

**ESMAPBD BDFE2**  
**Data Report WINDCUBEv2 S/N WLS7-598**  
**at the site Feni,**  
**Chittagong District, Bangladesh**  
**for the period from**  
**2017-12-01 to 2017-12-31**

**2018-01-17**

**Summary report: SG17010KB6**


# ESMAPBD BDFE2

## Data Report WINDCUBEv2 S/N WLS7-598

### at the site Feni, Chittagong District, Bangladesh

Summary report: SG17010KB6

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

<b>Editor:</b>
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Dipl.-Ing. Florian Schmidt  
Project manager site assessment

Grevenbroich, 2018-01-17

This summary may only be copied in extracts with the written consent of windtest grevenbroich gmbh.  
It comprises 10 pages in total, incl. appendices.



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## 1 Introduction

The 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 2017-11-01 until 2017-11-30 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

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	3,3	11,0	0,2	7,1	3,7	3,1	99,9
60 m	3,8	13,2	0,1	9,3	4,3	2,7	99,6
80 m	4,1	14,2	0,2	10,4	0,0	0,0	98,4
100 m	4,3	14,8	0,2	11,0	4,8	2,3	97,2
110 m	4,3	15,0	0,2	11,0	4,9	2,3	96,4
120 m	4,4	15,3	0,2	10,9	4,9	2,2	95,8
130 m	4,4	15,4	0,2	10,6	5,0	2,2	95,3
140 m	4,4	15,6	0,2	10,4	5,0	2,2	94,7
150 m	4,4	15,6	0,2	10,1	5,0	2,2	94,2
160 m	4,4	15,7	0,1	10,0	5,0	2,1	94,0
180 m	4,4	15,8	0,1	9,3	5,0	2,1	93,1
200 m	4,4	15,9	0,1	8,6	5,0	2,1	92,2

Table 1: Mean measurement values 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	99,3	100	100	100	100	100	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
60 m	99,3	100	100	100	100	100	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	100	100	100
80 m	98,6	100	100	100	100	100	100	100	100	99	100	100	100	100	100	100	100	95	95	90	99	100	99	100	100	100	100	83	91	100	100
100 m	99,3	100	100	100	100	100	100	97	100	98	100	100	100	100	100	100	94	92	86	86	93	100	99	100	100	100	100	79	91	100	100
110 m	99,3	100	100	100	100	100	100	94	99	98	100	100	100	100	100	100	92	91	83	78	89	100	99	100	100	100	99	78	90	100	100
120 m	99,3	100	100	100	100	100	100	92	97	98	100	100	100	100	100	100	88	90	81	74	88	100	99	100	100	100	99	76	90	100	100
130 m	98,6	100	100	100	100	100	100	90	94	98	100	100	100	100	100	100	88	90	78	72	85	100	99	100	100	100	98	75	90	100	100
140 m	97,9	100	100	100	100	100	100	86	92	97	100	100	100	100	100	100	87	87	74	71	84	100	99	100	100	100	97	74	90	100	100
150 m	96,5	100	100	100	100	100	100	83	89	95	100	100	100	100	100	100	86	84	73	69	83	100	99	100	100	100	97	74	90	100	100
160 m	96,5	100	100	100	100	100	100	82	88	95	99	100	100	100	100	100	86	83	72	69	83	100	99	100	100	100	97	74	90	100	100
180 m	93,8	100	100	100	100	100	100	72	85	90	97	100	100	100	100	100	86	83	70	67	83	100	99	100	100	100	97	74	90	100	100
200 m	93,1	100	100	100	100	100	100	69	83	88	95	99	100	100	100	100	86	78	69	66	83	100	99	100	100	100	97	73	90	89	100

