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Offshore wind potential over the Iberian Peninsula simulated by the COSMO-CLM regional model

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Global warming and climate change, together with increasing energy demand, shortage of fossil fuel reserves and rising oil prices motivate the increased development of renewable energies, including wind energy. In particular, offshore wind power generation may have significant future viability since it is widely distributed across the globe, its GHG emissions are residual and due to its apparent lower economic, environmental and social effects. This study aims at evaluating the potential of the offshore wind resource for the Iberian Peninsula, using simulations from the regional climate model COSMO-CLM, with spatial resolution of approximately 20 km. The model was driven by ERA-40 reanalysis for the recent past period (1961-2000) and was driven by ECHAM5 (global climate model) under future climatic conditions (2041-2070; SRES A1B scenario). To estimate the wind potential energy an offshore wind turbine Vestas V80-2.0 MW is considered. The analysis is performed on the Iberian Peninsula coastal areas, which are further divided into four sectors: Cantabrian, Atlantic, South Atlantic and the Mediterranean coasts. Results reveal that areas showing the greatest potential for energy production are the western and northern coasts of the Iberian Peninsula, with special emphasis on the Portuguese coast. The climate change projections suggest a decrease in the wind energy potential over most of the studied areas. Nevertheless it is worth mentioning that these values remain always higher than the onshore wind energy potential on Iberia.

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