On the Impact of Considering Power Losses in Offshore Wind Farm Cable Routing

Wind energy is a field of main importance in the transition away from fossil fuels. In order to achieve this goal, reducing production cost of wind energy is of primary importance, especially for offshore wind parks. In the present paper we illustrate optimization models to achieve this goal for the cable routing problem. In particular we focus on the economical impact of considering power losses in the optimization. The resulting optimization problem considers both minimizing immediate costs (CAPEX) and minimizing costs due to power losses in the park lifetime. Thanks to the close collaboration with a leading energy company, we have been able to conduct different what-if analyses on a set of existing wind parks. Having a fast and reliable tool to optimize cable routing considering or not power losses, we have been able, for the first time, to quantify the impact of these kinds of decisions at design phase. Our results illustrates the importance of considering power losses already at the design phase, as well as the importance of having a sophisticated optimization tool, compared with the traditional manual design.