



Impact of aerosols on PV power projections over Europe

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The evolution of different renewable energy resources under different climate change scenarios is a key factor for the energy industry and for the energy transition. The possible changes with respect to present conditions for the operating plants and the projected resources can affect the financial frame and viability of the projects.

Over Europe, climate models give a robust answer in terms of global warming and other important climate variables. However, GCMs and RCMs disagree in the projected changes of surface solar radiation (SSR) over Europe. Whereas global climate models, GCMs, present a clear positive signal for the end of XXI century, some studies show a negative anomaly for the same period in RCMs from EURO-CORDEX ensemble. This discrepancy is of special interest for photovoltaic (PV) power plants, whose resource is precisely solar radiation reaching earth's surface.

In this work, which is a contribution to the CORDEX FPS-aerosols, we try to explain the reasons of the difference in anomalies focusing on the representation of aerosols in the scenario simulations of RCMs. We use regional climate models simulations from the EURO-CORDEX ensemble grouped together by its forcing GCM. Different families of runs are analysed with only one simulation with evolving aerosols per group. We focus on RCP8.5 emissions scenario. In addition, a detailed PV model is used to estimate future PV potential over Europe, which has not been considered in previous approaches.

Results of this study will lead to the obtention of more accurate PV projections over Europe, demanded by policymakers and the energy sector.