

Can liquid CO₂ energy storage be used as a combined cooling system?

Therefore, this study proposes a novel combined cooling, heating, and power system based on liquid CO₂ energy storage. Using direct refrigeration with a phase change, the system has a large cooling capacity and can achieve a wide range of cooling-to-power ratios through the mass flow regulation of the refrigeration branch.

Is indirect liquid cooling a viable solution for cabinet power density reduction?

Indirect liquid cooling is currently the main cooling method for the cabinet power density of 20 to 50 kW per cabinet. An integrated energy storage batteries (ESB) and waste heat-driven cooling/power generation system was proposed in this study for energy saving and operating cost reduction.

Can a direct refrigeration system achieve a large cooling-to-power ratio?

Using direct refrigeration with a phase change, the system has a large cooling capacity and can achieve a wide range of cooling-to-power ratios through the mass flow regulation of the refrigeration branch. Energy, exergy, and economic analyses were conducted based on models of the proposed system.

What is the total energy consumption of a liquid cooling data center?

The total energy consumption includes the energy consumptions of the cabinets, uninterruptible power supply (UPS), cooling system, lighting system, power transfer, and distribution system. The PUE of the liquid cooling data centers can usually be reduced to below 1.3 [6, 7].

Can a liquid cooling data center drive adsorption refrigeration cycle?

Waste heat from a liquid cooling data center was utilized to drive an adsorption refrigeration cycle in Ref. [1], and the generated refrigeration capacity of the ARC was further used for air cooling. It was found that for a 350 kW water cooling system and a 50 kW air cooling system, the discounted payback period (DPB) was as low as 285 days.

Can a liquid CO₂ energy storage system reduce heat transfer loss?

5. Conclusions A novel liquid CO₂ energy storage-based combined cooling, heating and power system was proposed in this study to resolve the large heat-transfer loss and system cost associated with indirect refrigeration and low cooling capacity without phase change for direct refrigeration.

In a recent issue of Energy & Environmental Science, Wang et al. [1] have made a case for an endothermic solvation reaction-based cooling process as an alternative thermally driven cooling solution, particularly relevant for off-grid communities with low purchasing power. Heat-absorbing reactions between specific salts and water are the basis of commercially ...

Lee and Chen [1] used a dynamic building energy simulation program to examine the potential energy saving

