



Estimating expected change of wind speed and solar radiation in the Carpathian basin using fine resolution regional climate models

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Spatial resolution of global climate models (GCMs) are inappropriate to describe regional climate processes; therefore, GCM outputs may be misleading to compose regional climate change scenarios for the 21st century. In order to provide better estimations for regional climate parameters, fine resolution regional climate models (RCM) can be used. RCMs are limited area models nested in GCMs, i.e., the initial and the boundary conditions of RCMs are provided by the GCM outputs. In order to estimate the regional climate change expected in the Carpathian basin, outputs from several RCMs are summarized and analyzed for the periods of 2071-2100 (in case of A2 and B2 emission scenarios) and 1961-1990 (representing the current baseline climatic conditions). The RCM output variables with 50 km resolution horizontal are available from the completed European project PRUDENCE (Prediction of Regional scenarios and Uncertainties for Defining European Climate change risks and Effects).

Wind speed and solar radiation are both important meteorological parameters in terms of renewable energy potentials. The results suggest that in the Carpathian basin wind speed is likely to increase in all months by the end of the 21st century in case of both scenarios, which increases the wind energy potential in the region. Solar radiation is projected to increase in the summer half-year, and slightly decrease in winter. Thus, solar energy use during summer may become a more efficient renewable source in the future.