

Technical University of Denmark



IRPWind ScanFlow Public database

Wagenaar, J.W.; Hasager, Charlotte Bay; Bergman, G.; Mikkelsen, Torben Krogh; Alting, I.; Angelou, Nikolas; Pedersen, Claus Brian Munk

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Wagenaar, J. W., Hasager, C. B., Bergman, G., Mikkelsen, T. K., Alting, . I., Angelou, N., & Pedersen, C. B. M. (2017). IRPWind ScanFlow Public database. Poster session presented at EERA DeepWind 2017, Trondheim, Norway.

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

J.W. Wagenaar¹, C. Hasager², G. Bergman¹, T. Mikkelsen², I. Alting¹,
N. Angelou², C.B.M. Pedersen²

1. ECN, Unit Wind Energy, P.O. Box 1, NL 1755 ZG Petten, Netherlands
2. DTU Wind Energy, Risø campus Frederiksborgvej 399, DK-4000, Roskilde, Denmark

ScanFlow project

ECN and DTU have set-up an extensive measurement campaign at the ECN test site to characterize the wind turbine inflow wind field. The campaign comprises nacelle LiDAR, short range scanning LiDAR, meteorological mast, ground based LiDAR and turbine measurements. It is put up in the framework of IRPWind 1st call for joint projects.

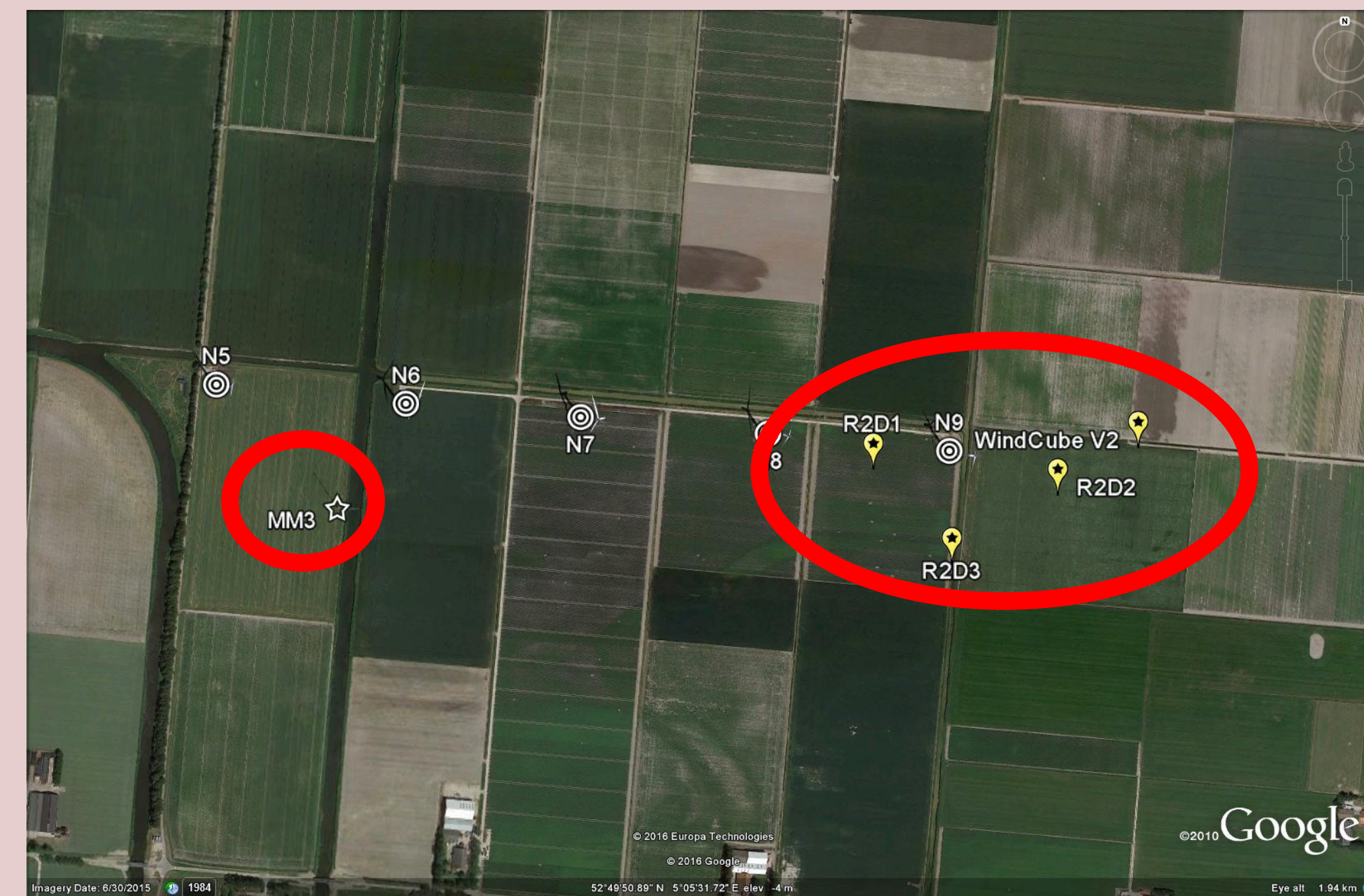
ScanFlow project: "High-resolution full-scale wind field measurements of the ECN's 2.5 MW aerodynamic research wind turbine using DTU's 3D WindScanner and SpinnerLidar for IRPWind's and EERA's benchmark".

