Solar Photovoltaic Power Generation Utility Patent

What are the patents on photovoltaic cells?
The patents on photovoltaic cells are concentrated in the area of semiconductors for the conversion of solar radiation into electric energy, in the area of generators for the direct conversion of light energy into electric energy and in the area of solar panels adapted for roof structures.

How has photovoltaic technology developed over the last 30 years?
Photovoltaic technology has developed rapidlyover the last thirty years. The main activities of photovoltaic patents began in the late 1950s and the main photovoltaic patent assignees at that time were involved in the space business ,. Patent data has been widely used in technology assessment and forecasting ,,,.

What is the technological system of solar photovoltaics?
2. The technological system of solar photovoltaics The PV technological systemis a power system comprises a sequence of interconnected components that work together to convert sunlight energy into electricity,utilize the generated energy,store it,or invert it (Fig. 1).

What is a photovoltaic energy payment program in China?
In China,it was launched in 2009 for installations with capacity over 50 kW,the solar photovoltaic energy payment program,which provides subsidy of US $2.93/Wof photovoltaic solar energy generated . There are also incentives to use renewable energy in residences,such as the net-metering system.

Why are photovoltaic cell patent registrations important?
Photovoltaic cell patent registrations are a valuable data set in the analysis and diffusion of PV technology and R&D activities. The dynamics of PV R&D activity is considered high,documented in a large increase in PV patent documents .

How many patents does first solar have?
In the ninth position,with 151 patents,is First Solar,a US company one of the largest manufacturers of photovoltaic solar modules with production units in the United States,Malaysia,Germany and Pakistan.

Patents help to power the world: tracing developments in solar energy capture, one patent at a time. As the world"s political leaders gather for the 26 th United Nations Climate Change Conference ... The electrical current generated became known as the photovoltaic effect. In the years that followed, mathematicians, scientists and physicists ...

As an important part of a new type of renewable energy, solar power generation has a well-developed prospect and is valued by all the countries in the world. Th. ... advantages and disadvantages of two common solar power generation technologies, photovoltaic power generation and photothermal generation are introduced. In

order to provide ...

The considerable advantages of third-generation photovoltaic solar cells may include solution-processable technologies, efficient technologies for commercial production, ...

For the generation of electricity in far flung area at reasonable price, sizing of the power supply system plays an important role. Photovoltaic systems and some other renewable energy systems are, therefore, an excellent choices in remote areas for low to medium power levels, because of easy scaling of the input power source [6], [7].The main attraction of the PV ...

A solar photovoltaic power plant is a regular power plant that converts solar energy into electricity through the photovoltaic effect.This effect occurs when sunlight photons bump into a specific material and displace an electron, which generates a direct current.. The acronym PV is commonly used to refer to photovoltaics.

The results indicate that 1) the number of patents deposited on photovoltaic cells grows every year, 2) the main depositor countries are the United States, China, Japan, Germany and South Korea, 3) American and Japanese organizations stand out with the highest number of patent registrations, 4) the main areas of knowledge were Engineering, Instruments and ...

r is the yield of the solar panel given by the ratio : electrical power (in kWp) of one solar panel divided by the area of one panel. Example : the solar panel yield of a PV module of 250 Wp with an area of 1.6 m2 is 15.6%. Be aware that this nominal ratio is given for standard test conditions (STC) : radiation=1000 W/m2, cell temperature=25 celcius degree, Wind speed=1 m/s, AM=1.5.

An emerging solar power generation technology is in the use of Building-integrated Photovoltaics (BIPVs), where photovoltaic materials are used to replace conventional building materials. In order to map the development of BIPV technology over time and explore technology paths, this study retrieved a total of 4914 patents dated from 1972 to 2016 from the ...

Distributed photovoltaic energy generation ... CPV systems generate more electrical power per unit area than PVs without solar concentration [6] and require sun-tracking mechanisms because they ...

Photovoltaic (PV) technology has witnessed remarkable advancements, revolutionizing solar energy generation. This article provides a comprehensive overview of the recent developments in PV ...

India is a fast-developing solar industry with a solar installed capacity of 66.97 GWAC as of the year 2022 and ranks fourth globally in 2021 in solar power generation. India has a solar potential of about 748 GW, assuming 3% of ...

: An automated system and method, which implements an electrical digital twin 5 (100), for efficient operation

& maintenance and asset management of a solar pv power plant is disclosed herein. The said system comprises plurality of weather sensors (400) for collecting "time-stamped" operational data of geo-location specific solar pv power plant in real-time or on ...

In the International Energy Agency"s (IEA) Sustainable Development Scenario, 4,240 GW of PV solar generating capacity is projected to be deployed by 2040 2, a 10,000-fold increase from 385 MW in ...

Solar energy is the conversion of sunlight into usable energy forms. Solar photovoltaics (PV), solar thermal electricity and solar heating and cooling are well established solar technologies. ... Power generation from solar PV increased ...

Abstract: An electrical transmission system has solar electrical generation stations mounted directly to existing utility poles along a transmission line. Solar panels and ...

The rest of the paper is structured as follows: Section 2 describes the structure of the employed test-system. The detailed modelling of the power system components along with the PV and network is discussed in Section 3.The proposed simultaneous active and reactive power control scheme is presented in Section 4.The flexible active power control scheme is ...

The Solar office supports development of low-cost, high-efficiency photovoltaic (PV) technologies to make solar power more accessible. ... (kWh) for utility-scale solar photovoltaics, $0.04 per kWh for commercial PV systems, and $0.05 per ...

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[Show full abstract] obtainable solar power from a PV module and use the energy for a DC and AC application. Integration of photovoltaic system with the diesel generator as a backup system is ...

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The clusters and evolution pathways for solar energy patents using the concept lattice algorithm are shown in Figure 12. A total of 52 patents from three categories (grid-connected energy storage systems, solar hydropower storage systems and thin film battery and PV cells) between 2014 and 2018 are displayed in the five concentric circle ...

The utility model discloses a vehicle-mounted solar-energy filtering power generation device, which can

improve the photoelectric conversion efficiency effectively. The device comprises solar battery assemblies, an air cooling system, an organic glass filter cover and cooling fins, wherein the solar battery assemblies are arranged on supports at the two sides of a shell body, the ...

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This patent could be implemented to achieve high receiver efficiency at low cost. Besides, patent WO2017130224 provided an intelligent inline connector device for connecting photovoltaic modules of a solar power generation system, with a wireless communication module placed within the connector part.

The photovoltaic service data of solar photovoltaic battery component, direct current header box and combining inverter is measured, shows and stored to the described grid-connected...