

# Bidirectional Charging of Bragg Photovoltaic Folding Containers for Marine Use



## Overview

---

Can bidirectional charging reduce the need for large-scale battery storage?

The additional use of this storage capacity for bidirectional charging could reduce the need for large-scale battery storage beyond the scope of the Electricity Network Development Plan (NEP) and the associated costs and resource consumption. Bidirectional charging is economical for customers.

How can bidirectional charging/discharging a battery achieve maximum PV power utilization?

In addition, with the proposed strategies, the bidirectional charging/discharging capability of the battery is able to achieve the maximum PV power utilization. All the proposed strategies can be realized by the digital signal processor without adding any additional circuit, component, and communication mechanism.

Can a BHG converter be used to charge an EV?

The presented EV with a charging system is simulated in the MATLAB/Simulink platform, and real-time validation is performed using the Opal-RT platform. The results obtained through both the simulation and real-time prototype indicate the effectiveness of the developed charging scheme with the proposed BHG converter.

Does bidirectional storage reduce energy supply costs in Europe?

The bidirectional development of the existing storage capacity in electric vehicles for the energy system reduces the energy supply costs in Europe compared to a scenario without bidirectional electric vehicles. The use as daily storage improves the system integration of renewable energies and PV energy in particular.

## Bidirectional Charging of Bragg Photovoltaic Folding Containers for

---

The additional use of this storage capacity for bidirectional charging could reduce the need for large-scale battery storage beyond the scope of the Electricity Network Development Plan (NEP) and the associated costs and resource consumption. Bidirectional charging is economical for customers

In addition, with the proposed strategies, the bidirectional charging/discharging capability of the battery is able to achieve the maximum PV power utilization. All the proposed strategies can be realized by the digital signal processor without adding any additional circuit, component, and communication mechanism.

The presented EV with a charging system is simulated in the MATLAB/Simulink platform, and real-time validation is performed using the Opal-RT platform. The results obtained through both the simulation and real-time prototype indicate the effectiveness of the developed charging scheme with the proposed BHG converter.

1. Introduction  
The bidirectional development of the existing storage capacity in electric vehicles for the energy system reduces the energy supply costs in Europe compared to a scenario without bidirectional electric vehicles. The use as daily storage improves the system integration of renewable energies and PV energy in particular.

The additional use of this storage capacity for bidirectional charging could reduce the need for large-scale battery storage beyond the scope of the Electricity Network ...

Design and development of a bidirectional high gain converter (BHGC) that can operate efficiently in both Grid-to-Vehicle (G2 V) and Vehicle-to-Grid (V2 G) modes, utilizing ...

The Bidirectional Charging project, which began in May 2019, aimed to develop an

intelligent bidirectional charging management system and associated EV components to ...

Bidirectional charging allows for higher use of volatile renewable energies and can accelerate their integration into the power system. When considering these diverse ...

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

The primary objective is to analyze business use cases for bidirectional charging and barriers to its widespread adoption. It seeks to identify potential business models, ...

View a PDF of the paper titled Bidirectional Charging Use Cases: Innovations in E-Mobility and Power-Grid Flexibility, by Shangqing Wang and 2 other authors

To achieve charging and discharging modes, a bidirectional converter needs to be used with control on battery charging voltage and battery discharge current. For conversion of ...

Electric vehicle (EV) charging infrastructure has led to the advancement of grid-tied photovoltaic (PV) battery energy systems (BES) that support bidirectional energy flow. ...

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. In order to ...

## Contact Us

---

For catalog requests, pricing, or partnerships, please contact:

**NKOSITHANDILEB SOLAR**

Phone: +27-11-934-5771

Email: [info@nkosithandileb.co.za](mailto:info@nkosithandileb.co.za)

Website: <https://nkosithandileb.co.za>

*Scan QR code to visit our website:*

