

Automobile photovoltaic transformation outdoor power supply

Can a photovoltaic power system supply electric vehicles?

An electric vehicle in Chengdu city was simulated for a case study. The results show that the annual output of a single photovoltaic power system can drive the MINIEV for 423.625 km, indicating that the proposed system would be able to supply power for electric vehicles as an auxiliary power supply system.

Can auxiliary photovoltaic power system be used for electric vehicles?

However, restrictions on the driving range and charging have hampered the promotion of electric vehicles. This study proposes a portable, auxiliary photovoltaic power system based on a foldable scissors mechanism for electric vehicles. The system includes a photovoltaic power generation module and an electricity transfer module.

Can photovoltaic modules help a car's propulsion?

Photovoltaic modules can contribute to the vehicle's propulsion or energize its accessories, such as ventilation, air conditioner, heated passenger seats, interior lighting. The results demonstrate feasibility of the proposed solutions for both cases with and without sun-tracking adjustments of solar panels.

Can a photovoltaic power generation module be used for electric vehicles?

The area of the proposed photovoltaic power generation module is relatively small, only 0.47 m^2 , while a car usually occupies more than 10 m^2 ; therefore, the area of the photovoltaic power generation module can be increased to generate higher output power for electric vehicles.

Can foldable solar panels power electric vehicles?

Many studies have been conducted on PV-powered EVs. A foldable scissors mechanism was used in Jin et al.'s (2022) study to provide portable, auxiliary solar power for electric vehicles. Foldable solar panels, batteries, and inverters are included in the system, which can be stored in a trunk of an electric vehicle.

Can auxiliary photovoltaic power system extend the range of EVs?

An auxiliary photovoltaic system combined with WPT is proposed to use solar energy resources to extend the range of EVs while considering the portability and versatility of the photovoltaic system. The overall structure and working principle of the auxiliary photovoltaic power system for EVs are presented in Fig. 4.

The utility model discloses a kind of electric automobile photovoltaic system, including: Luminous energy is changed into the photovoltaic module of electric energy output, on-vehicle battery to be charged, one-level electricity housing unit, two level electric energy sustained release discharge cell have been sequentially connected electrically between photovoltaic module and on-vehicle ...

This manuscript highlights various aspects, challenges, and problems for solar vehicle development. In fact,

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this chapter widely reviews vehicle-integrated photovoltaic panels where different power train ...

Due to that photovoltaic power generation, energy storage and electric vehicles constitute a dynamic alliance in the integrated operation mode of the value chain (Liu et al., 2020, Jicheng and Yu, 2019, Jicheng et al., 2019), the behaviors of the three parties affect each other, and the mutual trust level of the three parties will determine the depth of cooperation in the ...

The PV part will cover an area of approximately 4000 m², with a total installed capacity of 850 kWp (the peak total power of PV cells), and the total investment is approximately CNY 4.2 million. The "PV-storage-charging-discharging" integration features 16 charging stations, including 4 V2G-capable charging and discharging terminals, and ...

This research presents a novel Hybrid Energy System (HES) that integrates Photovoltaic (PV) and wind power systems into the grid, providing a continuous, reliable power ...

However, due to the randomness and uncertainty of photovoltaic power generation, the direct access of photovoltaic power generation to rail transit power supply system will bring a certain impact on rail transit power supply system. Accurate photovoltaic power generation prediction is an effective way to reduce the impact of photovoltaic grid ...

Introducing renewable electric energy as the energy supply for the production and recycling processes of power batteries not only helps to reduce the carbon footprint at these stages, but also promotes the environmental friendliness of the entire life cycle [17]. The incorporation of renewable electric energy is not only an addition to the methods of evaluating ...

China has accelerated integration of its new energy vehicles (NEVs) with energy transformation. ... An electric vehicle runs on the road in Xiongan New Area, north China's Hebei Province, March 31, 2023. /CFP ... whereby ...

An electric vehicle in Chengdu city was simulated for a case study. The results show that the annual output of a single photovoltaic power system can drive the MINIEV for 423.625 km, indicating that the proposed system would be able to supply power for electric vehicles as an auxiliary power supply system.

The invention relates to an automobile roof flexible photovoltaic component system and a control method, the system comprises a flexible photovoltaic component for receiving solar energy, and a reel component, a sensor component, a microcomputer, a power supply, a module unit and a dragging motor which are integrated with the flexible photovoltaic component into a whole, ...

Considering three commonly used vehicle variants in the automotive sector, such as the hatchback, sedan, and sport utility vehicle, Fig. 12 describes the average available area (in m²), which aids in integrating solar

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photovoltaic cells [71]. Unlike rigid solar structures, it is apparent that vehicles have limited space for solar PV inclusion.

China's railway transportation system as a large user of the power grid, annual power consumption can be as high as 40 billion kwh [1]. With the passage of time, China's railway electrification business mileage is still growing rapidly, as shown in Fig. 1 the end of 2019, China's electrification mileage has reached 100,000 km, more than 70% of the national railway ...

For the economic analysis, the total PV cost is estimated through the total PV power (Wp) and cost of unit PV power (EUR/Wp). Since the cost of PV changes drastically based on the PV cell material and types, two different cost projections were considered with 0.6 EUR/Wp (J.R.C., 2019) and 0.35 EUR/Wp (PVxchange, 2021).

For example, over 30% of sites in China need mains modernization; the reconstruction period of the mains capacity expansion in South Africa is about 12 months, and that in Germany is about 10 months; the

Equivalent figure of PV arrangement for different railway directions: (a) north-south railway arrangement; (b) east-west railway arrangement. ...

Hamed et al. have devised a resilient "Maximum Power Point Tracking" (MPPT) algorithm utilizing first-order sliding mode control for triple-junction PV power networks that ...

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207128643 U CN207128643 U CN 207128643U Authority CN China Prior art keywords automobile body
photovoltaic automobile substrate electric automobile Prior art date 2017-07 ...

Once known as the "golden fault zone" along the southeastern coast of China, Ningde, East China's Fujian Province, has grown from an economic laggard to become a modern and rich city leading ...

7.1.3 Current Status of In-Vehicle PV Power Systems. The in-vehicle PV power generation system is new research in the field of solar energy applications and an effective auxiliary energy supply system for vehicles. The application of in-vehicle PV systems in automobiles is more developed both in China and internationally.

China's foreign trade landscape is undergoing a green transformation as traditional export categories, such as clothing and furniture, make way for high-tech innovations in the new energy sector ...

The photovoltaic power generating station (PPGS), DC-DC Bi-directional boost converter (BDBC), Energy storage station (ESS), and E-Vehicle charging station (EVCS) are ...

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The present invention relates to electric vehicle engineering field, it is intended to solves the problems, such as that existing electric automobile can not ensure high mileage traveling. The...

Column (3-4) shows that when the average number of hours with power outages at the district level of a given month increases by 1 h, the number of new EVs adopted per month decreases by 0.024% ...

Photovoltaic modules can contribute to the vehicle's propulsion or energize its accessories, such as ventilation, air conditioner, heated passenger seats, interior lighting. The ...

An inverter's primary job is to transform direct c urrent ... value of a photovoltaic power charging station that meets the daily electricity demand of 4500 kWh is \$3,579,236 and that the cost of ...

The studied plant is composed of a photovoltaic (PV) system, a lead-acid electrochemical battery bank, a diesel generator, and electro-electronic loads with highly variable demand throughout the year.

Abstract: In recent years, the rapid development of electric vehicle vehicles, in order to use solar energy to generate electricity with the vehicle and improve the range of electric vehicles, a ...

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