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Weather Information Tailored to the Needs of Renewable Energy Industry

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By introducing the Renewable Energy Sources Act (EEG), the German government is actively promoting the role of renewable energies in the electric energy supply. In this context, reliable forecasts became indispensable for a safe and efficient integration of the increasing share of the variable power production from wind farms and photovoltaic power stations into the grid. For the safety of power grids, extreme errors in the power forecasts are critical. These errors are often connected with certain weather conditions: for example frontal passages connected with severe wind conditions or high pressure systems in connection with fog or low stratus. This topic is also considered in the German research project EWeLiNE, which brings together researchers from the DWD (Deutscher Wetterdienst) and Fraunhofer IWES, as well as three German Transmission System Operators (TSOs). One objective of the project is to improve the NWP forecast chain of DWD. Research is also conducted on linking large and critical power forecast errors to specific weather situations. Detecting critical situations in NWP forecasts potentially allows the TSOs to react and prepare themselves well in advance.
Besides providing optimized forecasts, a strong focus is put on the development of user specified products. For this reason, a close collaboration is being established to strengthen the dialog between meteorology and the energy sector. The project is planned and carried out in close cooperation with the involved TSOs in order to ensure the usability of the developed products. The project includes a demonstration phase, in which the optimized models and newly developed products are combined into a process chain and used to provide information to TSOs in a real-time decision support tool. The use of a web-based development platform enables short development cycle and agile adaptation to evolving user needs.
This contribution will present recent developments within the EWeLiNE project and discuss examples on how to incorporate (probabilistic) weather information into the users' current decision making processes with respect to severe weather events.