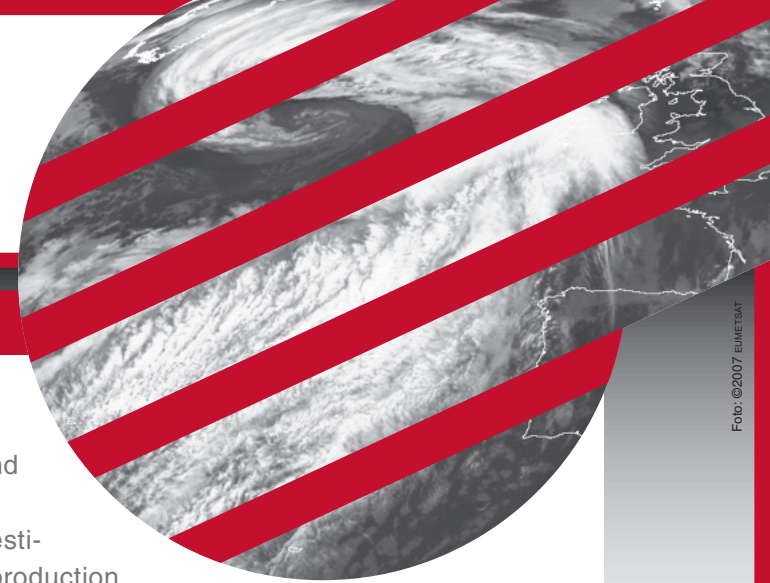


## Wind Atlas



### EWIS

Being one of the leading institutes on wind energy research, ECN established the EWIS (ECN Wind Industrial Support) group in 2009 to better bring the R&D results to the market. During the last three decades, ECN has developed expertise on aerodynamics, structural analyses, turbine control, offshore operation and maintenance, and grid connection. With the growing wind industry, ECN received more requests for assistance and EWIS has become the vehicle to support the wind energy industry in their product developments.

EWIS's focus is on the high end of the market which means that we will make use of tools and knowledge that have been developed in-house and include the latest R&D results!

The EWIS team is a mixture of young professionals and experienced researchers which ensures a fast response and high quality.

#### More information

ECN Wind Industrial Support  
P.O. Box 1, 1755 ZG Petten, The Netherlands  
tel. +31 (0)224 564115  
fax +31 (0)224 568214  
e-mail: [ewis@ecn.nl](mailto:ewis@ecn.nl)  
[www.ewis.nl](http://www.ewis.nl)

### Description of service

#### The Service

The wind speed at turbine hub height is the primary parameter that determines the energy production of a wind turbine. Maps with the average wind speed at heights between 60 and 150 meter contain information for a rough estimate of the average energy production. For the realistic production estimate required in site selection more detailed information is needed: the distribution of the wind speed and the wind direction and the distributions of the turbulence intensity and of the stability class. Wind turbine or wind farm design warrant even more detailed information in the form of time series of 10-minute averaged wind speed, wind direction, turbulence intensity and stability class.

#### The Approach

In order to analyse the wind conditions at a site in the Dutch part of the North Sea, also known as the Netherlands Exclusive Economic Zone (NEEZ), ECN uses a three-step approach.

In the **first step** a rough and rapid wind speed estimate is obtained by inspecting:

- Four mean wind speed maps. Each map shows the mean wind speed at 60, 90, 120 or 150 meter height in the period 1997-2002 in intervals of 0.2 m/s.
- A spreadsheet with four mean wind speed tables. Each table in this spreadsheet contains the mean wind speed at 60, 90, 120 or 150 meter height in the period 1997-2002 at a 0.05 x 0.05 degree<sup>2</sup> geographic grid.

In the more detailed **second step** a spreadsheet with five wind resource tables is employed. Each table in this spreadsheet contains the distributions of the wind speed and the wind direction (at 60, 90, 120 and 150 meter height), the turbulence intensity and the stability class in the year 2002 in a location that is characteristic for the wind resource in a larger region.

## Offshore Wind Atlas

Maps and spreadsheets € 5 000

## Wind time series

One year of data, per location

- First year € 500
- Next years € 250

(Prices valid until 31 December 2010)

In the even more detailed **third step**, which is not limited to the Dutch part of the North Sea, a time series of 10, 15 or 60-minute wind speed, wind direction, turbulence intensity and stability class is created for a given geographical location and height. This time series is created by processing data from ECN's HiRLAM database (2001 - current), and subsequently is post-processed in order to obtain sectorwise distributions of the Weibull parameters, turbulence intensity and stability class.

## The Experience

Wind conditions have been analysed by using the three-step method since the year 2005. This work includes studies on:

- Wind resource assessment for wind farm developers.
- Variability of wind energy in the Dutch power system.
- Correlation between wind power and energy price.

For more information about this service,  
please contact:

dr.ir. Arno J. Brand  
tel. +31 (0)224 564775  
e-mail: brand@ecn.nl