Aim: The aim is to establish a unique turbine power performance and induction zone measurement dataset for benchmark purposes.

Key Performance Indicators

- 2 weeks of short-range windscanners (3x)
- 6 weeks of nacelle LiDAR measurements
- 6 weeks of ground based LiDAR, meteorological mast and turbine data
- Public database

Experimental set-up



Layout of the test site with turbine, mast and LiDARs indicated.

ECN Test Site

- 50km North of Amsterdam
- Flat terrain
- 5 research turbines
- West to East line configuration

Turbine (N9):

- 1st from East
- Nordex 2.5MW
- H=D=80m

WindCube V2:

- 2.5D from turbine
- East

IEC mast (MM3):

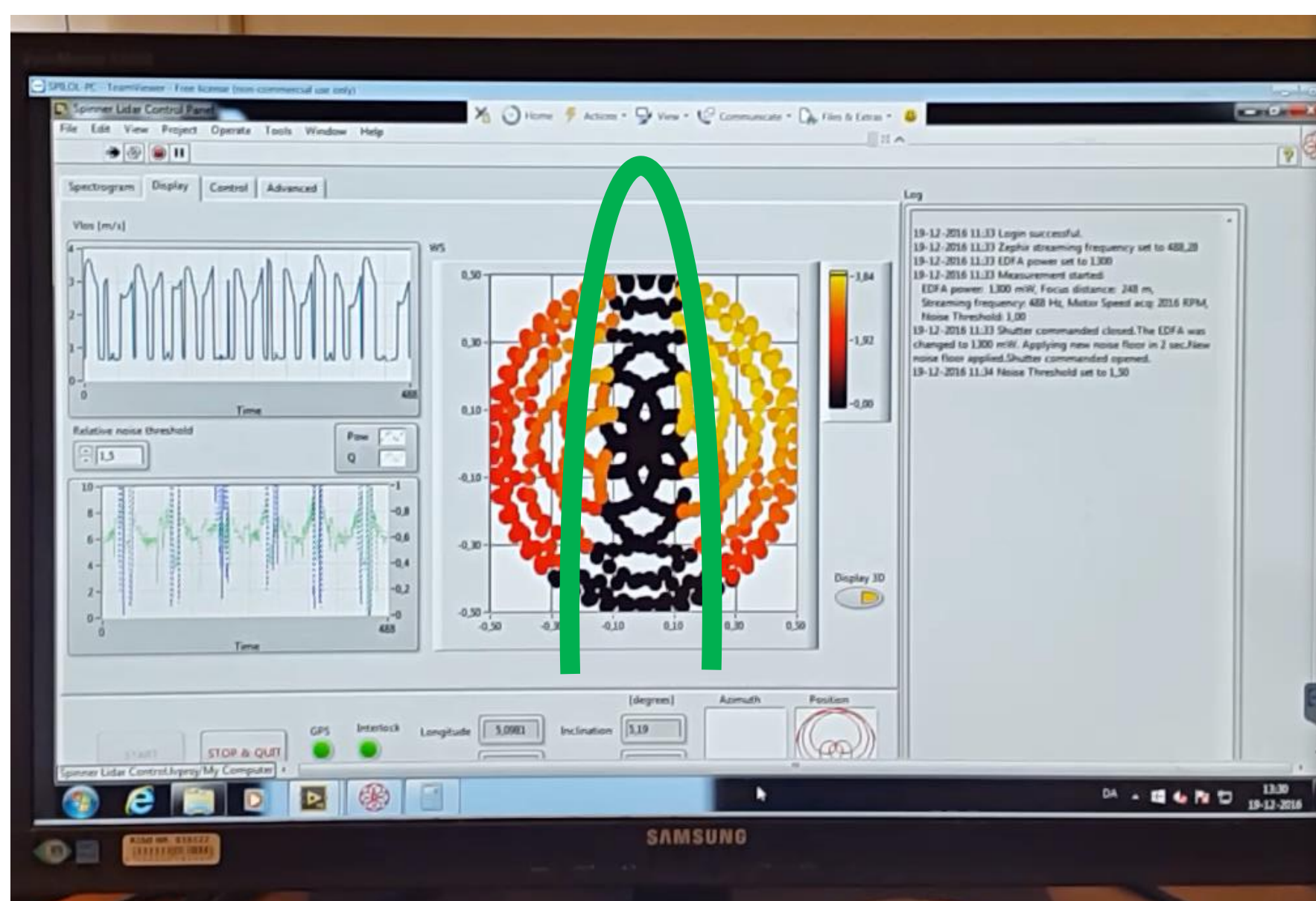
- 1km from turbine
- West
- Ws, wd, T, P, TI, etc.

