



Project Profile: Wieringermeer, Netherlands

Project name:	Wieringermeer
Owner:	ECN (Energy research Centre of the Netherlands)
Contractors:	ECN Wind turbine Testpark Wieringermeer CV
Power utility:	Nuon
Installed capacity:	12.5 MW.
Wind turbine type:	N80/2500 kW
Tower height and type:	80 m. tubular tower.
Number of wind turbines:	5
Wind speed:	7.6 m/s
Site:	The site is located on ECN'S test field near Wieringermeer.
Site description:	Agricultural landscape
Wind turbine siting:	Online configuration facing East – West. Internal distance between the turbines: 300 meters
Building Period:	Winter/ Spring 2004
Grid connection:	March 2004
Extent of delivery:	Nordex was responsible for the supply and the commissioning of the turbines, the foundation works as well as the transformers and the supervision of the installation and of the maintenance
Calculated annual power output:	32,000,000 kWh
Maintenance:	Nordex Energy GmbH
Warranty period:	5 years

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In spring 2004, Nordex has installed five N80/2,500 kW wind turbines for the Dutch research institute ECN (Energy research Centre of the Netherlands) on its new test field near Wieringermeer. The project included the installation and maintenance for the first five years of operation.

ECN is one of the leading international research institutes in the wind power segment and is committed to basic research in the interests of encouraging the wide-spread use of environment-friendly wind power. To this end it focuses on large turbines of manufacturers who are willing to cooperate in the research programs of ECN. This was one of the key reasons for its decision to order the N80.

After 1,500 hours of operation Nordex handed over the turbines to the customer in summer 2004. Wim Stam, managing director of the site, stated in a first interim result: "Up to now the N80 turbines on our site show a good performance and meet our expectations".

ECN uses the turbines for intensive testing in order to support research and development programmes. In these programmes items as control strategies and energy yield optimization are being addressed.

„The Nordex monitoring system works well and gives us useful information about the status and performance of the turbines. We have to analyse the accuracy of availability data and energy production. In general terms wind turbine manufacturers have the tendency to overestimate both types of data somewhat. Based on our results to date Nordex could be an exception“, says Stam.

The group Experiments of ECN Wind Energy comprise:

- power performance measurements, including energy output estimation
- monitoring of wind turbine power quality: harmonic effects, voltage fluctuations, flicker, reactive power, et cetera
- mechanical load measurements for design and certification purposes or more specific analysis of dynamic behaviour
- vibration measurements
- noise measurements
- large scale turbine measuring and testing
- resource assessments
- an extensive collection of meteorological data,
- bird collision registration using the WT-Bird system
- supply of data acquisition system dedicated for wind energy application called DANTE.

Beside of the research activities, ECN also benefits from the electricity produced by feeding it into the public grid. Given an average wind speed of 7.6 m/s at an altitude of 80 meters, the five turbines are able to produce roughly 32 million kilowatt/hours of electricity each year, sufficient to cover the electricity requirements of some 8,000 households.

