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Seasonal forecasts for the wind power industry within the CLIM4ENERGY project

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Seasonal forecasts can be of great help for the management of wind farms. Information on wind speed and power generation in the coming months can be of interest to multiple stakeholders: operations and maintenance teams need to work on certain weather conditions for their security and also for minimizing lost production due to turbine stoppings. An early forecast can help them to schedule operations during the less windy periods. For grid operators, being aware in advance of the amount of renewable energy that will go into the grid can help to schedule traditional power plant operations. For the financial teams running the wind farm business, having a budget of the energy they will produce in the coming months is of crucial importance to anticipate cash flow.

Copernicus is an EU programme for monitoring the Earth using satellite, in-situ observations as well as numerical modeling systems. It covers a wide range of topics from atmosphere, land or oceans, to climate change. As part of it, the Copernicus Climate Change Service (C3S), run by ECMWF, will deliver seasonal forecasts to the general public. CLIM4ENERGY is a proof-of-concept project subcontracted by C3S. It aims to produce tailored forecasts that can be useful for the energy sector. Barcelona Supercomputing Center is leading work package 1, that focuses on providing climatic information impacting wind power generation (seasonal predictions and climate projections).

A pre-operational system will be designed, using ECMWF system 4 model, together with an assessment of the regions where this model forecasts are skillful compared to climatology. The most relevant model output variables for wind power generation have to be selected, and calibration methods need to be applied to correct biases and obtain reliable forecasts. Moreover, extreme values will be provided, and the impact of different weather types will be studied. The forecasts will be evaluated with wind farm data provided by industrial partners, that also will help to define industry needs and shape the visualisation tools.