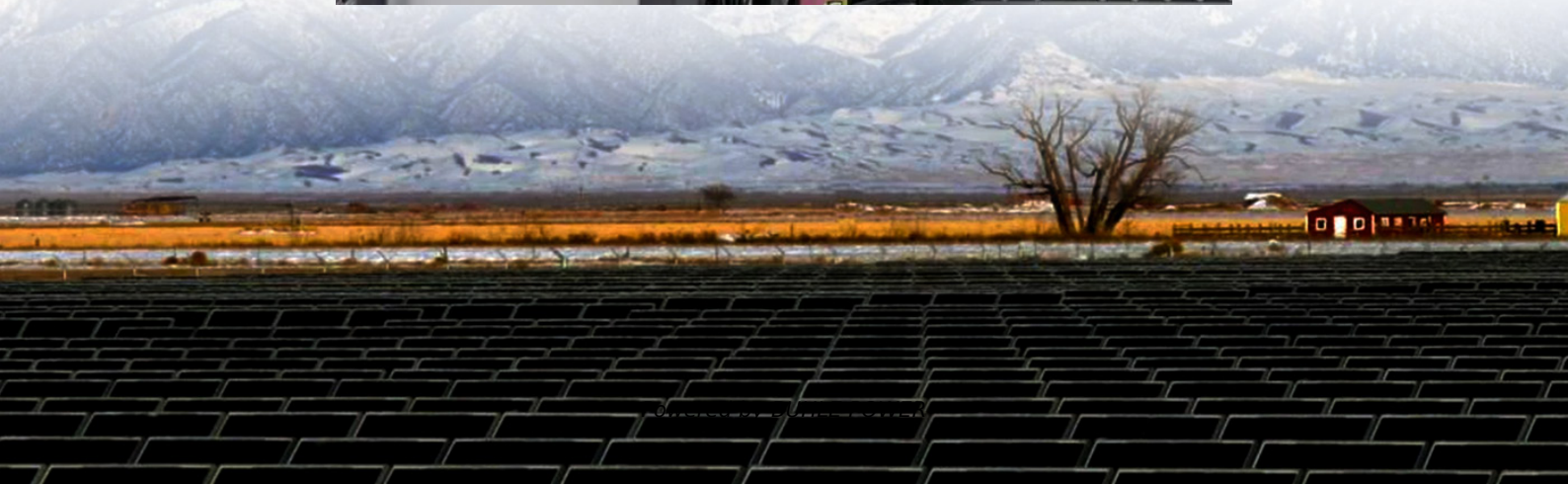
BUHLE POWER

Distributed power generation for global solar container communication stations



Overview

Can distributed photovoltaic systems optimize energy management in 5G base stations?

This paper explores the integration of distributed photovoltaic (PV) systems and energy storage solutions to optimize energy management in 5G base stations. By utilizing IoT characteristics, we propose a dual-layer modeling algorithm that maximizes carbon efficiency and return on investment while ensuring service quality.

How do base stations allocate energy resources?

Regarding resource allocation strategies, traditional methods have primarily focused on traffic and quality of service, treating energy supply as a continuous and stable resource. However, as base stations begin to leverage distributed solar power generation, this energy supply becomes constrained both temporally and spatially.

Can a bi-level model optimize photovoltaic capacity and battery storage capacity?

Energy efficiency and cost-effectiveness are two core considerations in the design and planning of modern communication networks. This research proposes a bi-level model algorithm (see Fig. 1) to optimize the photovoltaic capacity and battery storage capacity of hybrid energy supply base stations.

Where did solar radiation data come from?

The solar radiation data used in this study was specifically obtained from Wuhan, Hubei Province, China. Simulations were conducted under various weather conditions and across different seasons to reflect the regional variations in sunny and non-sunny days.

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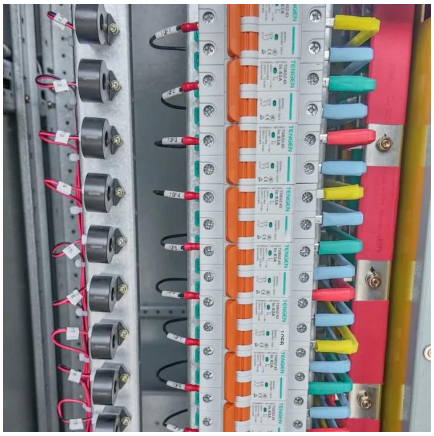

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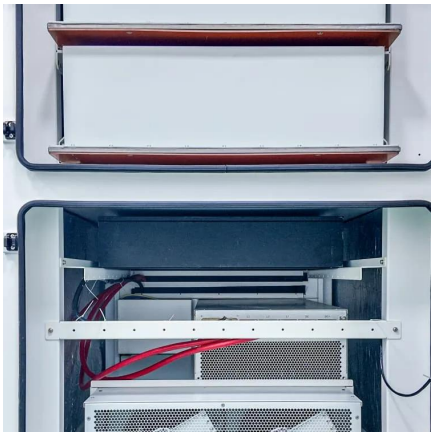

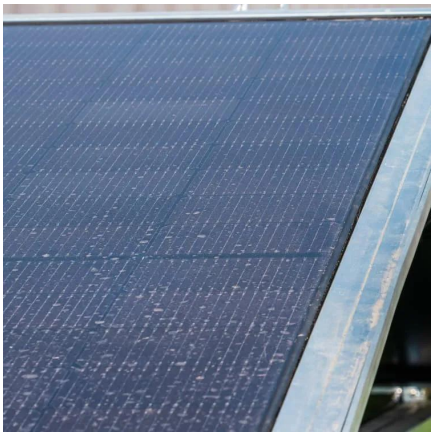

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