

Economic and technical evaluation indicators of microgrids



Overview

The MPIR index evaluates microgrid configurations based on five critical dimensions: financial viability, sustainability, regional renewable integration readiness, energy demand, and community engagement, facilitating comprehensive and balanced decision making. This paper presents the Microgrid Performance and Investment Rating (MPIR) index, a novel assessment framework developed to link economic and environmental objectives within microgrid configurations. Addressing. Amid high renewable penetration, market reform, and dual-carbon goals, microgrids are expected to deliver economic, environmental, and technical value, yet much work remains static or single-dimensional and lacks a closed loop from evaluation to fair sharing and incentives.



Article Content

Evaluating Microgrid Investments: Introducing the MPIR Index for ...

This paper presents the Microgrid Performance and Investment Rating (MPIR) index, a novel assessment framework developed to link economic and environmental objectives within

Agricultural Waste for Hybrid Microgrids: Systematic Review -Solar ...

The imperative transition to decentralized energy systems has catalyzed the positioning of hybrid microgrids that integrate biogas derived from agricultural waste with photovoltaic solar energy as

Dynamic evaluation and realization mechanisms of multi ...

This study presents an integrated framework for evaluating the multi-dimensional benefits of microgrids in new-type power systems, focusing on economic, environmental, and technical

Research on Performance Evaluation Index System and Assessment

In this paper, the performance indicators of microgrids in port areas are hierarchically structured and classified into five dimensions: economic, energy efficiency, environmental, system

Renewable energy microgrids: Economic evaluation and decision

Overall, the use of renewable energy microgrids seems to be an effective solution for tackling global warming by acting as a clean energy management scheme. In addition to its

A critical review on techno-economic analysis of hybrid renewable ...

This required an evaluation of different RE components of varying sizes and an assessment of economic benefits and technological advances. Subsequently, Blok and ter Horst

Microgrids: A review, outstanding issues and future trends

- Objective and scope: The primary objective of this review is to evaluate the current state of knowledge regarding MGs, identify outstanding issues, and investigate potential future trends. The

Optimization of Hybrid Renewable Microgrids for Isolated

This paper analyzes the technical and economic performance of four off-grid hybrid power system configurations for a rural coastal site using HOMER Pro simulations. Configurations combining

Review on microgrids design and monitoring approaches for ...

Microgrids are power distribution systems that can operate either in a grid-connected configuration or in an islanded manner, depending on the availability of decentralized power

Evaluating Microgrid Investments: Introducing the MPIR Index for

This paper presents case studies in which the MPIR index is applied to different microgrid scenarios. It demonstrates its effectiveness in identifying optimal configurations that reduce

Empowering communities beyond wires: Renewable energy microgrids

This systematic review investigates the impact of renewable energy microgrids on alleviating energy poverty and enhancing socio-economic outcomes in underserved communities.

Optimal Operation of Energy Microgrid Considering Economic and

This study focused on optimizing the performance of energy microgrids, factoring in economic and environmental metrics for day-ahead planning. The proposed microgrid features a

Techno-economic Evaluation of Utilizing a Small-Scale Microgrid

Morris GY, Abbey C, Wong S, JoÃ³s G, editors. Evaluation of the costs and benefits of Microgrids with consideration of services beyond energy supply. 2012 IEEE Power and Energy

(PDF) Sizing with Technical Indicators of Microgrids with Battery ...

To evaluate the utility and effectiveness of the proposed method, as well as the technical feasibility and economic viability of the suggested grid-independent MECM layout, a numerical case

Multi-dimensional Microgrid Ecosystem Performance Metrics ...

Utilizing a case study of Gili Trawangan's electricity system, the paper introduces 13 popularly used metrics, encompassing economic, renewability, and resilience aspects of microgrid performance.

Economic Analysis and Optimal Design on Microgrids With SS-PVs for ...

This paper proposes an optimal design model of microgrids with small-scale photovoltaic systems (SS-PVs) and storage batteries for industries along with three economic evaluation

Reliability evaluation, planning, and economic analysis of microgrid ...

Reliability evaluation and economic analysis of microgrid. Provide a reference for the capacity planning of the microgrid. The integration of renewable energy (RE) and electric vehicles

Microgrids: A review of technologies, key drivers, and outstanding ...

Microgrids are now emerging from lab benches and pilot demonstration sites into commercial markets, driven by technological improvements, falling costs, a proven track record, and

Optimal Sizing and Techno-Economic Evaluation of Microgrids Based

The rapid development of distributed renewable energy has made energy storage essential for demand reliability and flexible energy management. Due to the high investment costs of

(PDF) Renewable energy microgrids: Economic evaluation and decision ...

Illustration of how the economic performance indicators can help government decision making. NPV calculation of renewable energy microgrid generating 1kWh (per year).

Quantification of Technical, Economic, Environmental and Social ...

A section demonstrates sensitivity analysis with regard to preset conditions being performed to evaluate microgrid performance under various evaluation indices. The effects of market

Assessment of Economic, Technical, Social and Environmental

The proliferation of renewable energy sources, with their inherent uncertainty in smart microgrids, necessitates the use of flexible resources to maintain grid stability. However, implementing these

Dynamic evaluation and realization mechanisms of multi ...

Abstract Amid high renewable penetration, market reform, and dual-carbon goals, microgrids are expected to deliver economic, environmental, and technical value, yet much work

A critical review on techno-economic analysis of hybrid renewable ...

This paper gives a combined review of various research papers that discuss some case studies and some research on various models designed on software like HOMER Pro, how microgrids become

Sizing with Technical Indicators of Microgrids with

It enables the evaluation of various configurations of hybrid energy systems, considering renewable energy sources, energy storage, and other

Optimal planning and operation of heterogeneous autonomous and

Further, relying solely on the estimated dataset for such evaluations can pose risks for planning and decision-making. Therefore, using a real-time dataset, this study conducts a

Technical and economic analysis of a micro grid including various ...

Through the assessment of technical, environmental, and economic dimensions, this study provides an integrated framework for rural electrification and contributes to the transition

Renewable energy microgrids: Economic evaluation and decision

This study collects publicly available financial data from 24 microgrid projects worldwide and investigates the economic performance of renewable energy microgrids by evaluating key

Optimal Sizing and Techno-Economic Evaluation of Microgrids Based

Due to the high investment costs of fresh batteries (FB), achieving a positive and efficient economy takes work. However, second-life batteries (SLB), whose capacity decreases by 20-30%

(PDF) Performance evaluation of microgrids: Unraveling trends

Performance evaluation of microgrids: Unraveling trends through bibliometric analysis and thematic quantification

Optimal planning and operation of heterogeneous autonomous and

The study aims to conduct a comparative evaluation encompassing multi-criteria techno-economic, environmental, and social indices of standalone and grid-integrated hybrid microgrids

Contact Us

For more information, pricing, or custom solutions, please contact us:

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

Email: info@mypaarl.co.za

Phone: +27-63-214-5897

Address: 23 Paarl Main Road, Unit 5, Paarl, Western Cape, 7646, South Africa

This document is for informational purposes only. Specifications subject to change without notice.