Table 2: Availability during the evaluation period



### 3 Time series

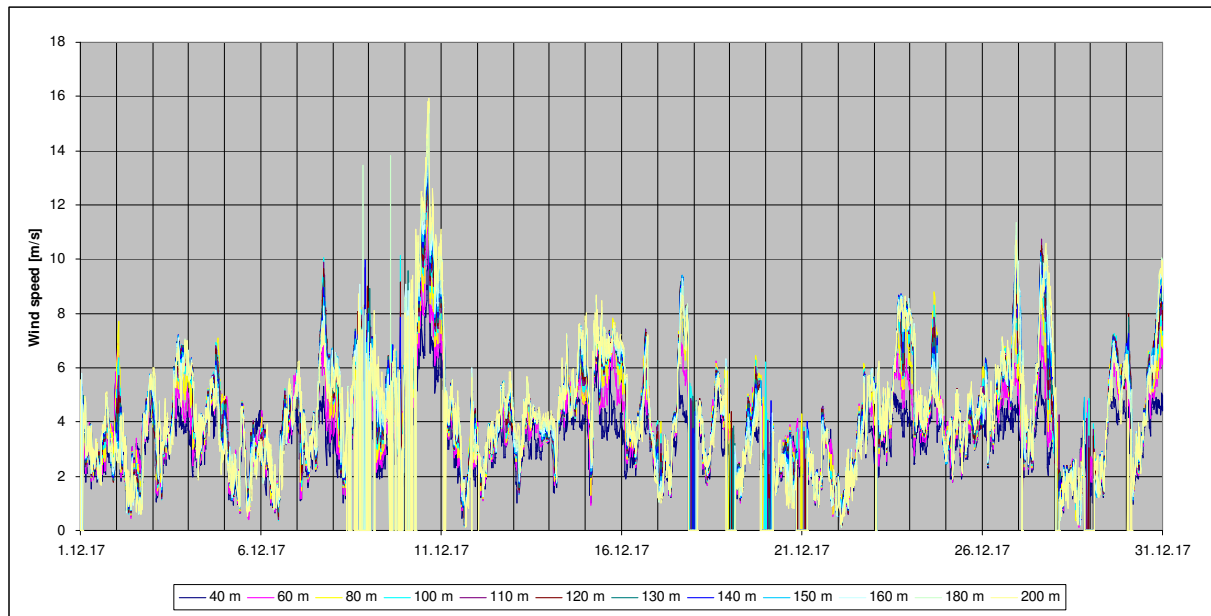


Figure 1: Time series of wind speed during the evaluation period

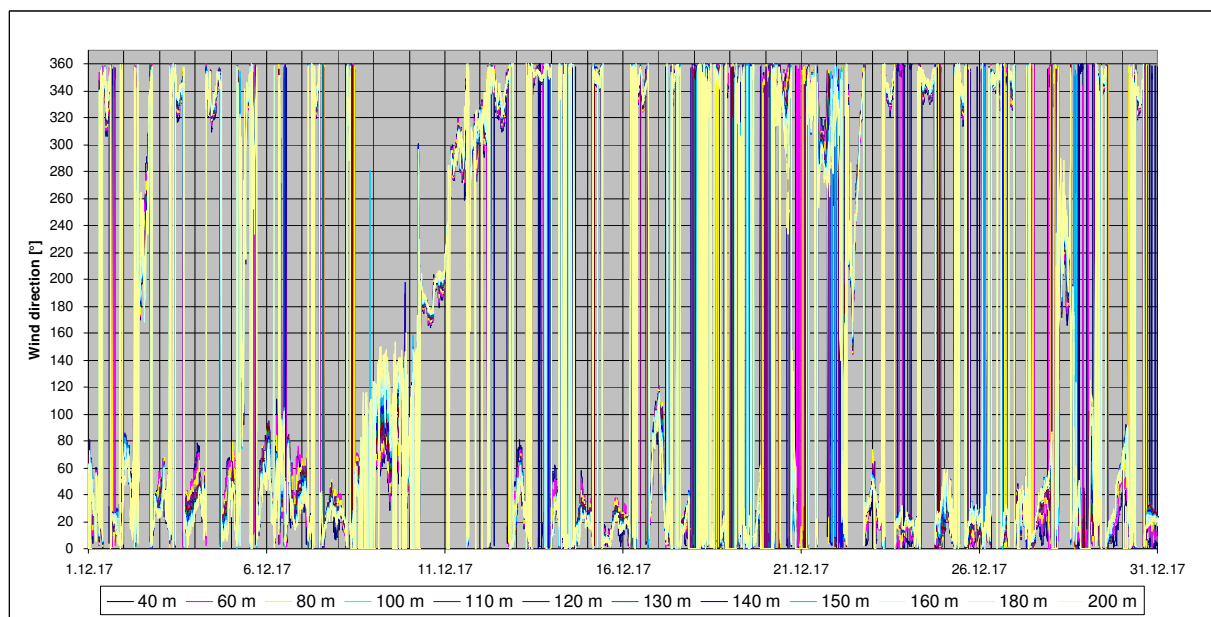


Figure 2: Time series of wind direction during the evaluation period



