Comment on wes-2021-123
Jørgen Hansen (Referee)

Referee comment on "Artificial hard substrate colonisation in the offshore Hywind Scotland Pilot Park" by Rikard Karlsson et al., Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2021-123-RC2, 2022

Review of Karlsson et al. 2021

Dear Editor,

I have now reviewed the manuscript "Artificial hard substrate colonization in the offshore Hywind Scotland pilot park". It is a study of the epifaunal colonization on the first floating windfarm "Hywind Scotland Pilot park" off Peters Head, Scotland. The methodology is based on underwater video recording using a ROV. The epifaunal community composition was analyzed on different parts of the floating structures together with anchors and with this high number of replicated observations, the authors describe the epifauna community composition, its depth zonation and discuss the similarity with other conventional windfarms and natural substrates in the area. The succession of the community is described from comparison between 2018 to 2020. The comparison between natural substrates and artificial substrates on other types of wind farms is important and relevant. However, the overarching problem is that these comparisons and generalizations in many cases are not supported by data, by the selection of data and the subsequent analyses as exemplified I the specific comments below. Critical information on methods, data and data analyses are missing in the MS.

As a conclusion publication of the manuscript cannot be recommended without major revision. I would also urge the authors to reconsider the focus of the MS and instead focusing on the observations (which should be documented in more details) and omit comparison if available data from natural substrates and other windfarms are not comparable. The below points may hopefully help identifying the weaknesses with the data presentation and analysis in order to revise the MS.

Specific comments

- 26-34 This an important issue and it would strengthen the point if more citations could be added here especially those from other than the industry
- 74 – 75 please specify distance to the structure or give a least a range
68 misspelling of WROV
86 colonization refer to a process – shouldn´t it be more specific like “coverage” or “state of colonization”?
93 please explain why nudibranchs and gastropods were excluded how did you overall selected your list and what was the rationale?
97-98 wasn´t the data secured such that the same person could compare and analyze the data later to insure more comparable data in 2018 and 2020?
104. I would like to see the species list! I failed to find it in results or reference to an appendix!
107. Same as above “different species of crustacean”!
111. I would think the term “percent coverage” is better
112. Although -tidal depth ranges are well defined terms I find it a little bit odd to use these depth categories in relation to floating structures where indeed the organisms do not experience the consequences of tides (e.g. the Kelp is not exposed to diurnal desiccation, changing light levels etc.) I Suggest to use depth ranges in meters instead
130 Laminaria belong to the group of Phaeohyceae – should maybe be “Laminaria and other Phaeophyceae”
144 “no significant differences were noted on the mooring lines…” This is a statement that should certainly be substantiated with additional information. What parameter did you look at (e.g. communities, coverage, biomass, individual species, biodiversity indices...)? What was your data format? test used … etc.

I 168-172. This part is not clear. The part about the coverage is clear but information on how you have distinguished between soft and hard fauna is missing (what species belongs to which groups) especially since the 2018 survey was performed by non-specialist. How was thickness determined from the underwater video film? Again bear in mind, that although this can easily be done by non-specialist, data is still subjective and the data quality could therefore be improved if the same person did both year (whether specialist or not). Legends on figure 7 an 8 missing information about the years and how changes is defied (2018 vs 2020?).

175. Subheading should rather be “identification of species” as no non-indigenous species in fact was determined with certainty
176 – 178 should be under results!
193 - 197 This is a potential important finding, due to the threatened status of Desmophyllum, and I would recommend to contact external experts as you did with the Barnacles. A strong group I located just around the corner at Edinburg University.
215-216. If diversity “is lacking” there is either 0 or 1 species present! Better to write whether there was fauna at all. Did you quantify species richness or diversity at all? In case this should be described under methods and results. Better to delete this sentence

L224 similar in what way?
L233. What do you mean by “not significant enough” if no statistical analysis was performed write instead “differences was not clear”

235 Different I what way?
239-241 How can you conclude the species succession follow the same trend as you have stated in the material and methods that only a few phyla was recorded by the non-specialists. Species succession implies that the relative contribution species to the
community changes over time.

- 251 the information about the uncertain due to lack of consistent methodology should (as mentioned in the above several times) should be flagged up front in MS and it also concerns the above comments on succession.