

## Solar Energy South Africa

# Sand battery Finland



- |   |                           |    |                           |
|---|---------------------------|----|---------------------------|
| 1 | PCS Module                | 6  | OPV2 side circuit breaker |
| 2 | Battery room              | 7  | High Volt Box             |
| 3 | Grid side circuit breaker | 8  | BAT side circuit breaker  |
| 4 | Load side circuit breaker | 9  | LCD display screen        |
| 5 | OPV1 side circuit breaker | 10 | MPPT                      |



## Overview

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What is a sand battery?

The Sand Battery efficiently stores large amounts of intermittent energy for extended periods and returns it as highly valuable heat when needed. Polar Night Energy's Sand Battery is a large-scale, high-temperature thermal energy storage system that uses sustainably sourced sand, sand-like materials, or industrial by-products as its storage medium.

What is the world's first sand battery?

Finnish companies Polar Night Energy and Vatajankoski have built the world's first operational "sand battery", which provides a low-cost and low-emissions way to store renewable energy.

What is the world's biggest sand battery?

The industrial-scale storage unit in Pornainen, southern Finland, will be the world's biggest sand battery when it comes online within a year. Capable of storing 100 MWh of thermal energy from solar and wind sources, it will enable residents to eliminate oil from their district heating network, helping to cut emissions by nearly 70 per cent.

How much sand does a kankaanpää'sand battery' hold?

The Kankaanpää "sand battery" holds 100 tonnes of hot sand "Solar and wind power is basically already really competitive in terms of energy price per produced energy unit," Polar Night Energy co-founder and chief technology officer Markku Ylönen told Dezeen. "The only problem with them is that you can't really choose when it's produced."

What is vatajankoski sand battery technology?

Vatajankoski has gained global attention by utilizing sand battery technology as the world's first new energy company in Kankaanpää. A French television channel TF1 visited Finland to learn about sand batteries in the fall of 2022.

The heating power of the thermal storage, implemented as a pilot project, is 100 kW and the storage capacity is 8 MWh.

How does sand become a battery?

The sand becomes a battery after it is heated up to 600C using electricity generated by wind turbines and solar panels in Finland, brought by Vatajankoski, the owners of the power plant. The renewable energy powers a resistance heater which heats up the air inside the sand.

## Sand battery Finland

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### What Is a Sand Battery?

The World's First Sand Battery in Finland. Polar Night Energy developed and operates the world's first commercial Sand Battery in Kankaanpää, Finland, for the energy utility Vatajankoski. This 200 kW Sand Battery, with an 8 MWh capacity, is a 7-meter tall structure with a diameter of around 4 meters. It uses 100 tons of locally sourced

### Sand Battery

Vatajankoski and Polar Night Energy have built a sand battery in Kankaanpää, the world's first commercial solution to store electricity as heat for district heating. The sand battery can reduce emissions, energy costs and risks for industrial ...



### Startup is building a giant sand battery in Finland

Going commercial: In 2022, Polar began operating the world's first commercial sand battery in the Finnish town of Kankaanpää. It holds about 100 tons of sand, heated to 1112 F (600 C). That equates to 8 MWh of thermal energy -- enough to provide heat and hot water to more than 100 homes through the town's district heating system.. Polar has now announced ...

### A Tiny Town Is Betting on a

## Sand Battery to Heat Homes. It Could

Finland is doing sand batteries big. Polar Night Energy already showed off an early commercialized version of a sand battery in Kankaanpää in 2022, but a new sand battery 10 times that size is

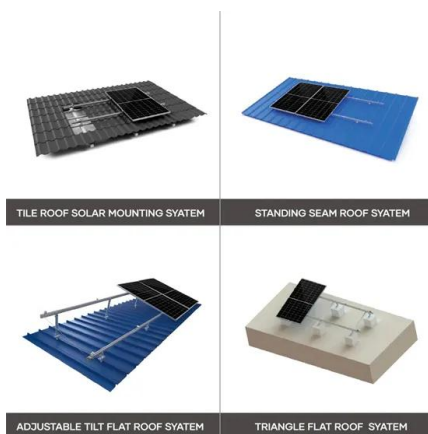


## Finnish "sand battery" offers solution for renewable energy storage

Finnish companies Polar Night Energy and Vatajankoski have built the world's first operational "sand battery", providing a low-cost and low-emissions way to store renewable energy.

