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Comment on wes-2021-47

Andrew P. J. Stanley

Community comment on "A framework for simultaneous design of wind turbines and cable layout in offshore wind" by Juan-Andrés Pérez-Rúa and Nicolaos Antonio Cutululis, Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-47-CC1>, 2021

Review

Title: "A Framework for Simultaneous Design of Wind Turbines and Cable Layout in Offshore Wind"

Authors: Juan-Andrés Pérez-Rúa and Nicolaos A. Cutululis

Journal: Wind Energy Science

Reviewer: Andrew P. J. Stanley – pj.stanley@nrel.gov

First let me say this was a pleasure to read, and very interesting. I think this is an area where significant improvements can be made, and I think a heuristic like the one presented in this paper is a great way to approach the problem. The comments I have are relatively minor, but I hope can improve the presentation of this research.

Specific Comments:

First, in the literature review I think you should mention the paper "Wind plant system engineering through optimization of layout and yaw control" by Fleming et al. This paper focuses yaw control and layout optimization, but they make cabling considerations in the layout optimization.

Second, in the results I would like to see the correlation between AEP and cabling cost. There are several ways this could be presented, but I'm imagining a figure or figures like 9 and 10, which shows the AEP vs average length between wind turbines and/or AEP vs the costs from the global optimizer. I think this is important to show the reader and will help explain some of the results you talk about later.

Third, I think you should discuss some you expect the results to change as your

parameters change. For example, as energy prices increase, you'd expect the optimizer to favor AEP more heavily, as distance from shore increases you would expect... The results for this paper are very interesting and sufficient to demonstrate your method, but I think this is important to discuss because you have only provided results for one set of parameters.

Technical Corrections:

Line 245: "Subsequently, the IRR metric may weight out more the AEP..." - This sounds off. Probably a good idea to reword.

Line 282: I don't think this necessarily guarantees there is no overlap between turbines and the OSS. What if the 4 turbines nearest the centroid were not arranged in a square? Like, a triangle with one in the middle but still meeting minimum spacing constraints?

Figure 8 (or anywhere talking about the resource): It's worth mentioning the number of wind speed bins you used.

Line 322: "trough" - typo

Line 335: "The main takeaway..." - I would reword this sentence, it's hard to follow.