

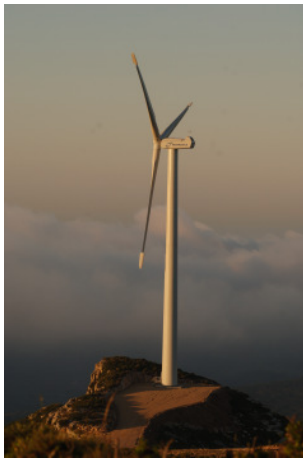


Project Profile: Tortosa, Spain

Project name:	Tortosa
Owner:	EYRA (Energía y Recursos Ambientales)
Contractor:	EYRA
Installed capacity:	48,1 MW
Wind turbine type:	N62/1300 kW
Tower height and type:	60 m turbular tower
Number of wind turbines:	37
Wind speed:	8.4 m/s
Site:	The turbines are located in a small coastal mountain range close to the small town Tortosa, about 200 km south of Barcelona.
Site description:	Medium wind speeds mark this coastal site situated in 500 to 640 m height.
Building period::	September 2005 – March 2006
Grid connection:	Beginning of April 2006
Extent of delivery:	Turbines only
Calculated annual power output:	around 116,500 kWh
Maintenance:	Nordex Energy GmbH
Warranty period:	2 years

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In spring 2006, Nordex constructed a wind farm comprising 37 N62 turbines in the coastal mountain range close to the town of Tortosa about 200 kilometers south of Barcelona. This was the largest project which Nordex had completed for the Spanish market to date and posed considerable logistic challenges. Almost 6,340 tons comprising towers, machine houses, rotor blades and related equipment had to be transported from one end of Europe to the other by water and road.



In order to avoid any disruptions to construction work, Nordex devised a system to ensure just-in-time delivery of the components required.



The tower sections were carried by ship from Denmark to a fishing port around 25 kilometers away from Tortosa with access to the necessary mobile crane capacity. At the same time, the machine houses were transported one after the other on heavy-duty trucks from the Rostock factory to Spain. The 111 29-meter blades were transported by road over a distance of 1,400 kilometers from Ponferrada to Tortosa.

One new element of the logistics, however, was the use of a commission stock warehouse in Germany for the ancillary equipment. The suppliers delivered their products directly to this "central collection point". The logistic department in Norderstedt sent single trailers with 18 tons of components for each system and dispatched in a precisely timed sequence to ensure that the rotor blades from Spain, the machine house from Rostock and the main components arrived in Tortosa at the same time.

Finally, there was another obstacle to overcome at the site: the final 16 kilometers of the way to Tortosa lead over dirt roads with inclinations of up to 16 percent. This was impossible for trucks designed for long-distance hauls on motorways. Accordingly, a special tractor was available on site for this extremely difficult route to bring the turbines safely and reliably to their final destinations at the wind farm.

Nordex completed the project in time and on budget. Accordingly, the model proved itself. This structured logistics solution will be able to guarantee customers on-schedule completion for projects with similar volumes anywhere in Europe.

