

ESMAPBD BDFE2
Data Report WINDCUBEv2 S/N WLS7-598
at the site Feni,
Chittagong District, Bangladesh
for the period from
2018-05-01 to 2018-05-31

2018-06-18


Summary report: SG17010KB16

ESMAPBD BDFE2

Data Report WINDCUBEv2 S/N WLS7-598

at the site Feni, Chittagong District, Bangladesh

Summary report: SG17010KB16

Location or measuring site:	E 91.358190, N 22.800290, Feni, Chittagong District / Bangladesh		
Client:	Suntrace GmbH	Große Elbstraße 145c D-22767 Hamburg	
	On behalf of Worldbank Group	1818 H Street, NW Washington, DC 20433	
Contractor:	windtest grevenbroich gmbh Frimmersdorfer Str. 73a D-41517 Grevenbroich		
Date of order:	2017-09-12	Contract number:	17 0091 09
Auditor:	Editor:		

M.Sc. Liliana Del Angel Bulos
Project manager site assessment

Dipl.-Ing. Florian Schmidt
Project manager site assessment

Grevenbroich, 2018-06-18

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It comprises 11 pages in total, incl. appendices.



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1 Introduction

windtest grevenbroich gmbh (wtg) was instructed by Suntrace GmbH to evaluate the data of the LiDAR wind measurement system at the location Feni. This report only contains the data measured by the LiDAR device ranging from 2018-05-01 until 2018-05-31 at the present site. In parallel an environmental measurement including a small meteorological mast (10 m) is being performed by the customer. The results of these measurements can be taken from a separate report provided by the customer.

2 Measurement statistics

Table 1: Mean measurement values during the evaluation period

Mean Values	Wind speed [m/s]	Wind speed max [m/s]	Wind speed min [m/s]	Wind direction [°]	Weibull A [m/s]	Weibull k []	Availability [%]
40 m	4.98	16.21	0.25	168.1	5.49	2,2050	98.8
60 m	5.71	18.84	0.39	170.6	6.34	2,3527	98.6
80 m	6.13	18.40	0.21	172.6	6.87	2,5390	98.2
100 m	6.40	19.64	0.24	174.4	7.19	2,6353	97.4
110 m	6.52	20.82	0.35	175.5	7.34	2,6712	96.9
120 m	6.62	21.45	0.37	176.5	7.46	2,7203	96.2
130 m	6.72	21.21	0.27	177.7	7.58	2,7427	95.9
140 m	6.81	21.39	0.38	178.6	7.66	2,7535	95.4
150 m	6.89	21.96	0.32	179.6	7.74	2,7691	95.2
160 m	6.97	20.66	0.28	180.6	7.84	2,8284	95.0
180 m	7.15	19.75	0.33	182.5	8.05	2,9631	94.5
200 m	7.28	19.25	0.51	184.4	8.20	2,9736	93.9

Table 2: Availability during the evaluation period

Availability per day [%]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
40 m	91.3	100	99	94	100	100	89	100	100	100	100	100	100	100	90	100	100	100	100	99	100	99	100	100	100	100	100	100	100	99	100	100
60 m	91.3	100	99	93	100	100	89	100	100	100	100	100	100	100	90	100	100	100	100	99	98	99	99	100	100	100	100	100	100	100	99	100
80 m	91.3	100	99	93	100	100	89	100	100	100	100	100	100	100	90	100	99	95	100	99	95	99	96	100	100	100	100	100	100	100	99	99
100 m	91.3	99	98	92	100	100	88	100	100	99	99	100	100	99	90	99	99	90	100	99	92	97	95	99	100	100	100	100	100	99	99	95
110 m	91.3	99	97	92	99	100	87	100	100	94	98	100	99	99	90	99	99	90	100	99	93	95	93	99	100	100	100	100	100	99	98	92
120 m	91.3	98	96	92	99	100	87	99	100	91	97	100	98	97	90	99	99	90	100	99	92	95	90	98	100	100	100	100	100	99	97	91
130 m	91.3	97	96	90	99	100	85	99	100	88	97	100	97	97	90	98	99	90	99	99	91	95	90	98	100	100	100	100	100	99	97	91
140 m	91.3	97	96	90	99	100	84	99	100	88	94	100	96	96	90	96	99	89	99	99	90	94	88	98	100	100	100	100	100	99	97	90
150 m	91.3	96	96	90	99	100	83	99	100	87	92	100	97	96	90	95	99	88	99	99	89	94	88	98	100	100	100	100	100	99	97	90
160 m	91.3	96	96	90	99	100	83	99	100	85	92	100	97	97	90	95	99	88	99	99	90	94	87	97	100	100	100	100	100	99	97	88
180 m	91.3	96	96	90	99	100	82	99	100	85	91	100	94	95	90	94	97	86	99	99	89	94	86	97	100	100	100	100	99	99	97	87
200 m	91.3	96	96	89	97	100	81	99	100	85	90	100	94	94	90	93	97	85	99	99	87	94	85	97	99	100	100	98	96	97	83	



