

# **Solar-powered container hybrid type for highways**





## Overview

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In this paper, a portable wind-photovoltaic power generation system (WPPGS) based on the foldable umbrella mechanism is presented. The proposed WPPGS is installed in the medians of highways, and it ca.

Is there a portable wind-photovoltaic power generation system for highways?

In this paper, we propose a portable wind-photovoltaic power generation system based on the foldable umbrella mechanism for applications on highways. The proposed WPPGS is installed in the median of the highway, which can simultaneously capture the solar energy and wind energy produced by running vehicles.

Can grid-integrated PV and energy storage systems improve performance?

Lavanya et al. (Lavanya et al., 2024) investigated the performance improvement on the grid-integrated PV and energy storage system, and the results show that the power quality and system efficiency can be upgraded up to 97.8 % with the storage control strategies.

What is the potential for solar energy harvesting?

The results showed that the measured annual energy yield could be up to 78 kWh/m<sup>2</sup>. Although the potential for solar energy harvesting is huge, it is severely affected by weather changes, seasonal replacement and day-night alternation.

How much power can be generated by solar-energy-harvesting sub-module?

Besides, theoretical and simulation results show that the annual power generation of the solar-energy-harvesting sub-module, wind collection sub-module and entire WPPGS system installed on all highways in China mainland can be up to 155 GWh, 201 GWh and 356 GWh, respectively.



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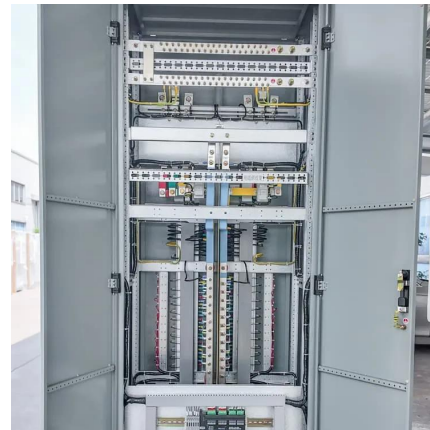


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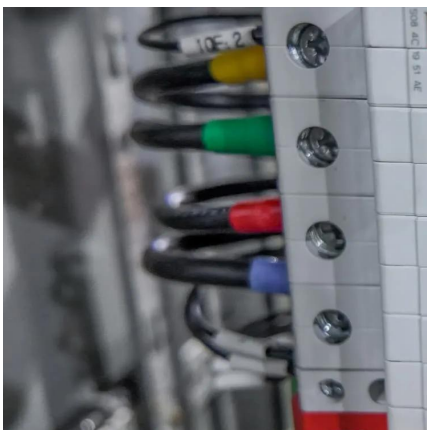
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