of a packed bed of rocks with a radial gas flow, suitable for ...

The analysis examines the role of storage in utilizing excess electricity production, total fuel supply, and system costs under power-to-heat (PtH) and power-to-hydrogen (PtH 2) ...

This paper identifies the path-dependent evolution of the Swedish and Danish energy systems that influenced the TES technologies that each developed. Opportunities for TES technology ...

This is shown in the second part, where storage solutions for conventional and solar thermal power plants are described. Systems using thermal energy storage for facility scale storage of ...

In recent years, several district heating companies in Sweden have chosen to construct thermal energy storages as means to make heat and power production more resilient and sustainable ...

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