

## VindKraftNet :: Forest Workshop

26MAR08, Vattenfall, Fredericia

### Programme

<b>10:15</b>	<b>Welcome and presentation of participants</b>	Jean-François Corbett, Garrad Hassan
10:30	Introduction to roughness and displacement height, practical advice	Lars Landberg, Garrad Hassan
10:50	Wind Flow Over Forested Hills: Mean Flow and Turbulence Characteristics	Peter Stuart, RES
11:10	Forest-added turbulence: A parametric study on Turbulence intensity in and around forests	Henrik S. Pedersen, Suzlon
11:30	Validation of wind resource assessment methodologies including the effects of forests	Shiu-Yeung Hui, DONG Energy
11:50	WASP, CFD and SODAR meet the real world – the frustrating forest	Thomas Sørensen, EMD
12:10	Discussion	Jean-François Corbett, Garrad Hassan
<b>12:30</b>	<b>Lunch</b>	
13:30	Meteodyn's approach to modelling forests, comparison to measurements	Aurélien Chantelot, Meteodyn
13:50	CFD modelling of forest with WindSim, comparison of forest measurements	Tomas Blodau-Konick, Repower
14:10	Shear downwind of a forest edge: comparison of LIDAR measurements, WASP and CFD	Oisin Brady, Natural Power
14:25	Using SCADA, CFD and LIDAR to evaluate the impact of forestry on an operating wind farm	Oisin Brady, Natural Power
<b>14:40</b>	<b>Break</b>	
15:10	Airflow modelling over complex natural landscapes: SCADIS model achievements.	Andrey Sogachev, Risø-DTU;
15:30	Old and new experiments of flow and turbulence over forest	Jakob Mann, Risø-DTU
15:50	Discussion and summary	Jean-François Corbett, Garrad Hassan
16:10	Next VindKraftNet Siting Workshop: Topic? Date? Organiser? Host?	Lars Landberg, Garrad Hassan
<b>16:30</b>	<b>Close</b>	

### List of participants

Shiu-Yeung Hui	DONG Energy
Nina F. Le	DONG Energy
Anton Andersson	e.on
Thomas Sørensen	EMD
Jean-Francois Corbett	Garrad Hassan
Lars Landberg	Garrad Hassan
Aurélien Chantelot	Meteodyn
Oisin Brady	Natural Power

Tomas Blodau-Konick	Repower
Jakob Mann	Risø - DTU
Henrik Sundgaard Pedersen	Suzlon
Jørgen Højstrup	Suzlon
Anders Sommer	Vattenfall
Rasmus Bernsdorf	Vattenfall
Thomas Stalin	Vattenfall
Søren Holm Mogensen	Vestas
Jenny Longworth	Vattenfall
Ian Hunter	RES
Jens Madsen	Vattenfall
Peter Stuart	RES
Andrey Sogachev	Risø DTU
Ulrich Stolz	Vestas

### Quick summary of discussions

*What would the turbine manufacturers require form measurements in forests, can the measurements be done away with completely?*

Nobody recommended not using on-site data! It was noted that the investment cost of the mast(s) in many cases were insignificant in relation to the total investment of the wind farm. There are many practical issues when installing masts, but that is another issue.

Manufacturers: there is no doubt that it is the turbulence that kills the turbines, not the mean wind speed.

*What kind of tapering off is used as you go away from the forest?*

Note that this is not a physical thing once you get outside of the forest.

Numbers used: 1:5, 1:15, 1:20

*How to handle the IBL generated by the forest?*

RES shifts the height of the boundary-layer, not the height of the IBL.

*Which height is it actually that is seen in the SRTM data?*

It depends on the density of the forest, but it seems to be between the height of the ground and the top of the trees. Very site-dependent.

*Has anybody tried using airborne measurements of forest height and density?*

Natural Power has some limited experience, and DONG has used it for buildings (a database for DK exists).

*What is the difference between a small forest and an "infinite" forest?*

The agreement was that the physical effects were taken into account by the various models.

Some groups do not use displacement height, rather a very high roughness (7 m!), in WAsP this seems also to give good results.

**Needs identified**

The variation of wind speed with height, especially when crossing the IBL

**Next meeting**

At DONG Copenhagen, Topic: Wakes , Date: September 2008, Organiser: GH

/LL 26MAR08