



Intercomparison of wind speeds from multiple reanalyses and an evaluation using tall tower observations

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Tailored climate services for the energy sector have recently gained popularity with the advent of renewable energy that heavily depends on weather and climate phenomena to generate electricity. Climate services inform stakeholders about variability and risks in future resource availability. For instance, seasonal variability of wind speed directly affects electricity generation of wind farms. This works as a major barrier to renewable energy integration into the electricity systems, which has implications for owner companies, grid operators, maintenance teams, plant investors and energy traders. Recent advances in science and technology has significantly contributed to the ability to forecast climate variability and extremes over the coming weeks, seasons, years or decades.

In order to assess the quality of these forecasts it is essential to have a clear picture of the past variability. This is routinely done with reanalysis datasets, which provide gridded observational estimates at global scale. In this work, a comprehensive intercomparison of surface wind speed from several global reanalyses will be done. This includes a characterisation of the differences in climatology, trends and variability. The merits of different reanalyses such as ECMWF ERA-Interim and ERA5, as well as JMA JRA-55, NCEP/NCAR reanalysis and MERRA-2 reanalysis will be compared. Moreover, a comparison of wind speeds at heights above 10 meters with on-site observations from tall towers will be performed. This work will be used to select the most suitable dataset for the evaluation and bias adjustment of operational forecasts that will be issued within the S2S4E (H2020) project.