



Low frequency variability of European weather patterns and its impact on power generation in northern Europe

Giacomo Masato (1) and Georgi Slavov (2)

(1) Marex Spectron, London, United Kingdom, (2) Marex Spectron, London, United Kingdom

It is well known that Europe is becoming increasingly reliant on the power generation from the solar and wind sources. Germany is a leader in such a trend - it is then interesting to study to what extent the low-frequency variability of the European weather patterns impacts the power production in this country. Rather than identifying such patterns starting from the weather angle, four weather regimes are identified that maximize and minimize the production of solar and wind power. The analysis of their past occurrence and trends allows us to estimate the potential amount of energy produced for any given year (assuming a constant installed capacity). It is found that the sole change in such weather regimes over the recent years is able to drive up to a 20% annual difference in power generation. This also throws an interesting challenge at the scientific community, whereby the future projection of these regimes can heavily influence both the short- and long-term Eurozone plans in terms of European renewable energy targets.