Geophysical Research Abstracts
Vol. 12, EGU2010-13003, 2010
EGU General Assembly 2010

Climate change impact on renewable energy sources during the 21st century over France

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The impact of climate change on three types of green electricity production over France, wind, hydro and solar energies, is studied through the evolution of related climate variables during the 21st century. Climate projections of these variables, obtained from the IPCC model database, are downscaled to higher resolution grids (25 km for solar radiation and 50 km for precipitation) and a wind farm network. The statistical downscaling method used here is based on the matching of large and local scale cumulative density functions. Models are forced by three greenhouse gas emission scenarios, SRESA2, SRESA1B and SRESB1. For each of these scenarios, the downscaling outputs are combined using a Bayesian model merging approach. Results are shown for two periods, 2046-2065 and 2081-2100.