The optimal balance and dispatch of power plants in a smart grid require an accurate short-term forecast of photovoltaic (PV) power generation. The climatic condition may have an impact on the PV output, but it is difficult to be used in forecasting due to untimely sampling of meteorological data.To this end, this paper presents an incremental learning using ...

The development of residential solar photovoltaic has not achieved the desired target albeit with numerous incentive policies from Chinese government. How to promote sustainable adoption of residential distributed photovoltaic generation remains an open question. This paper provides theoretical explanations by establishing an evolutionary game model ...

LOWESS smoothing and Random Forest based GRU model: A short-term photovoltaic power generation forecasting method. Yeming Dai, Yanxin Wang, Mingming Leng, Xinyu Yang and Qiong Zhou. Energy, 2022, vol. 256, issue C . Abstract: Accurate prediction of photovoltaic power generation is vital to guarantee smooth operation of power stations and ensure users" ...

The PV power generation system is shown in Fig. 2. The system consists of PV arrays, inverters, batteries, controllers, as well as other components. Among them, the PV array, composed of many solar cells arranged in a specific arrangement, is the most important part. ... Xinyu Zhou: Methodology, Investigation, Writing - original draft ...

The primary means to promote grid-connected photovoltaic power generation is through accurately forecasting the power output from photovoltaic power stations. This paper proposes a method for day-ahead photovoltaic power forecasting (PPF) and uncertainty analysis using fuzzy c-means (FCM), whale optimization algorithm (WOA), least squares support vector machine ...

DOI: 10.1016/J.APENERGY.2021.117291 Corpus ID: 237708003; Forecasting and uncertainty analysis of day-ahead photovoltaic power using a novel forecasting method @article{Gu2021ForecastingAU, title={Forecasting and uncertainty analysis of day-ahead photovoltaic power using a novel forecasting method}, author={Bo Gu and Huiqiang Shen and ...

Xinyu Tong. State Grid Tianjin Electric Power Company, Tianjin, China. Contribution: Funding acquisition. Search for more papers by this author. Sheharyar Hussain, ... EV charging users, and residential energy management platforms. Following PV power generation and grid integration, electricity is distributed to users via the public power ...

In this paper, we introduce LOWESS data smoothing to reduce photovoltaic power generation volatility, conduct a cross-sectional comparison to select the optimal correlation analysis method for eliminating

redundant features, and then use Random Forest to rank other influencing factors and streamline the features. ... Xinyu and Zhou, Qiong ...

Xinyu Sinohydro Solar PV Park is a ground-mounted solar project. The project cost is expected to be around $73.5m. The solar power project consists of 222,400 modules, each with 450W nameplate capacity.

Applied Energy Symposium and Forum 2018: Low carbon cities and urban energy systems, CUE2018, 5âEUR"7 June 2018, Shanghai, China Prediction of Photovoltaic Power Generation Based on General Regression and Back Propagati n Neural Network Jiaqi Zhonga, Luyao Liua, Qie Suna, Xinyu Wanga* aInstitute of Thermal Science and Technology, ...

Accurate forecasting of photovoltaic power generation is vital importance to guarantee the smooth operation of photovoltaic power stations and ensure the power consumption of end-users. ... Dai, Yeming and Wang, Yanxin and Yang, Xinyu and Zhou, Qiong, LOWESS Smoothing and Random Forest Based GRU Model: A Short-Term Photovoltaic ...

The distributed photovoltaic power generation is an important way to make use of solar energy in cities. China issues a series of policies to support the development of distributed photovoltaics ...

Mingliang Bai1, Xinyu Zhao2, Zhenhua Long2, Jinfu Liu2*, Daren Yu1,2 1. Department of Control Science and Engineering, Harbin Institute of Technology, 150001, ... photovoltaic (PV) power generation has been developing rapidly in the recent years [3,4]. PV power are affected by solar irradiation, temperature, cloud, weather etc[5]. These ...

Considering the various navigation situations that the ship may encounter, such as photovoltaic power generation limit in extreme weather and diesel generator power change in load shedding, the corresponding scheduling optimization problems for the hybrid energy ship power system are established. ... Xinyu Wang. School of Electrical Engineering ...

Solar photovoltaic (PV) power generation is the process of converting energy from the sun into electricity using solar panels. Solar panels, also called PV panels, are combined into arrays in a PV system. PV systems can also be installed in grid-connected or off-grid (stand-alone) configurations. The basic components of these two configurations ...

Amid the depletion of fossil fuels and global warming concerns, photovoltaic (PV) power generation is gaining recognition as an environmentally friendly and secure source of renewable energy [1], [2], [3].However, PV power is susceptible to external factors, leading to volatility and multi-interference, which pose significant challenges for grid-connected PV systems.

Considering the power generation and solar power, a fuzzy logic-based energy management strategy was proposed. 23 To optimize the capacity of photovoltaic generation and energy storage systems, a particle

swarm-based optimization algorithm was introduced. 24 Taking the effect of the vessel route and operation cost on the energy management system ...

The precise forecasting of photovoltaic (PV) power is important for efficient grid management. To enhance the analysis and processing capability of PV characteristics, address the feature extraction challenges for long sequences, and improve forecasting accuracy, this study presents a robust hybrid deep learning model for PV power forecasting. First, a dynamic mean ...

A large-scale renewable photovoltaic-wind-concentrating solar power hybrid system integrating an electric heating device is proposed to provide a sustainable power for a domestic region.

The aim of this work is to propose methods for maintaining demand-supply balance in PV power generation and distribution systems using a combined prediction-controller system and a real-time control algorithm that uses the outputs of prediction models and adjusts the output voltage of PV system to maintain demand-Supply balance.

sential for solar energy systems to achieve flexible power generation similar to coal-fired power or hydropower plants. This study introduced a switchable CPV/CSP hybrid system with a rotatable PV/heat collector. Unlike the conventional approach of designing energy storage equipment to meet power generation requirements, as reviewed in ref. [19 ...

To solve the issue of the contradiction between photovoltaic power generation and plant photosynthesis for sunlight demand, we propose a design method of multi-passband polymer multilayer...

solar flux of photovoltaic (PV). The hybrid system can directly transfer surplus solar energy into high-quality heat for storage using a rotatable PV/heat receiver. The simulated results ...

Due to the intermittency and indeterminacy of solar irradiance,balancing energy supply and load demand remains a challenge.This paper proposed a switchable hybrid system that combines ...

Abstract: The photovoltaic power generation system includes a controller and M groups of DC-DC circuits. Each group of DC-DC circuits include N DC-DC circuits, where M is a positive integer, and N is an integer greater than 1. An input end of each DC-DC circuit is connected to at least one photovoltaic unit, and each photovoltaic unit includes at least one ...