Potential impact of climate change on solar resource in Africa for photovoltaic energy: analyses from CORDEX-AFRICA climate experiments

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The development of renewable electricity in Africa could be massive in coming decades, as a response to the rapid rising electricity demand while complying with the Paris Agreements. This study shows that in the high-resolution climate experiments of CORDEX-AFRICA, the annual mean solar potential is expected to decrease on average by 4\% over most of the continent by the end of the century, reaching up to 6\% over the Horn of Africa, as a direct result of decrease in solar radiation and increase in air surface temperature. These projections are associated with large uncertainties, in particular over the Sahel and the elevated terrains of eastern Africa. While the expected decrease may affect the sizing of the numerous solar projects planned in Africa for the next decades, this study suggests that it does not endanger their viability. At last, this study indicates that the design of such projects also needs to account for the non-negligible uncertainties associated with the resource.