

Price reduction for bidirectional charging using inverter cabinets at railway stations

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What is a bidirectional converter based charging station?

A bidirectional converter-based charging station works on V2G and G2V modes for charging the EV battery and supports the grid or isolated power station when it is needed. In this paper, a brief discussion on the previous development of bidirectional conversion is presented. A bidirectional converter is modeled and simulated in Simulink.

What is bidirectional charging?

The bidirectional charging concept will help the grid support at the peak load period, and consumers will be benefited from the incentives as per energy provided by the EV. EV charge scheduling and charging station assignment lead the researcher to deliver the optimum solution with ease of operation.

Why do we need a bidirectional converter?

Consumers are encouraged to use it for its running cost instead; it is limited due to a lack of good charging infrastructure at home, public or parking charging. Using the bidirectional converter, power electronics devices with controlling techniques can achieve the vehicle to the grid.

Does bidirectional charging reduce NPV?

Owing to higher initial costs, bidirectional charging experiences a temporary decline in NPV because of possible costs associated with maintenance, infrastructure, or grid integration. However, bidirectional charging could still be beneficial for energy optimization and grid support, despite its lower NPV.

bidirectional converter model is presented with the control methodology of slow and fast charging process [14]. The charging and discharging structure is developed by the consumer ...

This study aims to compare the unidirectional and bidirectional charging optimization techniques proposed to minimize the EV charging cost and the impact of high penetration of EVs on ...

This study reveals that the bidirectional EV charging improves energy efficiency and reduces CO₂ emissions by optimizing PV energy utilization in Jordan to charge EVs, however, its ...

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Bidirectional charging (BDC) is a promising solution that allows EVs to charge from the grid and supply excess power back to the grid. In this paper, we present a simulation-based study of ...

Dynamic pricing is a promising strategy to address the challenges of smart charging, as traditional time-of-use (ToU) rates and stationary pricing (SP) do not dynamically react to changes in ...

In this paper, a brief discussion on the previous development of bidirectional conversion is presented. A bidirectional converter is modeled and simulated in Simulink.

A four-stage intelligent optimization and control algorithm for an electric vehicle (EV) bidirectional charging station equipped with photovoltaic generation and fixed battery energy storage ...

In this paper, two multi-port bi-directional converters are proposed to be utilized as off-board Electric Vehicles (EVs) charging station.

EV charging and discharging with grid integration are required to achieve the bidirectional operation of the given system. The bidirectional converter is designed and described ...

For EVCS, the main issue is the evaluation of the impact of more units on the distribution grid, in terms of voltage level, losses, and disturbances injected into the grid. Different methods can ...

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