

Loads and power changes due to vortex generators on a Vestas V52 wind turbine

Executive summary

Measurements and computations on the Vestas V52 850kW wind turbine have been carried out and comparisons are made¹. Vortex Generators (VGs) were installed on the wind turbine in a rather aggressive layout to be able to observe a response in the loads. Leading Edge Roughness (LER) was added as well in some of the configurations. The aerodynamic tool Power Pack was used to determine the layout of vortex generators on the blades and it was used to predict the performance of a wind turbine with and without vortex generators and with and without leading edge roughness. Furthermore, the measured wind turbine performance and the performance predicted by the Power Pack tool was compared. The results were supported by further predictions using the state-of-the-art aeroelastic tool HAWC2.

The analysis showed that the load predictions on the Vestas V52 turbine with the dedicated design tool Power Pack were made with an accuracy of between 98.2% and 99.9%. With respect to the measured and simulated change in the Annual Energy Production (AEP), the AEP was predicted within 99.5% accuracy, with some uncertainty connected to this conclusion.



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