We thank the reviewer for his/her time and efforts in carefully reading our manuscript. The feedback on our work is highly appreciated!

A point-by-point reply to the individual comments can be found below in blue (the original comments are included in black).

This paper investigates the energy production and wake losses of multi-gigawatt offshore wind farms using the LES approach. I like the research idea and the approach of using GPU to perform LES simulations with real atmospheric-driven forcings. I would support publication after the authors addressing these minor comments.

- Line 212: Please make a table showing the total number of wind turbines for each wind farm scenarios (Figure 3).

The number of wind turbine for each scenario is included in Table 1

- Figure 5: Can the authors better explain how they calculate the free-stream production and the actual production? I would imagine the free-steam production (Figure 5a) of the first 4 scenarios to be 42TWh. However, the figure only shows about half of that magnitude.

Free-stream of gross production is the production that would occur in the absence of wake and blockage effect but with taking into account the actual wind speed distribution. As the ambient wind speed is frequently lower than the rated wind speed of the turbines, the free-stream production is considerably lower than the production based on the rated capacity of 4GW (for the first 4 scenarios a rated production would amount to 4.2GW x (24 x 365)h = 37TWh). In contrast, the free-stream production is lower, namely around 22TWh

- I would assume that the layout of the wind farm would have a substantial impact on the power production and the aerodynamic loss (Figure3). Do the authors find any significant differences in the result between scenario 6 and the rest.

The differences in terms of overall (year-round) aerodynamic losses are small. When considering dependence on wind direction a clear impact is seen, see Section 4.4 ‘Directional effects’

- Why are the turbine spacings in these scenarios different (Table1). Shouldn’t the authors just change the wind turbine type while keeping everything else the same?

This depends on the research question that is to be answered. In our case we keep the total capacity (4GW) and the installed capacity density (10 MW/km2) the same. This implies that when the turbine type and/or the number of turbines is changed also the spacing in term of rotor diameter may become different.