

Title: Optimizing Rooftop Solar PV Systems for Energy Efficiency in Urban Environments: A Case Study of Bangladesh(Conference Paper)

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Abstract

This study investigates the optimization of rooftop solar photovoltaic (PV) systems to enhance energy efficiency in urban environments, focusing on a case study in Bangladesh. Amid rising global energy consumption and environmental concerns, rooftop solar PV systems offer a sustainable alternative to energy generation. Despite the substantial initial investment, these systems provide long-term cost savings due to low operational and maintenance expenses. This research addresses challenges in efficiently utilizing the roof areas of academic buildings for solar installations, considering factors such as shading, tilt angle, and geographical location. The study reveals significant energy generation and cost reduction potential, with rooftop solar installations capable of decreasing grid energy consumption and fostering sustainable development. Findings emphasize the importance of optimal design and implementation of

rooftop solar PV systems in academic institutions, supporting renewable energy integration and sustainability initiatives. This research offers insights into the effects of tilt angles on energy generation and system performance, providing practical solutions for maximizing energy efficiency in educational buildings. © 2024 IEEE.

Author keywords

BIPV Energy efficiency Energy Efficient Building Rooftop Solar PV Smart Energy Management

- **ISBN:** 979-833151798-4
- **Source Type:** Conference Proceeding
- **Original language:** English
- **DOI:** 10.1109/PEEIACON63629.2024.10800163
- **Document Type:** Conference Paper
- **Publisher:** Institute of Electrical and Electronics Engineers Inc.