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Renewable energy production forecasts within the ORKA project

Regina Kohlhepp, Jonas von Schumann, and Michael Buchhold
Deutscher Wetterdienst (DWD), Offenbach am Main, Germany (Regina.Kohlhepp@dwd.de)

The proportion of renewable energy input in the German power grid is increasing continuously. As a result, good forecasts of renewable energy production start to become essential, for traders on the one hand, but especially also for power grid operators because grid stability may be concerned.
The ORKA project brings together the German Weather Service (DWD), the power forecaster energy & meteo systems, and distribution and transmission system operators. They aim to improve the complete forecasting chain for renewable energy production, especially in order to ensure grid stability, thereby focussing on solar and wind energy power. The first part in the forecasting chain are the meteorological models. In the present project, the convection-resolving deterministic and probabilistic versions of the COSMO model at DWD are evaluated and subsequently improved concerning the forecasts of solar radiation and wind at hub height. The next step are the power forecasts which, amongst other information, use the meteorological forecasts as input. These power forecasts can be improved for example by increasing their spatial resolution in order to be able to detect risks for local grid instabilities. Introducing the idea of ensemble simulations is also a very important aspect when trying to improve the reliability of the grid stability calculations.
This presentation shows the achievements of the ORKA project, which will end in December 2015, with a focus on the improvements in meteorological forecasts of solar radiation and wind speed at hub height. Experiments with a stability-dependency of the minimum turbulent diffusion coefficient will be discussed, aiming at a better representation of low-level stratus clouds in the COSMO-DE model. In addition, improvements of the ensemble generation procedure in COSMO-DE-EPS with respect to radiation and wind are presented.