

Wind Energ. Sci. Discuss., community comment CC1
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Comment on wes-2022-48

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Community comment on "Predicting power ramps from joint distributions of future wind speeds" by Thomas Muschinski et al., Wind Energ. Sci. Discuss.,
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This article addresses a timely issue in energy forecasting, is well written and an interesting read.

The proposed approaches are reasonable and it is very nice to have a comparison between modelling temporal correlation and the elements of the Cholesky decomposition. The former has nice links to previous work on modelling wind speed and power using varying coefficient time series models, and the more recent and more general approach proposed in [J. Browell, C. Gilbert and M. Fasiolo, "Covariance Structures for High-dimensional Energy Forecasting", XXII Power Systems Computation Conference, 2022, and Electric Power Systems Research]. The latter has the benefit of additional flexibility, but I find it much more difficult to interpret the elements of the Cholesky decomposition - can you offer any insight into this?

The results are compelling, and the ramp-based forecast evaluation is very useful. I do wonder if looking at additional multivariate scoring rules would provide further insight into the differences in performance of the ensemble forecasts, similarly rank histograms may also help verify the correctness (or not) of temporal dependency structures. On a related issue, how can we tell if the difference in forecast performance is due to genuinely more accurate dependency modelling, or if covariance models correcting deficiencies in the marginal predictive distributions?

Regarding the wind power evaluation, the power curve applied is that of an individual turbine and has a very sharp cut-out characteristic, but in reality wind farms do not exhibit this property and it is usual to see a smooth cut-out characteristic. This is especially true when considering hourly wind speed rather than the (approximately) instantaneous wind speed that manufacturer power curved as based on. How sensitive are

results to this?

In several equations pseudo code is mixed with mathematical symbols. I think it would be clearer and improve readability if only mathematical symbols were used.