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Title: Requirements for land occupation of solar energy storage station

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Do solar and wind power have land-use requirements?

Rising shares of wind power and solar power in energy systems raises concerns over their land-use requirements (LURs) and associated impacts. Although abundant literature is available on LURs of solar and wind power, existing estimates exhibit a large variance, if not even inconsistency.

What are unused land use types of PV power stations?

According to field research, consultation, and literature review, the land use types of conventional ground PV power stations and agricultural PV power stations before construction are identified as unused land, namely bare land, barren mountains and slopes, saline-alkali land, and wasteland (Adeh et al., 2019).

How big are photovoltaic power stations?

The rapid expansion of photovoltaic (PV) power stations in recent years has been primarily driven by international renewable energy policies. Projections indicate that global PV installations have covered an area of 92000 km², equivalent to the entire land area of Portugal (Zhang et al., 2023b, Zhang et al., 2023c).

How much land does a large-scale PV system need?

Consequently, achieving maximum benefits from limited territorial space through large-scale PV development has become an inevitable trend. It is estimated that the direct land requirements for small and large PV installations range from 8.9 to 49.4 m² /kW, with a capacity-weighted average of 27.9 m² /kW (Marzouk, 2022).

The land-occupation ratio is the actual land occupation of PV cells over the total land occupation of solar photovoltaic power plants. This includes the space required around the modules to ...

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