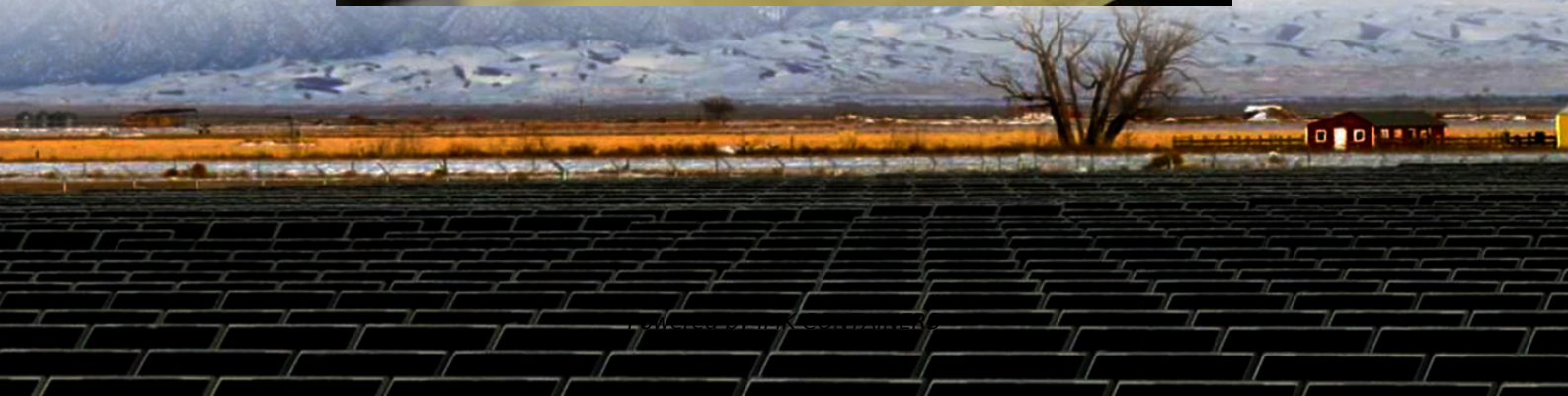


Solar container communication station hybrid energy internal circulation heat dissipation principle





Overview

Does closed-loop matter circulation sustain electricity generation by hydrovoltaic effect?

This sustains electricity generation by hydrovoltaic effect. More importantly, we demonstrate that the ubiquitous and perpetual temperature fluctuations, which are commonly considered detrimental or neglected during energy harvesting, allow stable and sustainable power generation through closed-loop matter circulation.

What is the water transport mechanism inside a HHC?

In the following, an internal circulation model is developed to reveal the water transport mechanism inside the HHC, which includes wicking flow in the bilayer, evaporation from the tissue 45, 46, 47, moisture transport, and condensation (Fig. S11).

Does solar irradiation enhance evaporation and electricity generation?

The mechanism for solar irradiation enhanced evaporation and electricity generation. Nano Energy 101, 107605 (2022). Zhang, Y. et al. Sustainable power generation for at least one month from ambient humidity using unique nanofluidic diode. Nat. Commun. 13, 3484 (2022).

How does a hydrovoltaic bilayer work?

Assisted by these capillary behaviors, hydrovoltaic effect occurs when water flows on the charged surfaces of the bilayer and converts ambient heat into electricity. The HHC can achieve stable output for 160 h, and will not be affected by external factors such as ambient light, temperature, and wind.



Solar container communication station hybrid energy internal circuit



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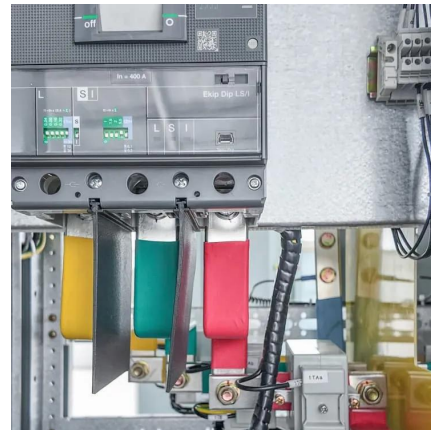
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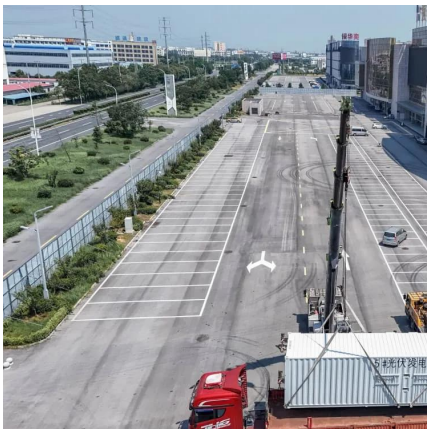
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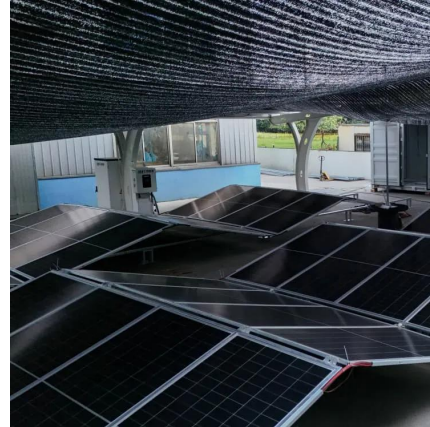
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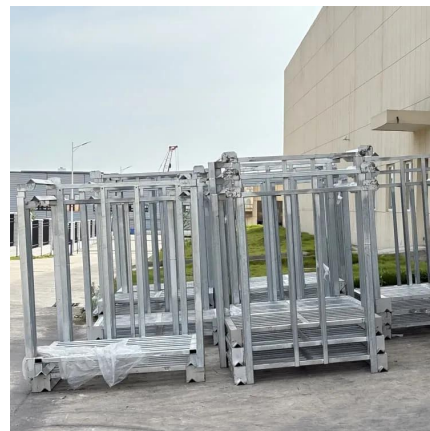
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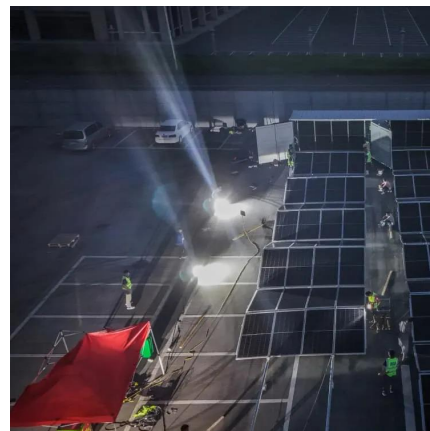
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