## The world's first operational 'sand battery' can store ...

The first commercial solar battery. Working with a small power plant in the town of Kankaanpää in western Finland, Polar Night Energy has erected the first sand battery on a commercial scale

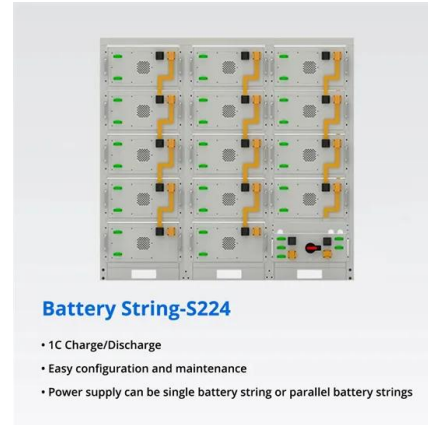


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The First Commercial Sand-based Thermal Energy Storage in the World Is in Operation - BBC News Visited Polar Night Energy -- Polar Night Energy World's first commercial sand battery begins

## Testing to start on 100 MWh sand-based thermal battery in Finland

Finnish startup Polar Night Energy is building an industrial-scale thermal energy storage system in southern Finland. The 100-hour, sand-based storage system will use crushed soapstone, a by



## Testing to start on 100 MWh sand-based thermal battery in Finland

Finnish startup Polar Night Energy is building an industrial-scale thermal energy storage system in southern Finland. The 100-hour, sand-based storage system will use crushed soapstone, a by-product from a fireplace manufacturer, as its storage medium. "The Sand Battery will significantly reduce the combustion-based energy used in our

## Sand Batteries provide heat to district heating ...

The company from Finland promotes its storage system under the brand name Sand Battery, as the vessel is filled with sand. The first commercial Sand Battery with 8 MWh has operated as part of the district ...



## Sand Batteries provide heat to district heating networks in Finland

The company from Finland promotes its storage system under the brand name Sand Battery, as the vessel is filled with sand. The first



commercial Sand Battery with 8 MWh has operated as part of the district heating grid of the utility company Vatajankoski in the town of Kankaanpää, Western Finland, since July 2022 (see photo). The steel

## Polar Night Energy to build 1 MW sand-based heat storage battery in Finland

Finnish startup Polar Night Energy is teaming up with a district heating company to construct an industrial-scale thermal energy storage system in southern Finland. The sand-based system will use



 LFP 48V 100Ah

## Finland's 100MW sand battery turns 2,000 tons of fireplace waste ...

This sustainable energy storage solution is being constructed in Pornainen, southern Finland. This sand battery is a thermal energy storage system that utilizes a unique material: crushed soapstone. What makes this project even more special is its commitment to circular economy. The soapstone, a by-product of Tulikivi's fireplace production, is

## How sand batteries could change the rules of the energy storage ...

4 ???· How can the world's first commercial sand battery installed in Finland be a game changer in

green energy storage? Find out about it in today's video! The advancement of "green" energy, in



## Harnessing Heat: Finland's Innovative Sand Battery

In a bid to combat the challenges of cold polar winters, Finland is set to introduce an industrial-scale 'sand battery' boasting impressive power and thermal energy capacities. Developed by Polar Night Energy, this groundbreaking technology promises to revolutionize energy storage and utilization in the region.

## Finland's Sand Battery Heats a Small Town

Finland's sand battery could be the solution to the heating problem and provide a more flexible way of using and storing heat that "would help a lot in terms of expense" while contributing to Finland's transition toward more renewable sources of gas and electricity. - Marcela Agreda L. Photo: Flickr.



## Finnish "sand battery" offers solution for renewable energy storage

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