Solar photovoltaic power generation and climate change

Here we evaluate climate change impacts on solar photovoltaic (PV) power in Europe using the recent EURO-CORDEX ensemble of high-resolution climate projections together with a PV...

Another aspect when investigating the effect of PV power generation systems on climate change is the albedo effect (Washington and Meehl, 1993). PV panels have a quite low reflectivity with an effective albedo of 0.18 to 0.23, hence, converting most of the solar insolation into heat, which in turn may have an effect on the climate (Kotak et al., 2015 ; Nemet, 2009 ; ...

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Climate change will have an important impact on the supply and demand of solar power generation (Craig et al., 2018; Hosseini-Fashami et al., 2019; Sawadogo et al., 2020, Sawadogo et al., 2020). Therefore, research on the influence of climate change on PV power potential is of great significance for solar energy policy formulation, and future PV industry ...

This study highlights the consequences of climate change on PV power generation variability, providing valuable insights for PV installation planning, especially for countries at higher latitudes.

This paper reviews the potential vulnerability of solar energy systems to future extreme event risks as a consequence of climate change. We describe the three main technologies likely to be used to harness sunlight--thermal heating, photovoltaic (PV), and concentrating solar power (CSP)--and identify critical climate vulnerabilities for each ...

This study assesses how cloudiness and weather variability, enhanced by climate change, will affect photovoltaic output, finding that conditions are likely to worsen by mid-century over the...

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Solar photovoltaics (PV) plays an essential role in decarbonizing the European energy system. However, climate change affects surface solar radiation and will therefore directly influence future PV power generation. We use scenarios from Phase 6 of the Coupled Model Intercomparison Project (CMIP6) for a mitigation

(SSP1-2.6) and a fossil-fuel ...

In this article we examine how projected changes in temperature and insolation over the 21st century will affect photovoltaic (PV) and concentrated solar power (CSP) output. Projected climate data was obtained from the coupled ocean-atmosphere climate models HadGEM1 and HadCM3 under the IPCC SRES A1B scenario which describes a future world of ...

However, solar power generation is sensitive to climate changes [4, 5], imposing a definite limitation on the stability of solar electricity supply [6]. For example, changes in the frequency of cloudy and rainy weathers can substantially affect PV power outputs. Therefore, quantifying the impact of climate change on the stability of solar energy is important for ...

A tipping point towards solar dominance however does not solve climate change mitigation or achieve climate targets, as it does not ensure a zero-carbon energy system. Solar-dominated electricity ...

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Solar power could provide a considerable contribution to the electricity production of almost all countries and regions in the study area. Although our results suggest little or no significant climate change impact on the solar resource, some uncertainties remain. However, it is possible to conclude that land-use changes will have a significant ...

Many solar photovoltaic (PV) energy projects are currently being planned and/or developed in West Africa to sustainably bridge the increasing gap between electricity demand and supply. However, climate change will likely affect solar power generation and the atmospheric factors that control it. For the first time, the state-of-the-art CMIP ...

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