## 4 Daily profile

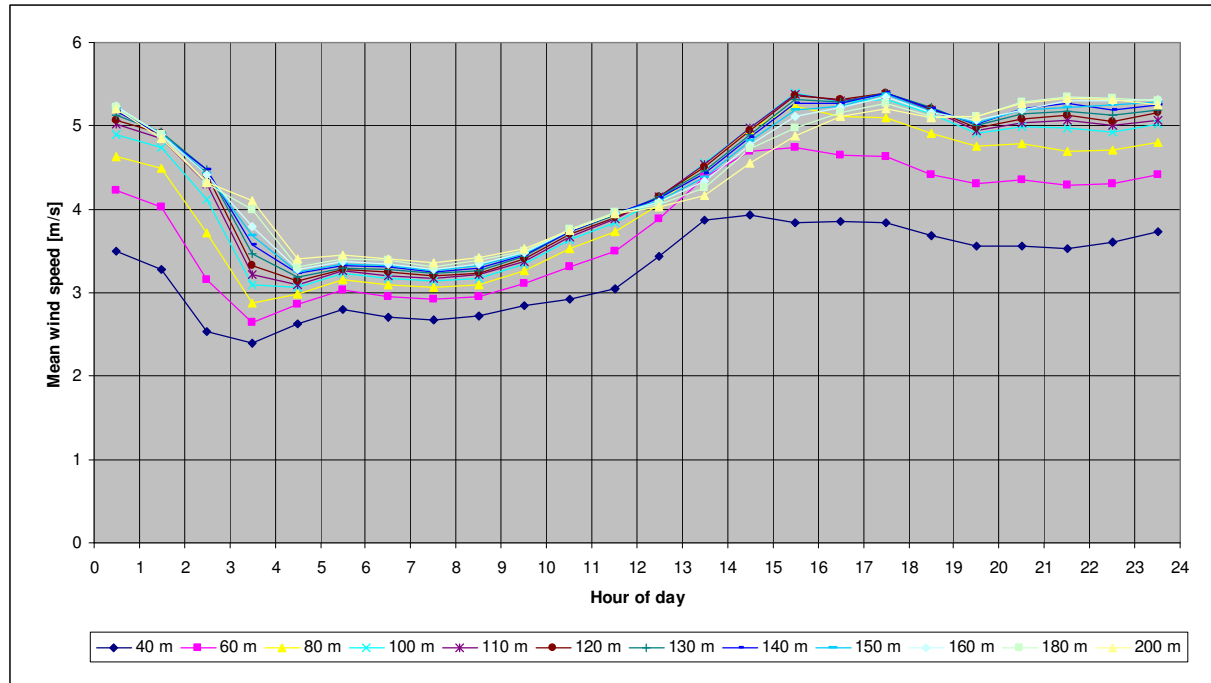


Figure 3: Daily profile of wind speed during the evaluation period

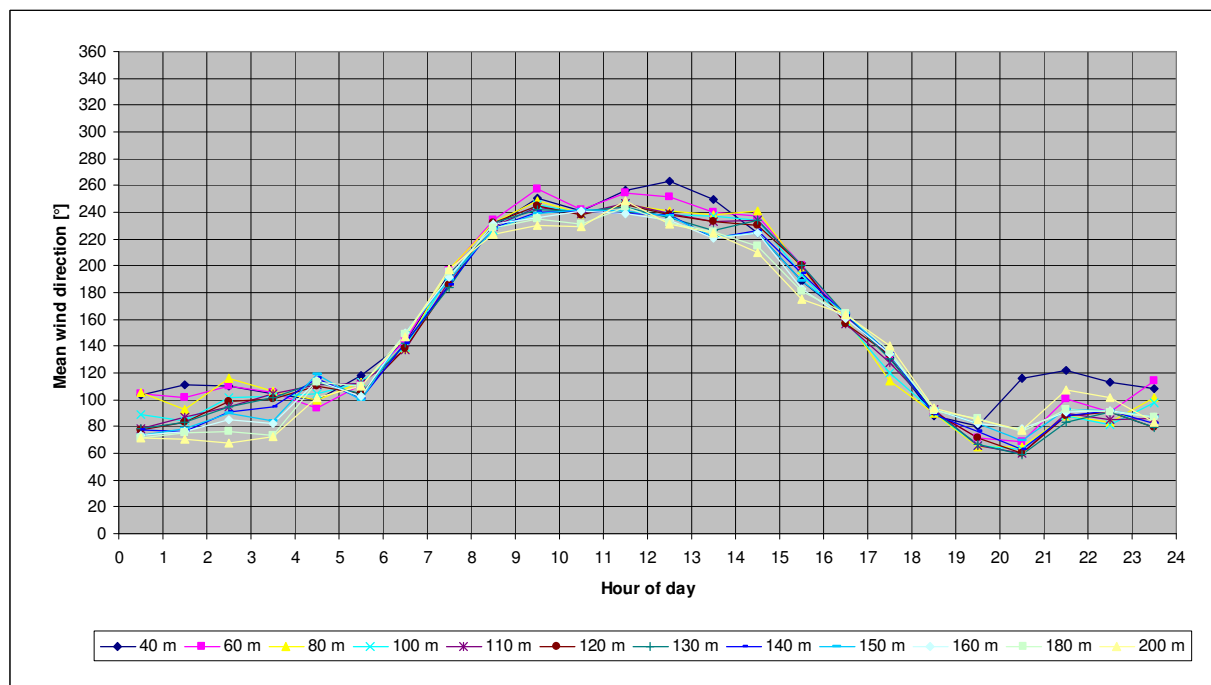


Figure 4: Daily profile of wind direction during the evaluation period



