

## ContainerPower Energy Solutions

# Wind power cooling and energy storage requirements for communication base stations



## Overview

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Are data centres and telecommunication base stations energy-saving?

Data centres (DCs) and telecommunication base stations (TBSs) are energy intensive with ~40% of the energy consumption for cooling. Here, we provide a comprehensive review on recent research on energy-saving technologies for cooling DCs and TBSs, covering free-cooling, liquid-cooling, two-phase cooling and thermal energy storage based cooling.

Does a dc Server need continuous cooling?

For large servers and computing and storage devices suitable for DCs, continuous cooling is needed, according to Table 2, to maintain DC electronics under a low temperature range of 15–32 °C.

What are the different phase change cooling technologies in data centres?

Yuan et al. reviewed the technical principles, advantages, and limitations of four major phase change cooling technologies in data centres, namely, stand-alone heat pipe cooling, integrated heat pipe cooling, two-phase immersion cooling and phase change cold energy storage.

Can energy-saving cooling technologies be applied to DCS & TBSS?

Energy-saving cooling technologies, as environmentally friendly and low-cost cooling solution, have been developed low-carbon, energy-efficient and achieving sustainability (Cho et al., 2017). Such cooling technologies could be applied to DCs and TBSs since their servers and racks have similar layouts.

Can a water cooling system use chilled water as a storage medium?

Schematic diagram of a hybrid cooling system using chilled water as the storage medium (Chen et al., 2019a). Ling et al. proposed a water cooling system with a TES tank as shown in Fig. 17. When the water temperature was below 12 °C, the nearby lake water was used as the natural cooling source.

Do natural cooling sources increase the coefficient of performance of TBS?

They also showed an increase of the annual coefficient of performance (COP) of the TBSs by 23.7% with the ESR reaching 19.2% with the full utilization of natural cooling sources (Dong et al., 2017). Fig. 8. Schematic diagram of a water-side indirect free cooling system in the bypass of the chiller (Nadjahi et al., 2018). 3.2. Liquid cooling

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