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Fast charging of Paris photovoltaic folding containers for drone stations

Overview

The future of urban drone-based transportation and delivery depends upon the efficient operation of its charging infrastructure. Working against gravity draws substantial energy from the drone’s battery, requi.

How to charge a drone based on a solar panel?

Initially, it is possible to see the acquisition and provision of electrical power for the base (energy block), comprising a solar panel, charge controller, and battery bank. The controller’s role is to regulate battery charging and prioritize the power source. In the absence of sunlight, the drone can be charged using the battery bank.

Are UAVs a good choice for Island photovoltaic charging stations?

Dang et al. (2021) propose a multi-criteria decision-making framework for island photovoltaic charging station site selection. While literature is abundant on ground vehicles and ships, UAVs have had less share of this focus. Compared to ground vehicles, the average UAV range is 3 km, which is significantly lower.

Can building-integrated photovoltaics and UAV recharging stations reduce energy consumption?

Upgrading these building envelopes by deploying building-integrated photovoltaics (BIPV) and allocating UAV recharging stations on their roofs would represent a dual green solution. The environmental benefits of reducing energy consumption in upgraded buildings are coupled with generating clean electricity required for the UAV charging functions.

Are UAVs fully charged when they leave the charging station?

UAVs are assumed fully charged when they leave the charging station (SoC=100%). The UAV's flight range is estimated according to the UAV 3D minimal energy trajectory model. As the energy consumption rate varies for loaded and unloaded UAVs, two different flight scenarios are implemented.

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