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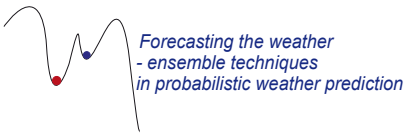

WIRE: Weather Intelligence for Renewable Energies

A. Heimo, R. Cattin, B. Calpini, and A. M. Sempreviva
Meteotest, Bern, Switzerland (alain.heimo@meteotest.ch)

Renewable energies such as wind and solar energy will play an important, even decisive role in order to mitigate and adapt to the projected dramatic consequences to our society and environment caused by climate change. Due to shrinking fossil resources, the transition to more and more renewable energy shares is unavoidable. But, as wind and solar energy are strongly dependent on highly variable weather processes, increased penetration rates will also lead to strong fluctuations in the electricity grid which need to be balanced. Therefore, it is today appropriate to scientifically address the requirements to provide the best possible specific weather information for forecasting the energy production of wind and solar power plants within the next minutes up to several days. Weather Intelligence in the sense of specific accurate forecasting of 'energy weather' is a key component for this.

Towards such aims, Weather Intelligence will first include improving dedicated post-processing algorithms coupled with weather prediction models and with past and/or online measurement data especially remote sensing observations. Second, it will contribute to investigate the difficult relationship between the highly intermittent weather dependent power production and concurrent capacities such as transport and distribution of this energy to the end users.

Concerning the first goal, selecting, resp. developing surface-based and satellite remote sensing techniques well adapted to supply relevant information to the specific post-processing algorithms for solar and wind energy production short-term forecasts is a major task with big potential. It will lead to improved energy forecasts and help to increase the efficiency of the renewable energy productions while contributing to improve the management and presumably the design of the energy grids in the future.

The second goal will raise new challenges requiring input from two different communities: from the energy producers and distributors, definitions of the requested input data and introduction of new technologies dedicated to the management of power plants and electricity grids; from the meteorological community to deliver suitable, short term high quality forecasts to fulfill these requests with emphasis on highly variable weather conditions and spatially distributed energy productions often located in complex terrain.

This topic has been selected for a new COST Action ES1002 under the title "Weather Intelligence for Renewable Energies" which has started November 2010 for a duration of 4 years. The present paper will reflect the first steps towards the establishment of a "State-of-the-Art" report due to be published at the end of 2011, and in particular the results of the "State-of-the-Art" Workshop which took place in March 2011 in Nice, France.