3 Time series

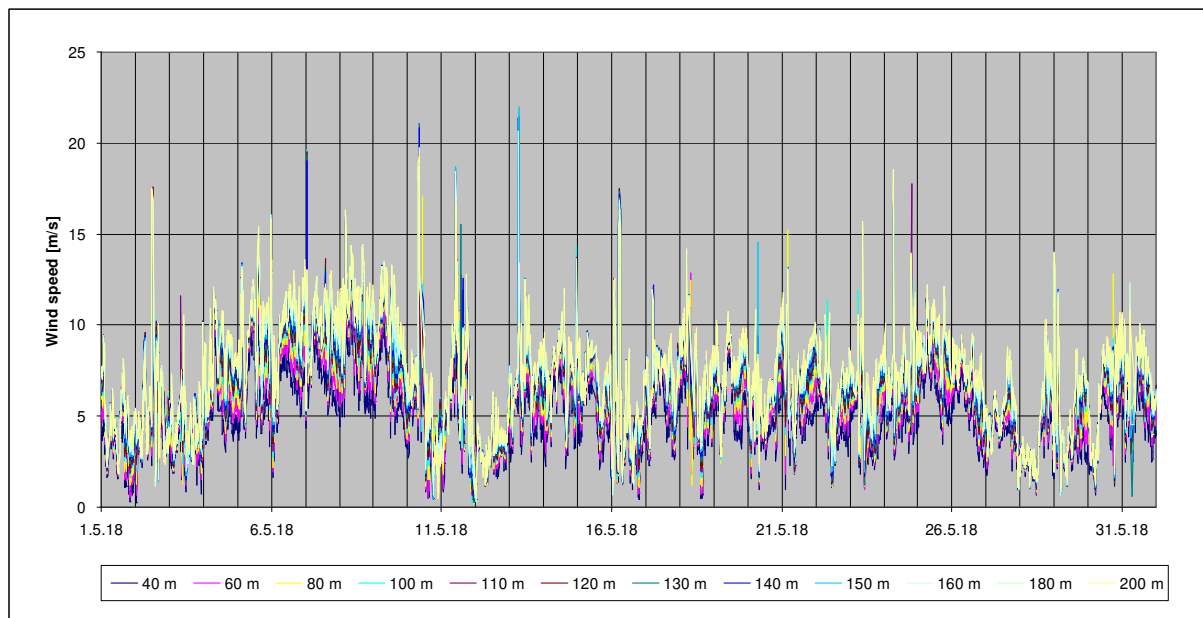


Figure 1: Time series of wind speed during the evaluation period

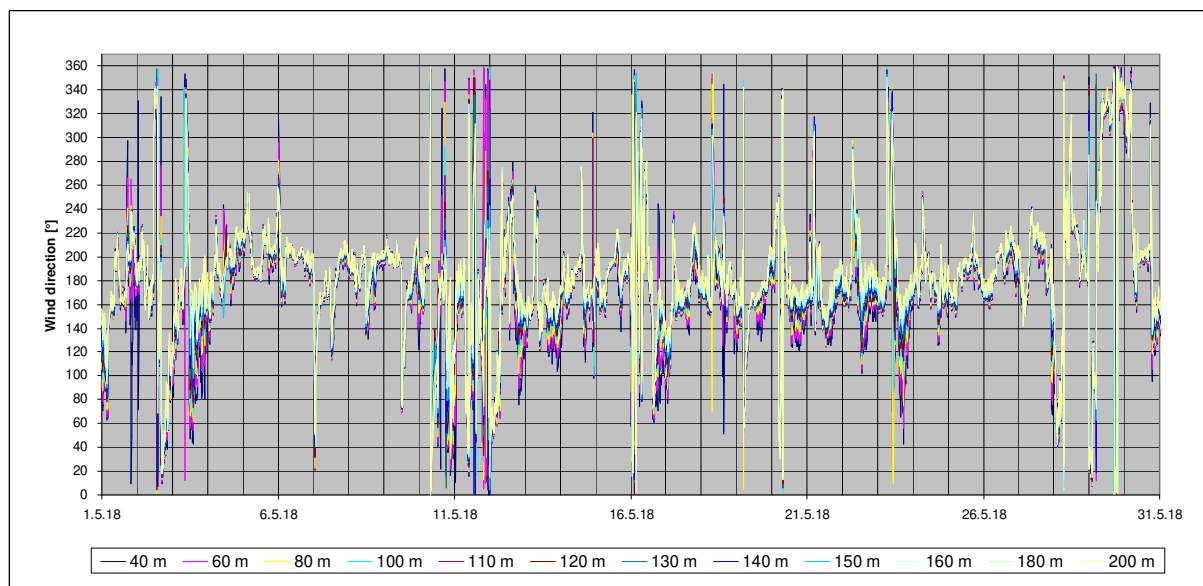


Figure 2: Time series of wind direction during the evaluation period



4 Daily profile

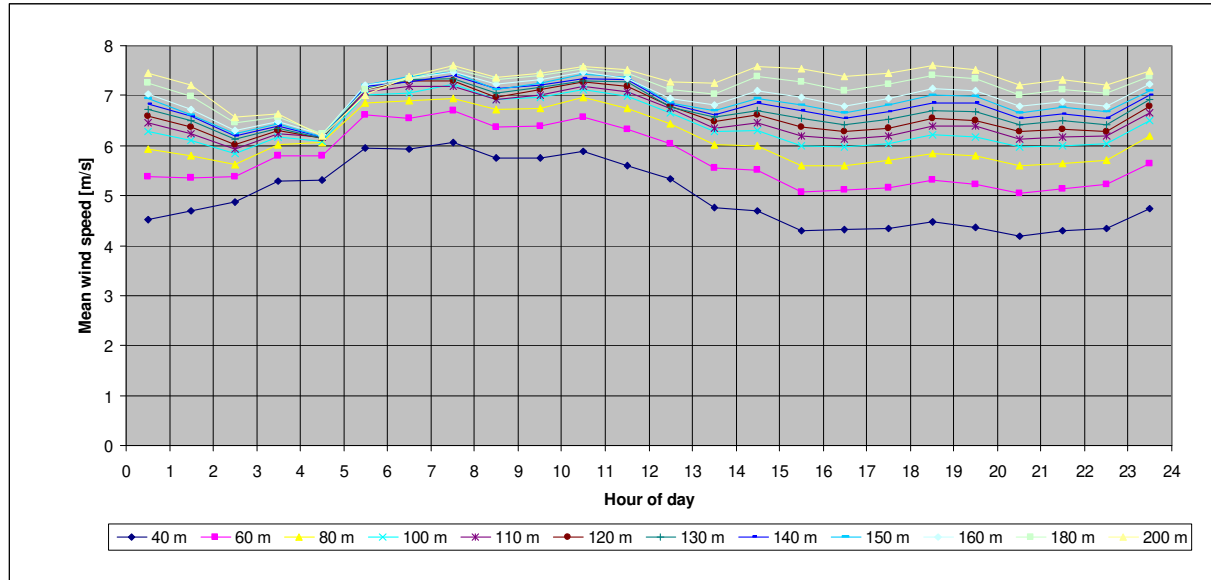


Figure 3: Daily profile of wind speed during the evaluation period

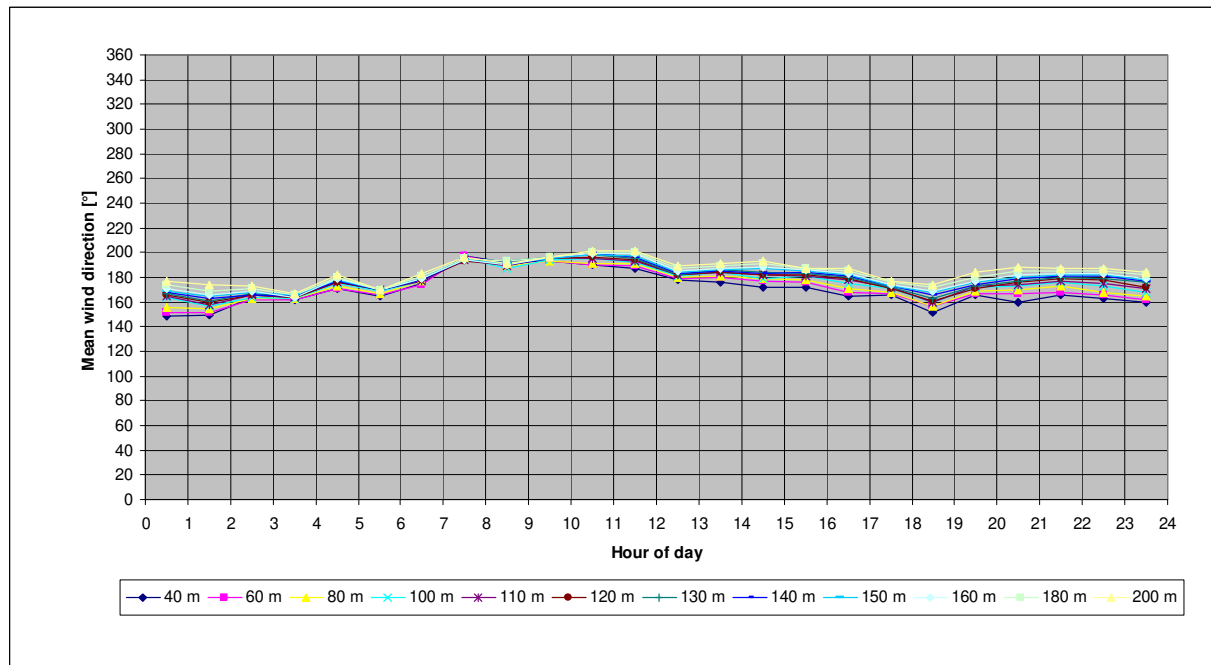


Figure 4: Daily profile of wind direction during the evaluation period



5 Wind direction distribution

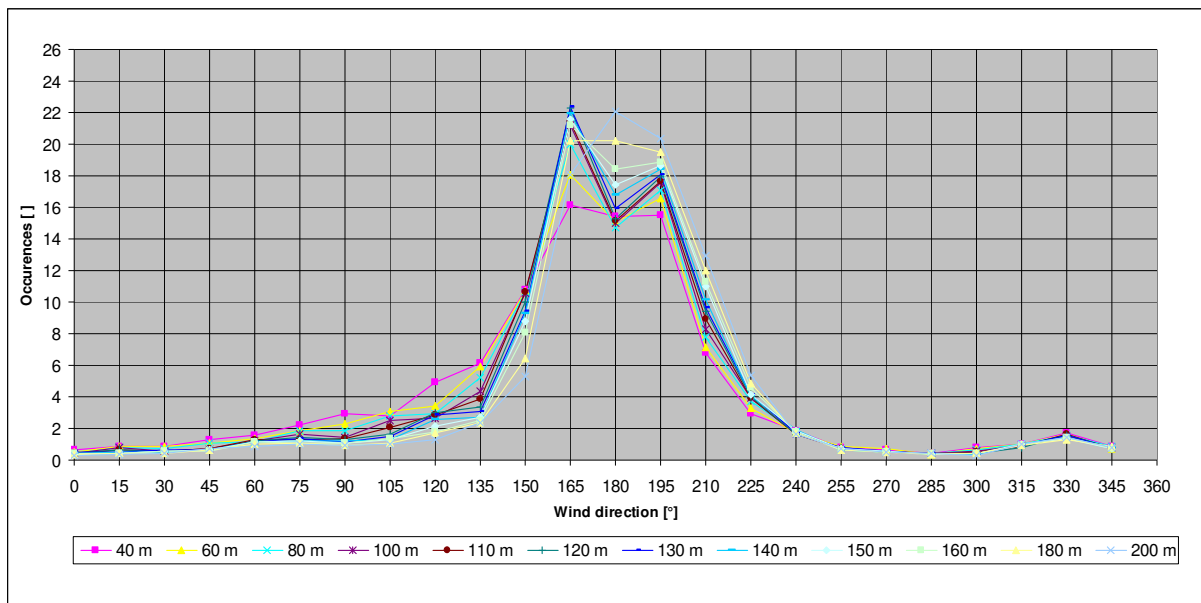


Figure 5: Frequency distribution of wind direction during the evaluation period

6 Natural turbulence

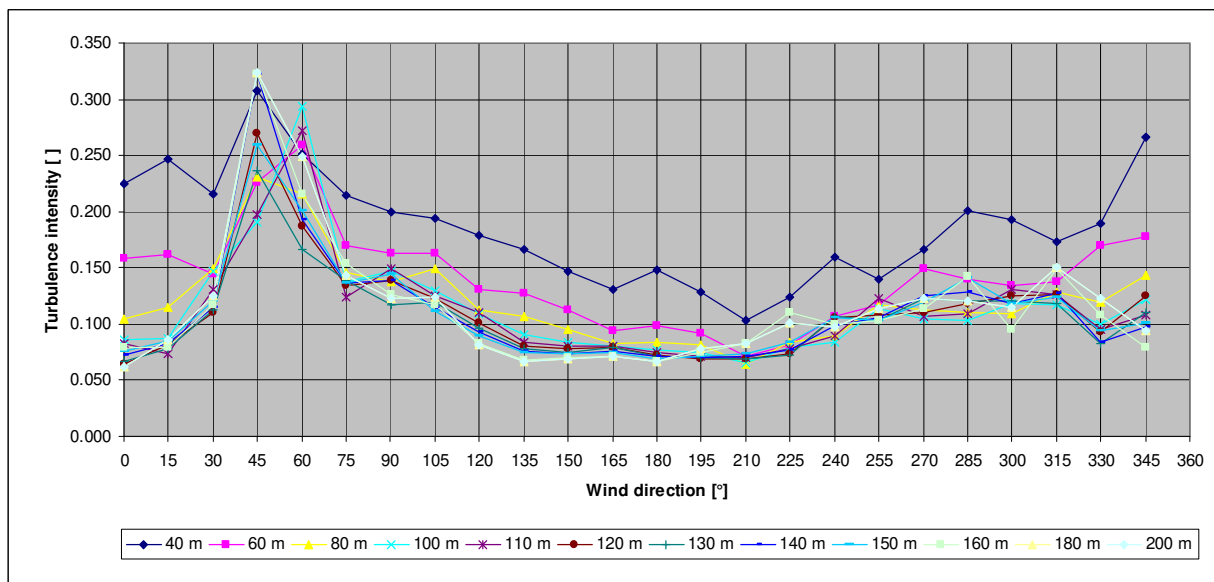


Figure 6: Directional mean turbulence during the evaluation period



7 Wind profile

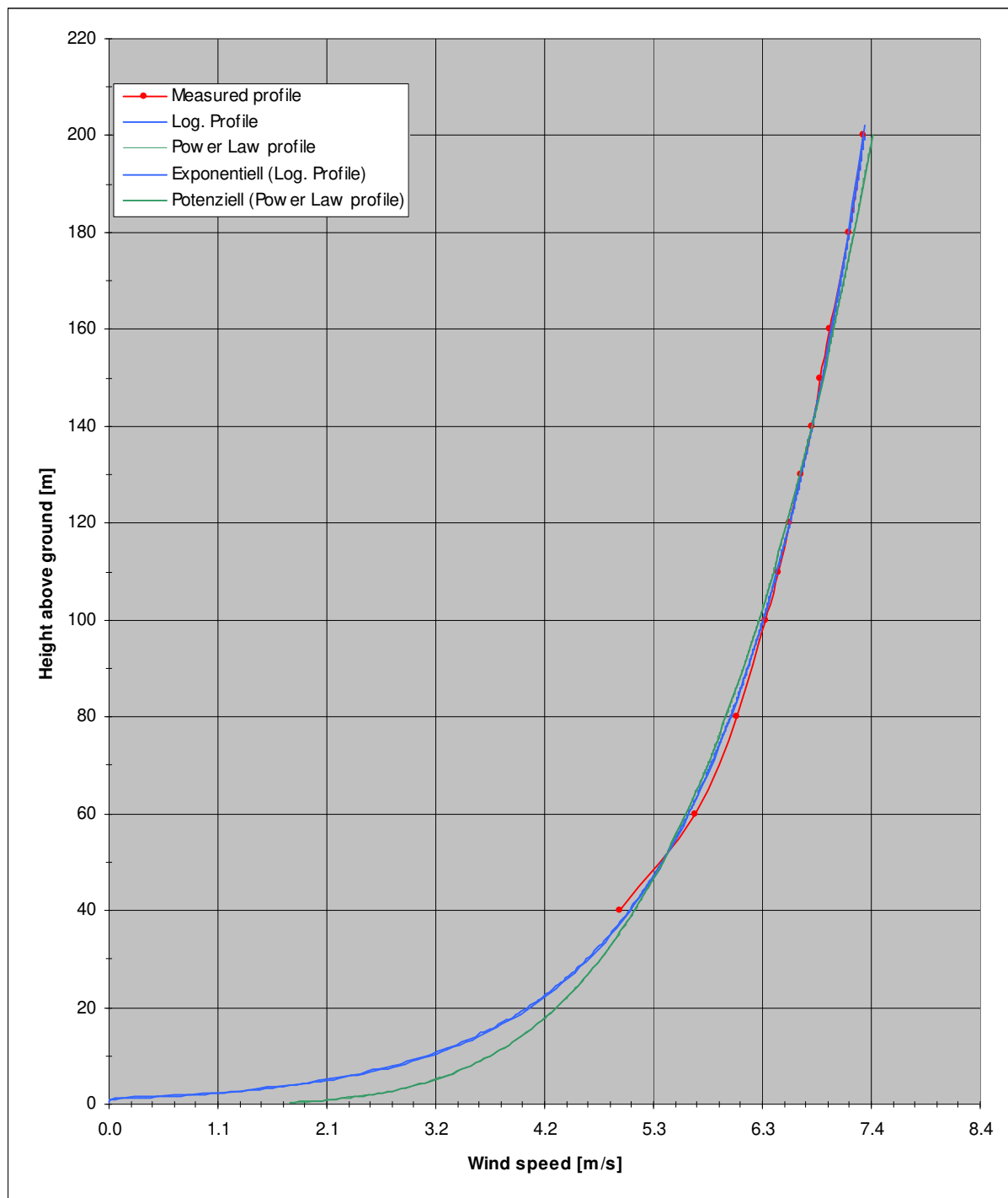


Figure 7: Wind profile during the evaluation period



