

Requirements for land occupation of photovoltaic energy storage station

How much land area does a photovoltaic need?

We find that conventional photovoltaic will require 0.5 to 1.2% of global land area to meet projected energy demands by 2085 without accounting for climate change effects. When considering climate impacts, this requirement increases to 0.7-1.5% of the global land area.

Are utility-scale photovoltaic plants affecting land-use impacts?

Abstract--The rapid deployment of large numbers of utility-scale photovoltaic (PV) plants in the United States, combined with heightened expectations of future deployment, has raised concerns about land requirements and associated land-use impacts.

Can photovoltaic meet energy demands?

We investigate the potential of photovoltaic to satisfy energy demands given climate change and technological development. We find that conventional photovoltaic will require 0.5 to 1.2% of global land area to meet projected energy demands by 2085 without accounting for climate change effects.

Why is the scope of large-scale PV deployment limited?

Previous analyses have argued that the scope for large-scale PV deployment is limited because of competition with other land uses^{12,13}. Some land uses, however, are multifunctional, such as agri-voltaic systems¹⁴. Pastures are generally well-suited to agri-voltaic systems in which solar panels are placed above grazing livestock.

Can agrivoltaics reduce land-use impacts?

They ain't making any more of it."--Will Rogers and/or Mark Twain
While there are potentially other ways (such as "agrivoltaics") to mitigate the negative land-use impacts of utility-scale PV, the primary way to mitigate the inevitability of rising land costs is to minimize the amount of land needed to generate each MWh of solar energy

Can photovoltaics be used in degraded grasslands?

Zhang, B. et al. Deploying photovoltaic arrays in degraded grasslands is a promising win-win strategy for promoting grassland restoration and resolving land use conflicts. *J. Environ. Manag.* 349, 119495 (2024).
Nowak, A. et al. Ecovoltaics—a truly ecological and green source of renewable goods. *Ecol. Chem. Eng. S* 30, 315–332 (2023).

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