## 5 Wind direction distribution

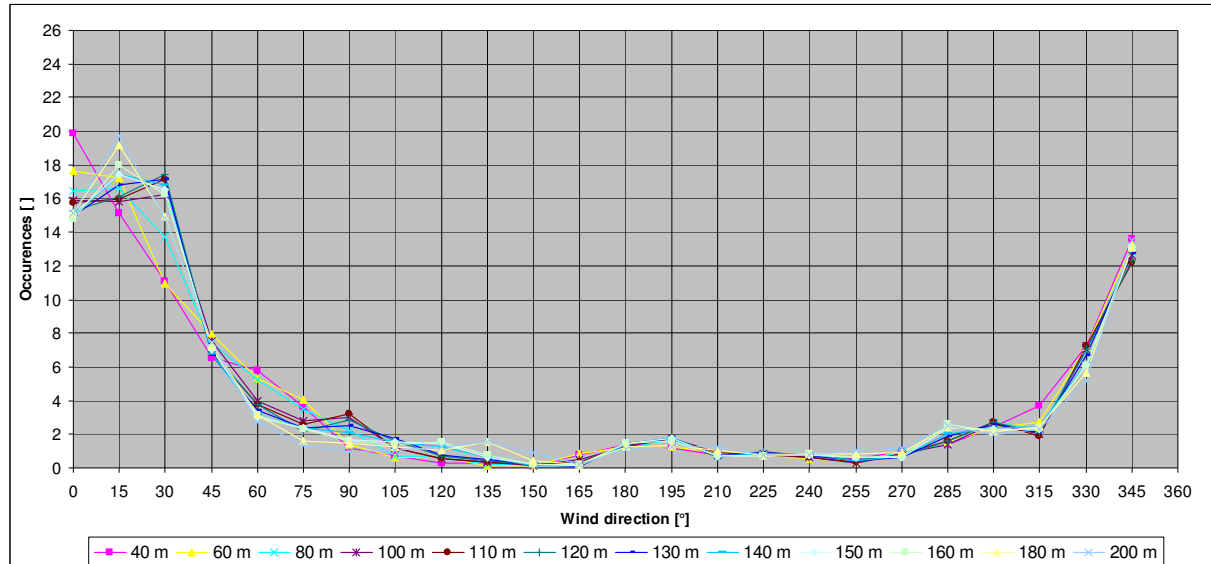


Figure 5: Frequency distribution of wind direction during the evaluation period

## 6 Natural turbulence

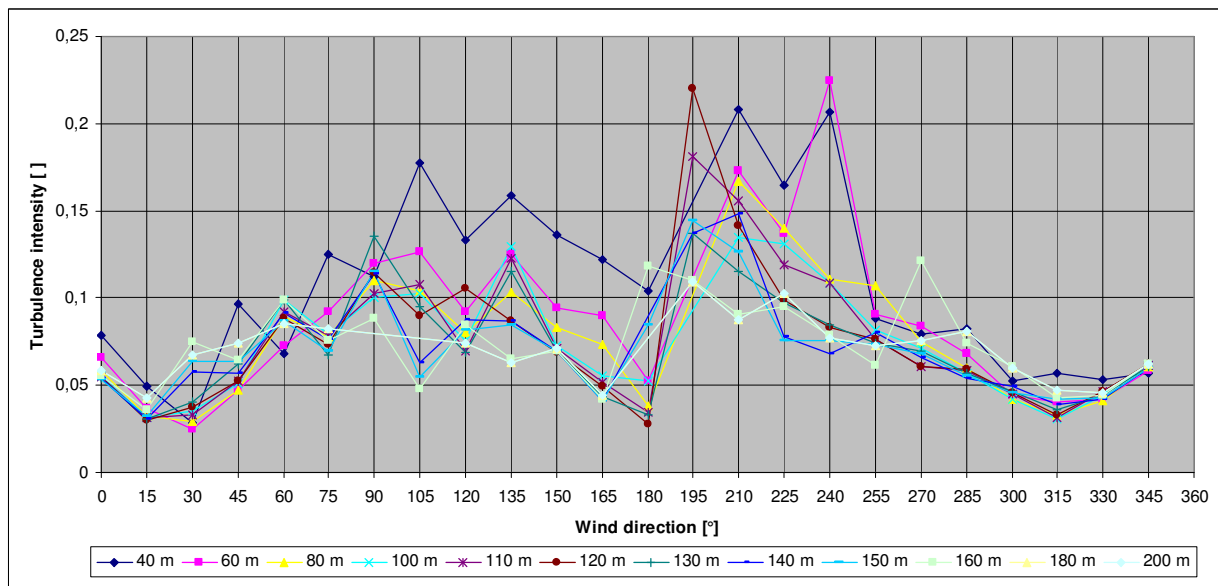


Figure 6: Directional mean turbulence during the evaluation period



