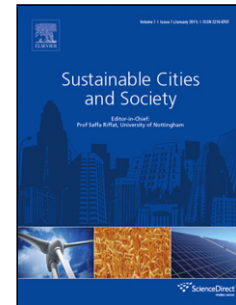


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Authors: Xiaolin Wang, Mike Dennis

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A comparison of battery and phase change coolth storage in a PV cooling system under different climates

Xiaolin Wang, Mike Dennis

Research School of Engineering, the Australian National University, Canberra 0200, Australia

Corresponding author: Xiaolin Wang, xiaolin.wang@anu.edu.au

Highlights

1. A coolth storage component was modelled with CO₂ gas hydrate as the PCM.
2. The energy savings of coolth storage and battery in a PV cooling system were compared.
3. The influencing factors on the charge and discharge of energy storage were analysed.
4. The performance of PV-battery was found better than that of PV-coolth storage cooling system.

Abstract: Energy storage in PV cooling systems is desirable to supply on-site loads during solar outages. Current storage methods of such systems typically use battery storage to store surplus electricity generated by solar panels or coolth thermal energy storage (CTES) to store excess cooling capacity produced by an electric-driven chiller. This study compares three cooling system configurations – no energy storage, with a battery storage, and with a phase change CTES, for a residential building under the climate of Shanghai, Madrid and Brisbane.

Corresponding author: Xiaolin Wang, xiaolin.wang@anu.edu.au

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