

FINO 1 Platform: Update of the Offshore Wind Statistics

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A brief summary of the offshore wind statistics as measured at the FINO 1 platform is given here (for a description of the FINO platform refer to DEWI-Magazine 24-26)¹. Fig. 1 shows the measured wind histogram for the 100m level and the two years period from January 2004 to December 2005. It corresponds very well with the Weibull distribution with parameters $A=11.2$ m/s and $k=2.26$. Therefore a mean wind speed of 9.9 m/s could be observed. In comparison to 2004 alone the measured mean wind speed has increased slightly (2004: 9.8m/s). The distribution of the wind directions is shown in Fig. 2. Only minor changes can be noticed. The contribution from winds from north west has increased within the two years period, compared to 2004. The main wind direction south west is still clearly pronounced.

With the A and k parameters in mind the duration curves of wind speeds can be derived. Fig. 3 shows the duration curve for the whole period in comparison to the 2004 period alone. The frequency of the highest wind speeds above 16m/s has decreased while wind speeds in between 4-8m/s have been detected more often. For more than 2000h a year the rated wind of a wind turbine (12-13m/s) speed is exceeded and for about 8000h a year a wind turbine with cut in wind speed of 4m/s will be in operation.

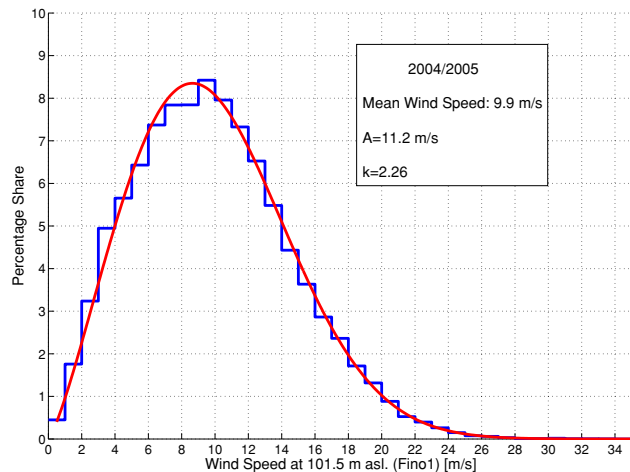


Fig. 1: Measured wind speed distribution and corresponding Weibull curve at the 100m level of the FINO 1 platform

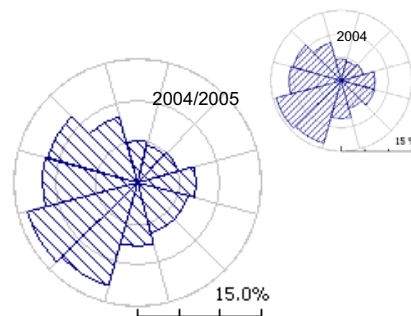


Fig. 2: Distribution of Wind Directions 2004 and 2005

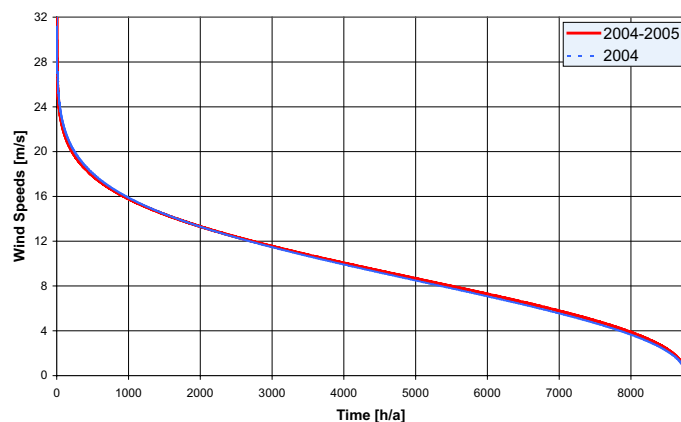


Fig. 3: Measured wind speed duration curve for a period of one year at the 100m-level of FINO 1 platform

Wind speeds (10min average) above 20 m/s can only be detected for about 200h a year with a very small frequency of wind speeds above 25m/s.

This leads to an overall wind power production of more than 4500 full load hours, compared to those achievable on-shore in Germany a factor of two and more higher.

¹ FINO: Research platforms in the North Sea and in the Baltic Sea, GL-Windenergie, Hamburg, on behalf of the German Ministry for the Environment within the framework of the future investment programme of the Federal Government (<http://www.fino-offshore.de>)