

Interactive comment on “Comparison of electrical collection topologies for multi-rotor wind turbines” by Paul Pirrie et al.

Anonymous Referee #2

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This is generally an interesting topic. The research is entirely, especially now that MRWT is gaining attention. This study will provide the much needed insight into MRWT electrical system topologies and associated considerations. The manuscript is written and structured very well, apart from some occasional typos. However, there are some minor issues that need to be addressed before the paper is published.

1. Abstract: Although the abstract is well written, it would be good to provide some concluding remarks on findings from this research.
2. Introduction: P 2, Linen 41: It would be beneficial to provide further explanation on the relationship between “smoother load profile over MRWT structure” and the fatigue of MRWT. Line 41 – 43: In addition, the claim that “Various studies performed at Kyushu University in Japan (Göltenbott et al., 2017; Ohya et al., 2017; Goeltenbott et

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al., 2015) have shown that clustering turbines together can improve their performance” needs to be more specific in the context of this paper by stating the actual performance components that has been enhanced. P3, Line 64: Typo – Section 2 “describes” ...

3. Design constraints: It would be most appropriate if the properties of the models used in this study (10MW and MRWT) are summarised in a table for clarity. Lines 98 – 100: there appears to be something missing in “diameter or 41 m. ...”. Please crosscheck. Again, these values are best presented in a table and they should be supported with reference(s). Notwithstanding the assumptions made, could provide some details on the platform? This is important even if does not support the transformers/ converters.

4. Proposed electrical topology designs: The authors have based some assumptions on the topology design on common offshore collection network. Does this mean that this method is applicable to offshore MRWT concept? If yes, how does it handle the effect of offshore environment on each topology? Also, going by the assumption that the “base of the structure”, which I assume is the foundation; since offshore environment may not have space to accommodate the transformer/converter at the “base of the structure”, what impact will this have on these topologies?

A graphic illustration of the platform, rather the textual description, showing the electrical component is recommended. It would good if you could provide recommendations on how to mitigate the noted disadvantages of each cluster topology or otherwise.

5. Cost, Mass and Loss Estimation: Typo in Line 178, ...include “the” ... Costs estimate has been presented in Table 1 without stating the type of wind turbine for which it applies. Please clarify. There are some inconsistencies in the use of units. Please check carefully.

Gearbox rpm: You may need to update your speed regime classification. Typically, 1. Slow-Speed: rated speed less than 400 rpm. 2. Medium Speed: rated speed of 400 rpm to 1200 rpm. 3. High-Speed: rated speed of 1200 rpm or more.

Power electronic converter: Although the estimation of converter mass shows a linear scaling relationship for LV - BTB converters, but this relationship is only limited to low power ratings. Any thought how this would affect the topologies performance and its commercial viability?

Cables (Line 236): Cable damage is a common occurrence in offshore environment; there is need to consider this in the topology design if this study is to be applied of offshore MRWT.

Transformers (Line 248): There is high inconsistent use of units in this section. Please crosscheck all units carefully.

6. The conclusions should be improved to include summary of key findings and their impact on MRWT. Although a good investigation of the various components of electrical topologies design have been undertaken, the results have not been completely validated in terms of their optimal values and their impact on the overall performance on MRWT. It is suggested that the authors should consider this doing it

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