Bidirectional Charging of Jordanian Photovoltaic Energy Storage Containers for Ships

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Are bidirectional EVS a viable option in Jordan?
While bidirectional EV setups enhance self-consumption and reduce dependence on the external grid,they face financial challenges,including higher initial costs and a lower net present value (NPV) due to maintenance expenses. In Jordan the time-of-use (TOU) pricing system has applied for EVs charging.

How does a bidirectional charging system work?
For the bidirectional charging system depicted in Fig. 4 b, the PV system charges the EV battery via unidirectional charging but introduces a discharging functionality to manage the energy distribution dynamically. This prevents the SOC from remaining fully discharged at 100% SOC, as energy is discharged when needed.

Are unidirectional and bidirectional electric vehicle chargers profitable in Amman?
The results of the profitability study comparing unidirectional and bidirectional electric vehicle (EV) chargers in Amman are presented in Table 5. In general, the investment costs of the unidirectional EV system are lower than the initial investment costs of the bidirectional system (7,480 USD vs. 8,880 USD).

What is EV bidirectional charging?
Unlike unidirectional charging,bidirectional charging distributes excess PV power more effectively,maximizing the benefits of solar generation and supporting energy demand more efficiently. The use of EV bidirectional technology reduces total electricity consumption.

This integration method allows solar photovoltaic or other renewable energy sources to operate in a bidirectional charging/discharging manner with the energy storage ...

The proposed GBES efficiently utilizes the integrated energy system comprising charging stations and

adjacent buildings, maximizing ...

This paper introduces a novel testing environment that integrates unidirectional and bidirectional charging infrastructures into an existing hybrid energy storage system.

The proposed GBES efficiently utilizes the integrated energy system comprising charging stations and adjacent buildings, maximizing the use of photovoltaic energy and ...

The objective of this article is to propose a photovoltaic (PV) power and energy storage system with bidirectional power flow control and hybrid charging strategies.

This integration method allows solar photovoltaic or other renewable energy sources to operate in a bidirectional ...

The aim of the project was to optimise the geographical and temporal distribution of surplus energy from renewable energy systems (RE systems) using bi-directional electric vehicles ...

This numerical study highlights the implementation of two types of charging--unidirectional and bidirectional--for evaluating the economic and environmental ...

PVsyst (Version 7.3.4) is implemented to simulate the water flow rate pumped to the upper reservoir at each location. The water in the upper reservoir is presumed to flow back into the ...

The case study focuses on rural distribution grids in Southern Germany, projecting the repercussions of different charging scenarios by 2040. Besides a Vehicle-to-Grid scenario, ...

This research analyzes the economic and environmental impacts of unidirectional versus bidirectional EV charging systems integrated with renewable energy in Jordan, particularly ...

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The solar-powered bidirectional charging system for electric vehicles is a ground-breaking solution at the confluence of sustainable mobility and energy efficiency.

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