Microgrid energy storage ville neuss

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Citation: Aldosari O, Ali ZM, Abdel Aleem SHE, Mostafa MH (2024) Optimizing microgrid performance: Strategic integration of electric vehicle charging with renewable energy and storage systems for total operation cost and emissions minimization. PLoS ONE 19(10): e0307810. https://doi /10.1371/journal.pone.0307810

Editor: Yu Zhou, Inner Mongolia University, CHINA

Received: February 28, 2024; Accepted: July 11, 2024; Published: October 3, 2024

Data Availability: All relevant data are within the manuscript.

Funding: This project was supported by the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University under the research project (PSAU/2023/01/25194). The contributions of the funder to this publication include supervision, approving the methodology, and reviewing the paper.

Competing interests: The authors have no relevant financial or non-financial interests to disclose. The authors have no competing interests to declare that are relevant to the content of this article.

Within the context of integrating traffic networks and power grids, Lixun et al. [37] developed a comprehensive evaluation system and methodology for EV charging networks. Initially, an EV travel model is constructed, utilizing a trip probability matrix to analyze the geographical and temporal characteristics of EV usage. Subsequently, the interconnectedness among users, the road network, the power grid, and the charging infrastructure is examined. The study proposes four critical criteria: user feedback, the operational impact on the road network, the functionality of the charging network, and the influence on the power grid"s operation. For each criterion, specific evaluation indices are established, culminating in a holistic evaluation index system.

Subramaniam and Singh [38] detailed a strategic optimization approach for the charging of EVs and the selection of optimal installation sites. The main objective is to develop a charging network that is cost-effective while maintaining the operational integrity of the distribution network. The methodology addresses these challenges by employing renewable energy sources and meta-heuristic algorithms for optimal planning, taking into consideration the impacts of various factors. Consequently, this study introduces a novel perspective on managing the distribution of RES and charging station challenges, advocating for a multi-objective approach that incorporates the characteristics of charging stations.

Wenchao et al. [39] proposed a methodology to ascertain the optimal number of charging stations alongside a pricing strategy for EVs, considering various configurations of component commonality. The study explored four distinct scenarios characterized by differing common components and levels of quality. For each scenario, the optimal quantity of charging stations and the corresponding EV pricing were determined. Subsequently, through numerical simulations, the researchers evaluated the most favorable solutions and manufacturer profits across these scenarios, yielding insightful managerial implications.

In this study, the optimal EM of an mG, encompassing PVs, FCs, WTs, ESSs, and EVCSs, is optimized using the innovative krill herd algorithm (KHA), an algorithm that has garnered significant attention. This paper delivers an optimization strategy for managing the energy of an mG to fulfill multi-objective functions, including the minimization of total operational costs, maximization of BSS profits, and reduction of total emissions. The novelty of this work can be summarized as follows:

The main contributions of this research are outlined as follows: