Future projections of photovoltaic power generation on climate change simulated by CORDEX II multi-RCMs over East Asia

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East Asia is a highly industrialized region with high CO2 emissions from fossil fuel use. Therefore, to achieve the goal of the Paris Agreement on CO2 reduction, an increase in the production of renewable energy such as photovoltaic (PV) and wind power generation is required in this region. Most renewable energy production is directly affected by weather and climate. This study projected changes in future PV power generation and climate variables affecting them using CORDEX phase 2 RCMs with 25km horizontal resolution forced by HadGEM2-AO GCM over East Asia. The present change and future projection of PV potential production (PVpot) depend critically on changes in surface-downwelling shortwave radiation (RSDS). In the analysis of recent changes in PVpot over East Asia using the ERA5 reanalysis data, PVpot overall increased slightly. For PVpot projections using the high-emission scenario during the late 21C, RegCM4 is expected to increase, while the other RCMs will decrease. The results of this study will help to develop policies for efficient future production of renewable energy over East Asia by presenting the projection of future photovoltaic power generation on a detailed regional scale.