



Predictability of the weather patterns that cause extreme electricity demand in the UK

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Electricity systems are designed to ensure extreme demand periods can be met. There is consequently much interest in the conditions that lead to extreme demand. In addition, given the implications of extreme demand periods on the management and economics of the system, predicting the likelihood of such events in advance is advantageous. This research therefore aims to establish the weather patterns that are associated with extreme electricity demand in the UK and to assess the current skill in predicting their occurrence over the coming month or season.

The weather patterns that cause extreme electricity demand have been established by applying K-means clustering to the mean sea level pressure fields of the top 5% of electricity demand days over the period 1979-2013. We find that a small number of different high pressure weather patterns predominantly generate the cold UK temperatures which lead to extreme electricity demand.

The skill of the Met Office monthly to seasonal forecasting system (GloSea5) in predicting the frequency of such weather patterns will be presented. We assess the predictability over the winter period (December, January, February), both for individual months and as a seasonal mean, with a one month lead time. This assessment is based on the 23 year hindcast set currently available.