

## INTRODUCTION TO METEOROLOGY

**Date: 29 October 2010**

**Course location: Stockholm, Sweden**

### TRAINING FROM THE EXPERTS IN WIND ENERGY

GL Garrad Hassan offers professional training courses developed in-house, which are delivered by experienced trainers, who have the support of GL Garrad Hassan's unparalleled experience in the wind industry.

#### Introduction to Meteorology

A one day course for industry professionals who wish to acquire a comprehensive overview of the subject and have the meteorological basics, weather systems, and atmospheric modelling clearly explained. Wind power meteorology, the atmospheric structure and scales are also covered.

#### Course background

GL Garrad Hassan has acted as the technical adviser for more than 21,000MW of operational wind projects, and assessed the energy yield of over 80,000MW. In undertaking these tasks, GL Garrad Hassan has advised on more wind farm developments than any other company in the world.

This course offers an introduction to meteorology, with application to wind energy in mind. The course will cover a description of the atmospheric circulation, the structure of the atmosphere, and its various scales. Typical large systems as the low pressure system, monsoons and hurricanes will then be described. In the afternoon the modelling of the atmosphere will be discussed, and finally, the most important aspects of wind power meteorology will be described, these include: local effects, variations on different scales, "strange animals in the micro-scale zoo" like complex terrain, forestry, wind profiles, and thermally-driven winds. A questions and answers session will close the day.



#### Who should attend?

Wind resource analysts, project managers, developers, civil and structural designers, lenders, turbine designers and other professionals who wish to benefit from GL Garrad Hassan's technical and commercial knowledge of the meteorological aspects of wind power developments. GL Garrad Hassan has assumed that attendees will have a technical background, but no specific meteorological knowledge is required.

**Course location:** Stockholm, Sweden

**Cost:** €525 exc VAT

#### Registration Contact Details

Andrew Brown for general enquiries.

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For a booking form, please go to:

[www.gl-garradhassan.com/en/Training.php](http://www.gl-garradhassan.com/en/Training.php)





## Programme<sup>1</sup>

**09:00**      **Coffee and registration**

**09:30**      Why does the wind blow?

Structure of the atmosphere: the atmospheric engine, escape velocity, the layers of the atmosphere, the greenhouse effect, albedo

Atmospheric Scales: global, synoptic, meso, micro

**10:45 - 11:15**      **Coffee**

The low-pressure system

The monsoons, tropical cyclones, hurricanes

Atmospheric Variables: velocity (wind), pressure, temperature, humidity, density, stability

**12:30 - 13:30**      **Lunch**

Modelling the atmosphere: global circulation models, numerical weather prediction, chaos, ensemble predictions

Climate change

Wind power meteorology:

- Distributions
- Variation: diurnal, seasonal, inter-annual variation
- Local effects: roughness, orography, obstacles
- Strange animals in the zoo: complex terrain, forestry, wind profiles, ana-/katabatic winds, icing
- Extreme winds/turbulence
- Off-shore
- Instruments we use
- CFD & Meso-scale modelling

**15:00 - 15:30**      **Coffee**

Wind power meteorology, continued

Q&A session

**17:00**      **Finish**

<sup>1</sup>Subject to change