## 7 Wind profile

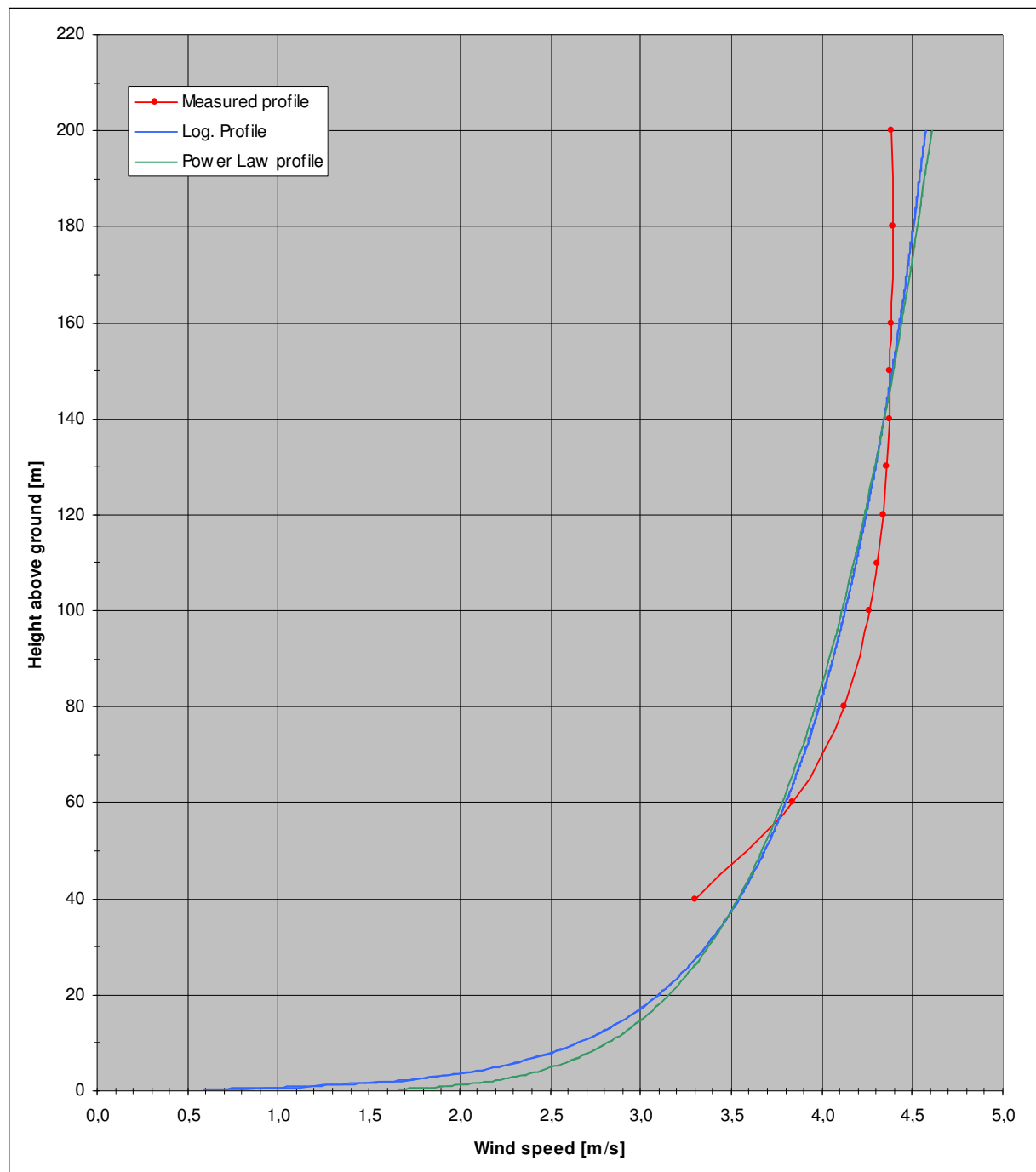


Figure 7: Wind profile and wind distribution during the evaluation period





## 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)	-

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, 2018-01-17

  
Dipl.-Ing. Florian Schmidt  
Project Manager





## 9 Appendix

### 9.1 Processing

<b>Version</b>	<b>Date</b>	<b>Content</b>
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

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