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# Automatic Payment Method for Off-Grid Solar Containerized Drone Stations

What is "off-grid optimized" recharging?

The second strategy is 'off-grid optimized', which demonstrates the extent to which the number of charging stations can be reduced by delaying the en-route recharging per UAV to the extent possible (maximum  $>20\%$  SoC) to combine more recharging sessions per station as compared to requiring extra charging stations.

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.

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.

Why should autonomous systems be independent from the charging grid?

Furthermore, independence from the charging grid adds extra robustness to the entire autonomous operating system in case of power grid overloads or failure. The authors are unaware of existing studies considering this specific correlative multi-objective approach. In conclusion, from the literature, several important messages are highlighted:

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Unmanned aerial vehicle (UAV) cluster is increasingly used in the field of logistics. However, the efficiency of drone delivery is greatly affected by the limited cruising range. ...

The proposed solutions include laser beam systems which deliver the energy directly to the drones [2], systems that collect solar energy to support drone's long endurance ...

These stations feature solar panels that convert sunlight into electricity, which is then used to charge the drone's batteries. Solar-powered charging docks are eco-friendly and sustainable, ...

The aim is to support continuous drone missions for combating harmful Fall Armyworm (FAW) insects without resorting to chemical methods. This paper presents an ...

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The envisioned outcome is a network of such stations, strategically positioned to enable drones worldwide to conveniently recharge, thus ensuring uninterrupted mission ...

The optimization strategy ensures full coverage regardless of the simulated O-D trips, any UAV trip from one end of the case study area crossing to the other end can 'hop' ...

On-Grid / Off-Grid Flexibility Seamlessly switch between on-grid and off-grid modes, providing stable energy supply whether connected to the grid or operating independently. Real ...

A novel method for optimal placement of vehicle-to-grid charging stations in distribution power system using a quantum binary lightning search algorithm Sustainable ...

The aim of this work is to design a model to determine the optimal number of the drone hubs, along with their configuration. Moreover, we will determine their location and size, ...

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