8 Station Log

Date	Note	Issues
2017-06-04	Installation of LiDAR (Florian Schmidt, wtg) Connection to utility grid due to charger problems with 24 V	frequent restarts
2017-06-15	Manufacturer recommends to turn off LiDAR due to frequent restarts	frequent restarts
2017-06-16	LiDAR disconnected from Grid (Najmul Hossain, EQMS)	LiDAR disconnected
2017-07-27	Installation of DC-AC converter to supply LiDAR (Najmul Hossain, EQMS) LiDAR connected to power supply Performance check via remote connection (Florian Schmidt, wtg)	-
2017-07-28	Performance check via remote connection (Florian Schmidt, wtg)	-
2017-07-31	Data and performance check (Florian Schmidt, wtg) No connection to LiDAR	According to sent data, most likely no present LiDAR issues
2017-08-08	Data connection restored Data and performance check (Florian Schmidt, wtg)	-
2017-09-05	No connection to LiDAR	According to sent data, most likely no present LiDAR issues
2017-09-09	Data connection restored Data and performance check (Florian Schmidt, wtg)	-
2017-12-04	No connection to LiDAR	According to sent data, most likely no present LiDAR issues
2017-12-05	Data connection restored Data and performance check (Florian Schmidt, wtg)	-
2018-01-02	No connection to LiDAR	According to sent data, most likely no present LiDAR issues
2018-01-03	Data connection restored Data and performance check (Florian Schmidt, wtg)	-
2018-01-30	No connection to LiDAR	According to sent data, most likely no present LiDAR issues
2018-02-06	Data connection restored Data and performance check (Florian Schmidt, wtg)	-
2018-05-01	LiDAR shut down (02:20 - 02:30) LiDAR shut down (04:30 - 06:10)	No power supply / Low solar radiation due to heavy rain
