



Analysis of the balancing of the wind and solar energy resources in Andalusia (Southern Spain)

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A higher penetration of the renewable energy in the electric system in the future will be conditioned to a reduction of the uncertainty of the yield. A way to obtain this goal is to analyze the balancing between the productions of different sources of renewable energy, trying to combine these productions. In this work we analyze, from a meteorological point of view, the balancing between wind and solar energy resources in Andalusia (southern Iberian Peninsula). To this end, wind speed and global radiation data corresponding to an one year integration of the Weather Research and Forecasting (WRF) Numerical Weather Prediction (NWP) model were analyzed. Two method of analysis were used: a point correlation analysis and a Canonical Correlation Analysis (CCA). Results from these analyses allow obtaining, eventually, areas of local and distributed balancing between the wind and solar energy resources. The analysis was carried out separately for the different seasons of the year. Results showed, overall, a considerable balancing effect between the wind and solar resources in the mountain areas of the interior of the region, along the coast of the central part of the region and, specially, in the coastal area near the Gibraltar strait. Nevertheless, considerable differences were found between the seasons of the year, which may lead to compensating effects. Autumn proved to be the season with the most significant results.