Nacelle LiDAR:

- Cooler mounted
- Scanpattern
- ~0.8D in front rotor

Short range windscanners:

- R2D1, R2D2, R2D3
- Scanpattern
- ~0.8D in front of rotor



Nacelle LiDAR measurement with blade passage



Nacelle LiDAR installation



Instrumented research turbine



Short range windscanner

Public Database

Data Download Scheme:

1. Registration

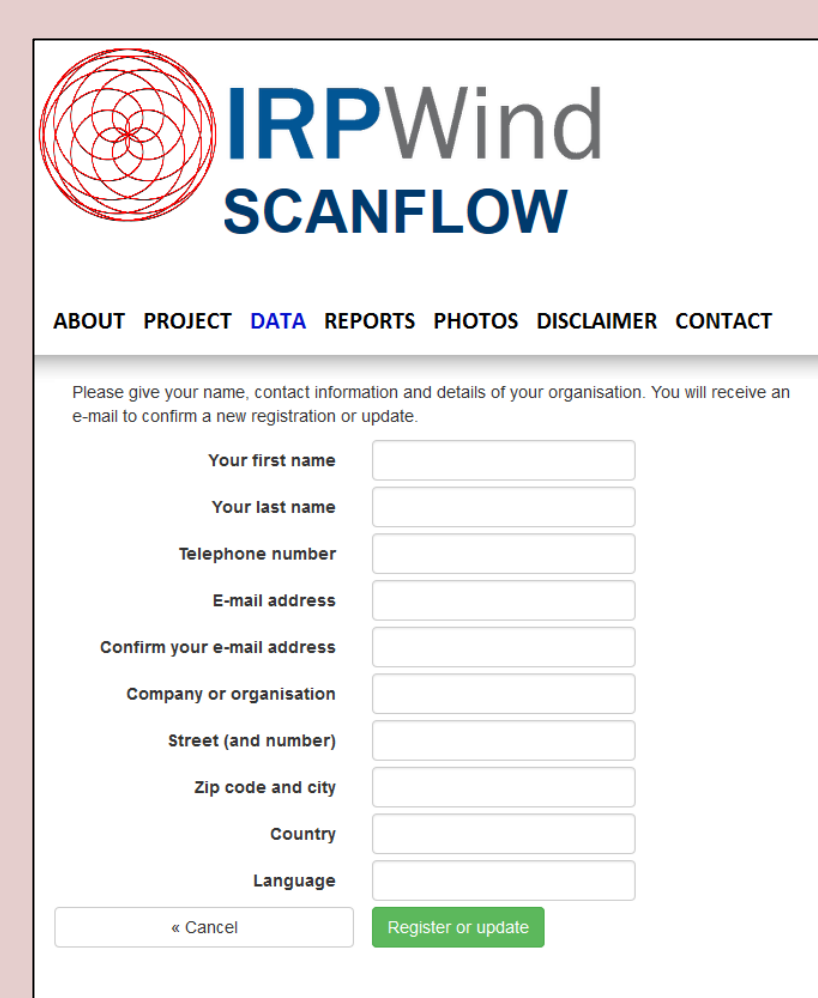
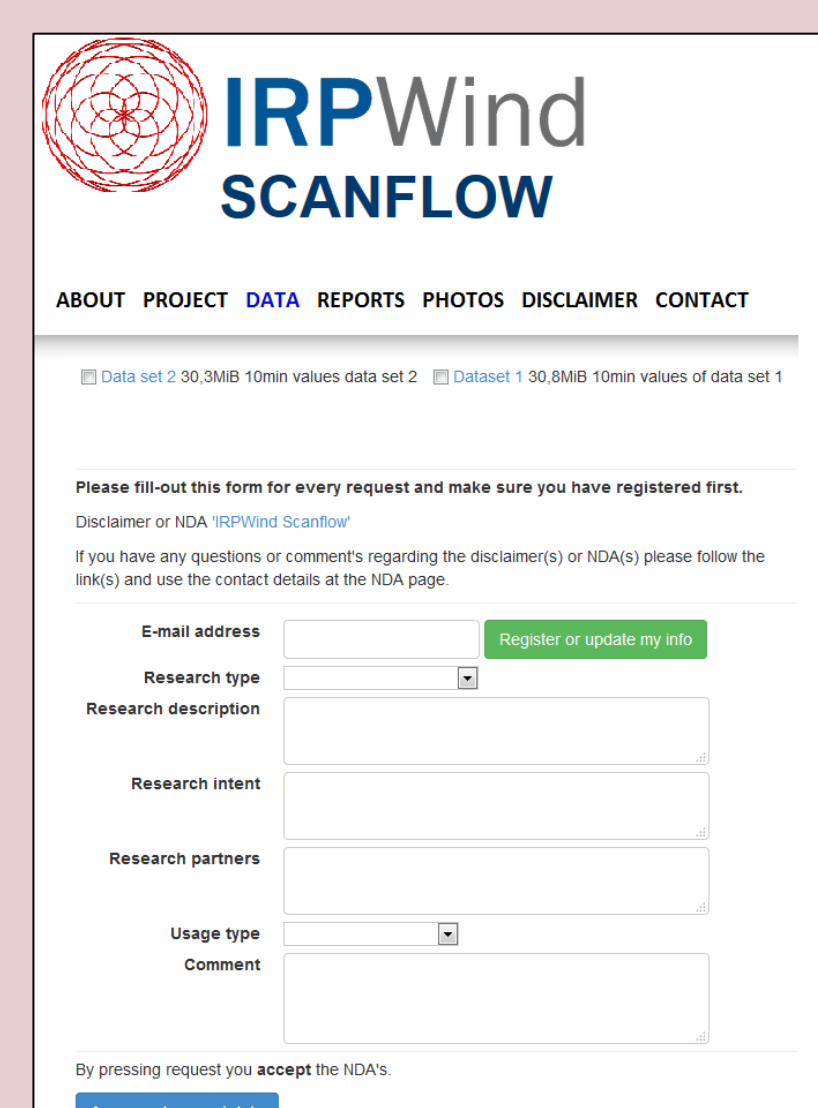
- Go to www.irpwind-scanflow.eu website and click on 'DATA'
- Register as new user
- An email is sent to the new user
- Confirm the registration

