

What is the progress made in solar power generation by PV technology?

**Highlights** This paper reviews the progress made in solar power generation by PV technology. Performance of solar PV array is strongly dependent on operating conditions. Manufacturing cost of solar power is still high as compared to conventional power. **Abstract**

Is solar thermal power generation better than solar PV?

In the world of renewable power generation technologies, solar thermal power generation faces stiff competition from solar PV and wind energy systems. The latter two systems are not just more technologically mature, but also cheaper than the former.

Is solar energy a good option for electricity generation?

Among renewable energy sources solar energy attract more attention and many studies have focused on using solar energy for electricity generation. Here, in this study, solar energy technologies are reviewed to find out the best option for electricity generation. Using solar energy to generate electricity can be done either directly and indirectly.

How has solar PV technology changed in 2022?

It is seen that the global weighted-average LCOE of solar PV technology reduced by about 89 % from 0.445 USD/kWh in 2010 to 0.049 USD/kWh in 2022. It is noticeable that the LCOE of PV technology has dropped into the range of fossil fuel electricity costs since 2014.

What is the future of solar energy?

Progress has been made to raise the efficiency of the PV solar cells that can now reach up to approximately 34.1% in multi-junction PV cells. Electricity generation from concentrated solar technologies has a promising future as well, especially the CSP, because of its high capacity, efficiency, and energy storage capability.

Are solar thermal power plants better than CSP-based power plants?

In addition, a comparison is made between solar thermal power plants and PV power generation plants. Based on published studies, PV-based systems are more suitable for small-scale power generation. They are also capable of generating more electricity in a specific area in comparison with CSP-based systems.

Thermal technology for energy generation may be split into four groups, according to the review: solar power tower, parabolic dish collector, parabolic trough collector, linear Fresnel reflector, and the parabolic dip is the ...

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In this paper, both methods of electricity generation are reviewed and compared. Based on published studies, PV-based systems are more suitable for small-scale power generation. They are also capable...

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In this paper, solar thermal technologies including solar trough collectors, linear Fresnel collectors, central tower systems, and solar parabolic dishes are comprehensively reviewed and barriers...

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Solar power generation is a sustainable and clean source of energy that has gained significant attention in recent years due to its potential to reduce greenhouse gas emissions and mitigate ...

Sun is the most abundant source of energy for earth. Naturally available solar energy falls on the surface of the earth at the rate of 120 petawatts, which means that the ...

The efficiency ( $\eta_{PV}$ ) of a solar PV system, indicating the ratio of converted solar energy into electrical energy, can be calculated using equation [10]: 
$$\eta_{PV} = P_{max} / P_{inc} \dots$$

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