Wind Energ. Sci. Discuss., author comment AC1
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Reply on CC1

Tanvi Gupta and Somnath Baidya Roy

Author comment on "Recovery processes in a large offshore wind farm" by Tanvi Gupta and Somnath Baidya Roy, Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2021-7-AC1, 2021

Thanks for the comment and for bringing the paper to our notice. The major differences between the studies that lead to the contrasting results are:

Response for Comment 1): For the analysis, Antonini and Calderia (2021) have solved an infinite wind farm in a 50X50 km^2 region, with turbines at each and every grid point and double periodic domain. The finding that the energy is supplied by the atmospheric pressure gradient within the boundary layer instead of the free troposphere is only valid for an infinite wind farm as designed under idealised conditions using the model WRF. We understand that in this kind of model set-up there is no space in the model domain around the wind farm for mesoscale circulations to develop that in turn help in recovery in the wind farm. We will include this aspect with reference to Antonini and Calderia (2021) in our revised version.

Response for Comment 2): Table 1 in our paper shows power generation over the wind farm (GW) averaged over two days of time-period. If we divide it by wind farm area (2500 km^2) and convert it to Wm^{-2}, we get a maximum value of 9.66 Wm^{-2} (Case C-I) and a minimum value of 0.21 Wm^{-2} (Case A-III). However, these values are not comparable with the framework given in the mentioned paper as the paper provides an annual mean of wind power density whereas our paper gives an estimate for only 48 hours.