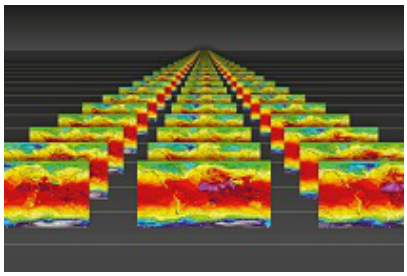

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Understanding skill in probabilistic predictions of system-wide wind power generation in Great Britain

The growing use of weather-dependent renewable power is changing the way electricity systems operate. The traditional paradigm –where large power plants are managed to meet variations in electricity demand – is being replaced by a situation in which demand and supply are strongly influenced by weather. This has profound consequences for power systems where supply-demand balance must be maintained in real time, and the need for high-quality meteorological information to manage risk across all timescales has never been greater. Despite this, NWP output is often not evaluated in explicitly 'power system'terms.

Recent developments in weather and climate science offer opportunities but also raise challenges for how we understand, model and quantify meteorological impacts on complex systems. This presentation will focus on the conversion of meteorological inputs into power system properties, with the utility of probabilistic forecasts shown to depend on the nature of the power system property being forecast: e.g., extreme wind ramps are typically less predictable than total wind power output by 1-2 days. The contribution of the various sources of uncertainty at different forecast lead times is analysed (downscaling/calibration vs. synoptic evolution), and the importance of considering ensembles of complete forecast trajectories rather than point-forecasts or ensemble-means discussed.

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