

Which solar power technologies can be used for sustainable electric power generation?

In this article, different solar power technologies have been reviewed which can be utilized for the global sustainable electric power generation. Major emphasis has been on solar photovoltaic (PV) and concentrated solar power (CSP) technologies. Their types, mechanism, efficiency and cost factors have been discussed.

Can solar power be used for sustainable electricity generation?

Solar power systems are relatively affordable and they are suitable for both urban and rural areas. With this background, solar power technologies which can be utilized for the development of a sustainable electricity generation have been thoroughly reviewed in this research work.

Why do we need a solar power system?

PV solar power systems have the potential to contribute significantly to supplying the world's energy demands in the future. They create zero emissions of greenhouse gases and are clean, renewable energy sources. This makes it a wise decision to lessen our reliance on fossil fuels and slow down global warming.

Why is solar energy a good resource for generating electricity?

It plays a substantial role in achieving sustainable development energy solutions. Therefore, the massive amount of solar energy attainable daily makes it a very attractive resource for generating electricity.

Why is solar-based distributed generation important?

Solar-based distributed generation is a significant tool of a future sustainable power sector. It improves the stability, efficiency, reliability, and profitability of distribution if it is placed optimally. If the distributed generation is not idealized, it can decrease the network's efficiency.

Is solar photovoltaics ready for the future?

Solar photovoltaics (PV) is a mature technology ready to contribute to this challenge. Throughout the last decade, a higher capacity of solar PV was installed globally than any other power-generation technology and cumulative capacity at the end of 2019 accounted for more than 600 GW.

Buildings account for a significant proportion of total energy consumption. The integration of renewable energy sources is essential to reducing energy demand and achieve sustainable building design. The use of ...

The recent developments toward high efficiency perovskite-silicon tandem cells indicate a bright future for solar power, ensuring solar continues to play a more prominent role in the global ...

To provide a truly widespread primary energy source, solar energy must be captured, converted, and stored in a cost-effective fashion. New developments in nanotechnology, biotechnology, and the materials and ...

The Future of Solar Energy considers only the two widely recognized classes of technologies for converting solar energy into electricity -- photovoltaics (PV) and concentrated solar power (CSP), sometimes called solar thermal) -- in their ...

The renewable energy sector has already achieved a remarkable milestone, accounting for 30% of the power generation mix in 2021, with solar photovoltaic and wind energy sources contributing ...

The rising demand for food and the unpredictable price of fossil fuels have led to the search for environmentally sustainable energy sources. Energy is one of the significant ...

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