2018-05-04	LiDAR shut down (10:50 - 12:10)	No power supply / Low solar radiation due to heavy rain
2018-05-07	LiDAR shut down (02:10 - 03:20) LiDAR shut down (11:20 - 12:30)	No power supply / Low solar radiation due to heavy rain
2018-05-15	LiDAR shut down (10:30 - 12:40)	No power supply / Low solar radiation due to heavy rain

Note: Weekly and other frequently performed checks as well as data backup will not be listed in the station log.



We hereby affirm that the evaluation was performed in accordance with the latest state of the art, impartially and to the best of our knowledge and belief.

Grevenbroich. 2018-06-18



Dipl.-Ing. Florian Schmidt
Project Manager



9 Appendix

9.1 Processing

Version	Date	Content
SG17010B1	2017-04-25	Verification of the remote sensing device type Leosphere WINDCUBE v2 S/N WLS7-598 performed at the verification station Grevenbroich
SG17010B2	2017-06-22	Installation of the Remote Sensing Device Type Leosphere WINDCUBE v2 S/N WLS7-598 at the site Feni
SG17010KB1	2017-08-31	ESMAPBD BDFE2 Cumulative Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni
SG17010KB2	2017-09-11	ESMAPBD BDFE2 Cumulative Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni
SG17010KB3	2017-10-06	ESMAPBD BDFE2 Cumulative Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni
SG17010KB4	2017-11-08	ESMAPBD BDFE2 Cumulative Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni
SG17010KB5	2017-12-18	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-11-01 to 2017-11-30
SG17010KB6	2018-01-17	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-12-01 to 2017-12-31
SG17010KB7	2018-03-02	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2018-01-01 to 2018-01-31
SG17010KB8	2018-03-02	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2018-02-01 to 2018-02-30
SG17010KB9	2018-04-13	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-06-01 to 2017-06-30
SG17010KB10	2018-04-13	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-07-01 to 2017-07-31
SG17010KB11	2018-04-13	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2018-03-01 to 2018-03-31
SG17010KB12	2018-05-24	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-08-01 to 2017-08-31
SG17010KB13	2018-05-24	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-09-01 to 2017-09-30
SG17010KB14	2018-05-24	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2017-10-01 to 2017-09-31
SG17010KB15	2018-05-24	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2018-04-01 to 2018-04-30
SG17010KB16	2018-06-06	ESMAPBD BDFE2 Data Report WINDCUBEv2 S/N WLS7-598 at the site Feni for the period 2018-05-01 to 2018-05-31

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