



## Project Profile: Havøygavlen Wind Farm, Norway

Project name:	Havøygavlen Wind Park
Owner:	Arctic Wind A/S
Contractors:	NCC & Alstom
Power utility:	Repvåg Kraftlag
Installed capacity:	40 MW
Wind turbine type:	N80/2500 kW
Tower height and type:	80 m. tubular tower
Number of wind turbines:	16
Wind speed:	9.5 m/s
Site:	Havøygavlen is located only about 100 kilometres south of the North Cape in Northern Norway
Site description:	The 16 wind turbines are placed in 2 parallel rows. The distance between each wind turbine is approximately 400 metres
Wind turbine siting:	The wind turbines are situated on an headland, 200 – 250 metres above Havøysund.
Building Period:	April – October 2002
Grid connection:	October 2002
Extent of delivery:	Turnkey project
Calculated annual power output:	120,000,000 kWh
Maintenance:	Nordex Energy GmbH
Warranty period:	5 years

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Located only about 100 kilometres south of the North Cape, Havøygavlen is the world's northernmost wind park. In April 2002 Nordex commenced the construction of this ambitious project consisting of 16 N80/2500 kW turbines.

The customer is Arctic Wind owned by Norway's largest industrial group Norsk Hydro, the Dutch utility Nuon and the original owners/developers Norsk Miljøkraft. The "Havøygavlen" wind park is one of the best locations for wind in Europe. At the Havøygavlen site the N80 turbine demonstrates its high economic efficiency. With an average wind speed of more than 9 m/s in the hub height of 80 metres, the wind park has a capacity of 40 megawatts generating up to 120 GWh of clean electricity per year.



Despite this northern location, the wind turbines were not equipped with the cold climate version, as the temperatures in the area are quite moderate: only at rare times the temperatures go down below minus 26°C and the N80 standard version is able to operate under these conditions. Also, the wind turbines are not protected against the salt from the sea, as the wind turbines are situated 200 – 250 metres above Havøysund.

On the other hand, the turbines are equipped with Nordex' proprietary "Power Crane System" developed for offshore units. An on-board crane can assemble a heavy-duty mobile "Power Crane" on the basic frame of the turbine. This Power Crane is able to lift independently replace all the main components such as the blades and the gear box. A further advantage of this solution is that only a single Power Crane is required for each wind farm, thus allowing the customer to cut costs without sacrificing service quality.



Nordex has already constructed several wind parks for Nuon in the past, so the Havøygavlen contract confirms the quality of the Nordex wind turbines.

„Havøygavlen“ is Norway's largest wind park to date and the project has enabled Nordex to enter a new and interesting market, offering a total potential of some 1,000 megawatts over the next years. On the other hand, „Havøygavlen“ is Norsk Hydro's first wind power project. Depending on the success of the project, the company plans to develop further wind parks in the future.



The towers were shipped from Århus Harbour, Denmark



The N80s erected on the beautiful site in Havøygavlen.