2. Data selection

- Go to www.irpwind-scanflow.eu website and click on 'DATA'
- Fill out form and click 'Agree and request data' (the NDA/DISCLAIMER is accepted)
- Data request is being considered

3. Data request evaluation

- The request is being evaluated by the project data maintainer/owner
 - Deny. User receives email with denial motivation
 - Accept. User receives email with a download link, which is temporarily valid
- Download the data

Available data					
MM3	Wind speed 52m, 80m, 108m	Turbine	PLC Yaw		
	Wind direction 52m, 80m, 108m		PLC Power		
WindCube V2	RHT 80m	Short range scanner R2D1	PLC Rotational speed		
	Pressure 80m		Short range scanner R2D2	PLC Status (binary)	
	TI			Short range scanner R2D3	Time
	Horizontal wind speed				X coordinate of a right-handed Cartesian coordinate system.
Vertical wind speed	Y coordinate of a right-handed Cartesian coordinate system.				
Wind direction	Z coordinate of a right-handed Cartesian coordinate system.				
Data availability	Radial wind speed				
40m, 50m, 60m, 70m, 80m, 90m, 100m, 110m, 120m, 130m	U-component wind vector				
Nacelle LiDAR	Time	V-component wind vector			
Index: sample number in scan pattern	W-component wind vector				
LOS velocity	Scan pattern index				
Quality	Quality index velocity estimation				
Power in spectrum	Max power				
Azimuth	Total power Doppler spectrum				
x-component unit vector	# measurements per point				
y-component unit vector	Status				
Focus distance					
Inclination					
ScalingFactor					

Acknowledgements

The work described here has received support from IRPWind, a project that has received funding from the European Union's Seventh Programme for Research, Technological development and Demonstration.

Final Statement

In the ScanFlow project various measurements are being performed to characterize the inflow wind field. These data will publically become available at the end of the project (February 2017) via the website www.irpwind-scanflow.eu. Related websites and important links are www.irpwind.eu, www.windbench.eu and www.windscanner.net.

