

What is the future of solar energy?

Power generation by fossil-fuel resources has peaked, whilst solar energy is predicted to be at the vanguard of energy generation in the near future. Moreover, it is predicted that by 2050, the generation of solar energy will have increased to 48% due to economic and industrial growth [13,14].

How has solar energy generating capacity changed over the years?

Provided by the Springer Nature SharedIt content-sharing initiative Photovoltaic (PV) solar energy generating capacity has grown by 41 per cent per year since 2009¹. Energy system projections that mitigate climate change and aid universal energy access show a nearly ten-fold increase in PV solar energy generating capacity by 2040^{2,3}.

Is solar energy a future energy resource?

The utilization of renewable energy as a future energy resource is drawing significant attention worldwide. The contribution of solar energy (including concentrating solar power (CSP) and solar photovoltaic (PV) power) to global electricity production, as one form of renewable energy sources, is generally still low, at 3.6%.

What is the contribution of solar energy to global electricity production?

While the contribution of solar energy to global electricity production remains generally low at 3.6%, it has firmly established itself among other renewable energy technologies, comprising nearly 31% of the total installed renewable energy capacity in 2022 (IRENA, 2023).

Are solar photovoltaics ready to power a sustainable future?

Nat. Energy 3, 515–527 (2018). Victoria, M. et al. Solar photovoltaics is ready to power a sustainable future. Joule vol. 5 1041–1056 (Cell Press, 2021). Nemet, G. How solar energy became cheap: a model for low-carbon innovation. (Taylor & Francis, 2019). Rogers, E. Diffusion of Innovations. (Free Press, 2003). Farmer, J. D. & Lafond, F.

Is solar energy a renewable resource?

Solar energy is a widely distributed, sustainable, and renewable energy source. As a renewable resource, solar energy has the capability to replace the widely used fossil fuel resource in the near future.

In 2018, solar photovoltaic (PV) electricity generation saw a record 100 GW installation worldwide, representing almost half of all newly installed renewable power capacity, and surpassing all ...

International Journal of Photoenergy. Volume 2021 ... In order to simulate the working state of the residential trough solar photovoltaic power supply system, the same type ...

This paper proposes a model called X-LSTM-EO, which integrates explainable artificial intelligence (XAI), long short-term memory (LSTM), and equilibrium optimizer (EO) to reliably forecast solar power ...

To be specific, solar irradiation is the most essential climate condition for solar power generation, which also determine the economic performance of the solar power plants. ...

In the same context, technology to harness power from newer renewable energy resources has paved the way for a greener tomorrow. ... International Journal of Electrical and Electronic ...

To achieve the goals of carbon peak and carbon neutrality, Xinjiang, as an autonomous region in China with large energy reserves, should adjust its energy development and vigorously develop new energy sources, ...

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