PEES Power Systems

Insights on solar photovoltaic power generation

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Gaining Insight into Solar Photovoltaic Power Generation ...

The objective of this article is to apply XAI methods on solar PV power generation forecasting and to interpret "black-box" machine learning models so that it can be used in smart grid applications with a proper ...

Solar PV Energy Factsheet

Solar energy can be harnessed two primary ways: photovoltaics (PVs) are semiconductors that generate electricity directly from sunlight, while solar thermal technologies use sunlight to heat water for domestic ...

Global Market Outlook for Solar Power 2025-2029

Solar accounted for 81% of all new renewable energy capacity added worldwide. While remaining a modest contributor to overall electricity generation for now, solar's share rose to 7% in 2024 - nearly ...

SPXAI: Solar Power Generation with Explainable AI Technology

The integration of XAI with machine learning and deep learning technologies has markedly advanced the field of solar power generation. The proposed SPXAI model effectively tackles the unpredictability of solar energy by ...

Trends in PV Applications 2025

According to the report, 2024 was another record year for solar PV, with between 553 GW and 601 GW newly installed worldwide.

Gaining Insight Into Solar Photovoltaic Power Generation Forecasting

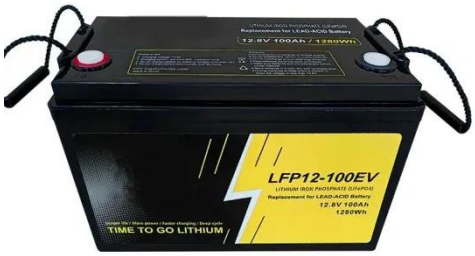
This article presents several use cases of solar PV energy forecasting using XAI tools, such as LIME, SHAP, and ELI5, which can contribute to adopting XAI tools for smart grid applications.

A Comprehensive Overview of Photovoltaic Technologies and Their

Solar photovoltaic (PV) technology is a cornerstone of the global effort to transition towards cleaner and more sustainable energy systems. This paper explores the pivotal role of PV technology in ...

Advances in the performance and adoption of solar photovoltaics

The past decade has seen exceptional progress in solar photovoltaics. Over 700 gigawatts of solar photovoltaic modules were installed in 2025, more than ten times the 56 gigawatts installed in 2015.



A review of solar photovoltaic technologies: developments, challenges

This review examines the evolution, current advancements, and future prospects of PV systems, highlighting the development of various photovoltaic cell technologies, including crystalline silicon, ...

Executive summary - Renewables 2025 - Analysis

Solar PV accounts for almost 80% of the global increase, followed by wind, hydropower, bioenergy and geothermal. In more than 80% of countries worldwide, renewable power capacity is set to grow faster ...

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