# Pv power plant

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Learn how solar power plants work, what are the types of solar panels and systems, and what are the advantages and disadvantages of solar energy. This article expl...

Gonghe Talatan Solar Park (in Gonghe County, Qinghai, China) as the largest solar park in the world with a capacity of 15,600MW as of 2023 and a planning area of 609 km2, which is close to the land area of Singapore.[10]

As with other forms of power generation, there are important regional habitat modification problems, such as the heat island effect, and the resulting stress to local threatened species.[11] Several planned large facilities in the U.S. state of California have been downsized due in part to such concerns.[12][13]

These lists include a mixture of individual solar power plants and of groups of co-located projects, usually called solar parks.[14]

Maintaining a generation growth rate aligned with the Net Zero Scenario will require reaching annual capacity additions that are close to three times higher than those of 2022 until 2030. Achieving this will require continuous policy ambition and effort from both public and private stakeholders, especially in the areas of grid integration and in addressing policy, regulation and financing challenges.

Power generation from solar PV increased by a record 270 TWh in 2022, up by 26% on 2021. Solar PV accounted for 4.5% of total global electricity generation, and it remains the third largest renewable electricity technology behind hydropower and wind.

China was responsible for about 38% of solar PV generation growth in 2022, thanks to large capacity additions in 2021 and 2022. The second largest generation growth (a 17% share of the total) was recorded in the European Union, followed by the United States (15%). Solar PV proved to be resilient in the face of supply chain bottlenecks, high commodity prices and the increase in interest rates experienced in 2022, and achieved another record annual increase in capacity (220 GW). This should lead to further acceleration of electricity generation growth in 2023.

Reaching an annual solar PV generation level of approximately 8 300 TWh in 2030, in alignment with the Net Zero Scenario, up from the current 1 300 TWh, will require annual average generation growth of around 26% during 2023-2030. This rate is similar to the expansion recorded in 2022, but maintaining this momentum as the PV market grows will require continuous effort.

Utility-scale plants were responsible for about half of global solar PV capacity additions in 2022, followed by

distributed capacity in the commercial and industrial (25%) and residential (23%) segments. The share of utility-scale plants was at its lowest since 2012, as generous policy incentives drove record distributed PV capacity additions in China, Brazil, the United States and the European Union in 2020-2021.

In the context of high fuel and electricity prices in 2021-2022, distributed PV became an increasingly attractive alternative for many consumers, which has sparked investment. Utility-scale systems are the cheapest source of electricity generation in most parts of the world. However, building large-scale installations is becoming increasingly challenging in many countries due to the lack of suitable sites and complicated permitting procedures, which favours small-scale, rooftop PV systems.

Continuous support for all PV segments will be needed for annual solar PV capacity additions to increase to about 800 GW, in order to reach the more than 6 000 GW of total installed capacity in 2030 envisaged in the NZE Scenario. Distributed and utility-scale PV need to be developed in parallel, depending on each country"s potential and needs.

In 2022, global solar PV manufacturing capacity increased by over 70% to reach 450 GW for polysilicon and up to 640 GW for modules, with China accounting for more than 95% of new facilities throughout the supply chain.