

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.

Are photovoltaic cells a technological development?

There is a prominence of deposited patents for polymer-based photovoltaic cell technologies, carbon nanostructures, III-V compounds, CdTe and amorphous silicon cells. The objective of this article is to identify the technological development of photovoltaic cells by the analysis of patents.

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 .

Which country has the most patent documents on photovoltaic cells?

The evolution of the total number of patent documents on photovoltaic cells per country in the period from 2004 to 2013 is shown in Fig. 7. It can be seen that the first two positions are occupied by the United States and China respectively, followed by Japan, Germany and South Korea. Fig. 7.

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.

What is the technological system of solar photovoltaics?

2. The technological system of solar photovoltaics The PV technological system is 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).

The present article has put forward a comprehensive patent analysis of solar PV technologies over the past six decades. To do so, it first defined the PV technological system distinguishing between different solar cell and balance of system technologies. It has further introduced a methodical approach for precisely identifying patent ...

First Solar believes the above five competitors are infringing its patents on a leading solar technology, executives said on a conference call on Tuesday. In July, First Solar said it held patents on its TOPCon crystalline ...

For the technologies that make up the class of photovoltaic IPC's, there was a distribution with predominance of Devices adapted for the conversion of radiation energy into electrical energy (56%), Assemblies of a plurality of solar cells (18%) and Electric lighting devices with, or rechargeable with, solar cells (9%), representing 83% of PV patents.

First Solar. has been granted a patent for a photovoltaic device featuring an electron blocking layer made of cadmium zinc telluride and an absorber layer of cadmium telluride selenide. The design minimizes lattice mismatch between the layers, enhancing efficiency in solar energy conversion. GlobalData's report on First Solar gives a 360-degree view of the company ...

In patent application US9171991B2, Dow Global Technologies LLC disclosed a highly automated method of interconnecting flexible solar cells to form solar modules with a wide variety of sizes...

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Since GIS leads to the global PV value chain segmentation, the PV technology innovation has attracted academic attention. Currently, most studies explore the PV technology innovation at a single country level (Zhao and Wei, 2020) or conduct a comparative analysis of the developing PV industry across two or more countries from a macroeconomic perspective (Choi ...

Thin-film solar-cell technologies lower the cost and weight by utilizing less material, and offer additional benefits of mechanical flexibility coupled with the potential for low-cost...

Solar photovoltaic (PV) technology is indispensable for realizing a global low-carbon energy system and, eventually, carbon neutrality. Benefiting from the technological developments in the PV industry, the levelized cost of electricity (LCOE) of PV energy has been reduced by 85% over the past decade [1]. Today, PV energy is one of the most cost-effective ...

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It is observed in Fig. 11 that there is a prominence of deposited patents for photovoltaic cell technologies considered to be emerging based on organic polymers, carbon nanostructures (graphene, carbon nanotubes, fullerene), compounds III-V, as well as cells of cadmium telluride and amorphous silicon. This prominence is due to the search for ...

DOI: 10.1016/J.SOLMAT.2011.07.002 Corpus ID: 94769444; Photovoltaic technology development: A perspective from patent growth analysis @article{Liu2011PhotovoltaicTD, title={Photovoltaic technology development: A perspective from patent growth analysis}, author={John S. Liu and Chung-Huei Kuan and Shi-Cho Cha and Wen-Ling Chuang and ...

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The use of photovoltaic cells, commonly called solar cells, is well known in the art. Solar cells are conventionally obtained as slices cut from specially prepared single crystal...

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