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Wind speed and global radiation from the regional reanalysis COSMO-REA6 for applications in the energy sector

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The regional reanalysis COSMO-REA6 provides data from 1995 onwards, covering the European CORDEX domain. Because of the high spatial and temporal resolution (about 6km and an hourly time step) the data set exhibits a great potential in the field of renewable energy applications. One aspect of the German joint research project "Network of Experts" within the Ministry of Transport and Digital Infrastructure is the investigation of energy production by solar and wind with a focus on the transportation infrastructure. Here we show how to use regional reanalysis data for this question. We will present estimations of data quality, concerning wind speed and global radiation. In order to highlight advantages and disadvantages of the COSMO-REA6 product we compare the reanalysis data with different data sources, including station observations from the German station network, satellite based data sets and also gridded products, developed at Germany's national meteorological service DWD. Analyses of the mean square error, the bias and the correlation, extended to other commonly used skill scores are presented here, to show the spatial and time scale dependencies. First results show that the averaged bias over all observed German stations reaches a value of -0.23 m/s, while the global radiation shows a bias of -5.37 W/m̂2 over Europe, compared to satellite data. Regional differences are highlighted as well, concerning mountainous and coastal areas. While COSMO-REA6 shows good results for the German coasts there are high discrepancies between reanalysis and observations for complex terrains. Latter are mainly explained by high differences between modeled and real orography.